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Prosperity Game: Advanced Manufacturing Day, May 17, 1994

Marshall Berman

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Prosperity Game

ADVANCED MANUFACTURING DAY
Albuquerque Convention Center, Ruidoso Room
Tuesday, May 17, 1994

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ABSTRACT

Prosperity Games are an outgrowth and adaptation of move/countermove and seminar War Games. Prosperity Games are simulations that explore complex issues in a variety of areas including economics, politics, sociology, environment, education and research. These issues can be examined from a variety of perspectives ranging from a global, macroeconomic and geopolitical viewpoint down to the details of customer/supplier/market interactions in specific industries. All Prosperity Games are unique in that both the game format and the player contributions vary from game to game.

This report documents a 90-minute Prosperity Game conducted as part of Advanced Manufacturing Day on May 17, 1994. This was the fourth game conducted under the direction of the Center for National Industrial Alliances at Sandia. Although previous games lasted from one to two days, this abbreviated game produced interesting and important results. Most of the strategies proposed in previous games were reiterated here. These included policy changes in international trade, tax laws, the legal system, and the educational system. Government support of new technologies was encouraged as well as government-industry partnerships. The importance of language in international trade was an original contribution of this game.

The deliberations and recommendations of these teams provide valuable insights as to the views of this diverse group of decision makers concerning policy changes, foreign competition, and the development, delivery and commercialization of new technologies.

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EXECUTIVE SUMMARY

As part of Advanced Manufacturing Day, a 90-minute Prosperity Game was conducted on May 17, 1994. This was the fourth game conducted under the direction of the Center for National Industrial Alliances at Sandia. Although previous games lasted from one to two days, this abbreviated game produced interesting and important results.

Most of the strategies for improving economic competitiveness proposed in previous games were reiterated here. These strategies included policy changes in international trade, tax laws, the legal system, and the educational system. Government support of new technologies was encouraged, both as a guaranteed buyer and a supporter of R&D. Government/industry partnerships were encouraged.

Initially the Blue (US) teams seemed confident and not overly concerned with global competitiveness. As in earlier games, seeing the Purple (Japan) strategies tended to stimulate thinking and the development of more specific strategies.

The teams representing Japan were confident of the economic superiority of their systems. They disparaged most US systems except universities and laboratories, which were considered exploitable sources of open information and talented workers. They believed that the initial strategies proposed by the Blue (US) teams would be ineffective.

The switch in identities between Blue and Purple was very stimulating, especially to the Purple teams. Their previous foreign role appeared to convince them of the seriousness of the problem, and the need for major changes in the US in foreign trade, business management, manufacturing, tax and liability laws, and partnering between government, industry, universities and laboratories.

All teams recognized the crucial role played by the educational system

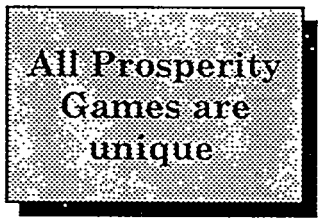
All four teams recognized the crucial role played by the educational system in training the workforce. However, a completely new idea arose in three of the four teams; i.e., the importance of language in international economic competition. Language differences could be used to simultaneously exploit US openness in English publications, technical conferences and business interactions, while maintaining product and technology secrecy in Japanese language publications. With both cooperative and secretive motives, the teams recommended teaching languages in elementary school, rewarding multilingual capabilities in schools and business, and developing better translating machines.

Language is important in international economic competition

The surprise identity switching proved to be a very stimulating event. Being forced to view the situation from the other country's point of view increased interest, creativity, and a heightened sense of urgency. The complacency demonstrated in earlier games was severely shaken by this forced change in perspective.

INTRODUCTION

Prosperity Games are an outgrowth and adaptation of move/countermove and seminar War Games. Prosperity Games are simulations that explore complex issues in a variety of areas including economics, politics, sociology, environment, education and research. These issues can be examined from a variety of perspectives ranging from a global, macroeconomic and geopolitical viewpoint down to the details of customer/supplier/market interactions in specific industries. All Prosperity Games are unique in that both the game format and the player contributions vary from game to game. Two of the three previous games have been documented in SANDIA reports.[1,2]



This report documents the Prosperity Game conducted as part of Advanced Manufacturing Day, hosted by Sandia National Laboratories on May 17, 1994, at the Albuquerque Convention Center in Albuquerque, New Mexico. Advanced Manufacturing Day was held in conjunction with the Ideas in Science and Electronics (ISE) 1994 16th annual Electronics Exposition and Symposium. Of the total of 18 players, 14 were drawn from industry, 2 from Sandia, and one each from the University of New Mexico and local government.

GAME OBJECTIVES

The primary game objective was to develop strategies to improve US global manufacturing competitiveness in the production of consumer electronics goods. The strategies should be aimed at simultaneously accomplishing the following four goals: 1. Increase standard of living and quality of life; 2. Increase domestic production of electronics together with generating high quality jobs; 3. Increase worker productivity; and 4. Increase profitability of domestic electronics manufacturing companies.

As in the previous games, this game attempted to simulate real life situations. This simulation process is designed to fulfill several purposes, including: stimulating thinking; facilitating the development of synergistic relationships among the players and their constituencies; develop a better understanding of the roles and relationships among the various groups; explore long-term planning; and lay the foundation for a roadmap to economic competitiveness.

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[1]M. Berman and J. P. VanDevender, "Prosperity Games Prototyping with the Board of Governors of the Electronic Industries Association, January 20-21, 1994," SAND94-0841, August 1994.

[2]M. Berman and J. P. VanDevender, "Prosperity Games Prototyping with the American Electronics Association, March 8-9, 1994," SAND94-1710, August 1994.

PROSPERITY GAME DESCRIPTION

This game began with the assumption that the US standard of living was falling, the trade deficit was increasing, and that almost all electronics manufacturing had moved offshore. The US was losing its competitive position and this was posing a threat to the economic health of the country and its national security. The President forms a high-level commission (represented by two Blue teams) to propose strategies to improve competitiveness. A particular foreign country learns of this US commission, and forms its own group (represented by two Purple teams) to counter any Blue strategies.

The US was losing its competitive position

A surprise element was injected into this game. Prior to the last round, the Blue and Purple teams were asked to change places; i.e., their perspectives now shifted to the opposite country. This change energized both groups who had already become quite comfortable with and confident in their previous "winning strategies." [This same comfort had been observed in the two previous games.[1,2]]

Prior to the game, the players were given a summary description of the game, Appendix A. This summary briefly described the game objective and schedule, and provided a suggested list of possible Blue and Purple strategies to use as starting points for deliberation. These strategies were compiled from previous games. A white paper on flat panel displays was also provided as an example of a particular product or technology that the teams might focus on, Appendix B.

RESULTS

Summary

The 90-minute game was divided into three sessions or rounds. The teams developed their own strategies during the first round; they exchanged strategies with their counterparts (Blue with Purple) in the second round, commented on the "foreign" strategies, and revised their earlier recommendations as appropriate. In the third round, the teams were required to switch identities with their foreign counterparts; this change was unexpected and does not appear in the players' handouts.

In the first round, the recommendations of the two Blue teams were similar to each other and to those reported in previous games.[1,2] The two key themes were 1) fostering, developing and protecting new technologies, and 2) reforming the educational system. Neither Blue team seemed overly concerned with American competitiveness in the first round.

The Purple teams consciously or unconsciously chose Japan as their generic Purple country. They seemed convinced of their economic superiority.

They seemed convinced of their economic superiority

convinced of their economic superiority. Their goals were to continue to expand their markets, and to protect and encourage their lead with government subsidies and trade protection. They believed that the US was a good source for new technology but that it could be exploited either through US openness or forming biased alliances with US companies. The US could be manipulated through the media or with lobbyists. The low opinion of US competitiveness and business culture was shared by all Purple teams to date.[1,2]

In the second round, the Blue teams showed a heightened concern. Blue 1 proposed forming alliances with other Asian countries or even with Japan. More aggressive and protective trade and patent policies were suggested.

As in previous games, the Purple response to the Blue strategies was derisive. They felt that the Blue strategies would be ineffective, or even counterproductive. Their "carrot and stick" approach involved continuing exploitation of US strengths, reinforcing US weakness, and modifying their public image to appear less aggressive and uncompromising.

When the Blue 1 team switched to Purple in the third round, it made the surprising recommendation for educational reform to encourage individuality. [This may be an error. Most Japanese probably see their own educational system as superior to the US, as demonstrated by test scores in public school. Perhaps Blue 1 meant only universities. However, it may also be improbable that most Japanese want to make their culture less collective and more individualistic.]

When Blue 2 switched to Purple, they quickly adopted the now familiar strategies of exploiting US openness, hiring Americans, mollifying US hostility and xenophobia, and educating Purple students in the US. They also now recognized the importance of language, and supported English education in Japan and the development of translating machines.

Purple 1's switch to Blue was very stimulating. Having previously convinced themselves of the economic superiority of Japan, they were faced with major problems. Their wrath turned on US lawyers, managers and politicians. They now proposed that the US government act as buyer and subsidizer of high-technology products. The US should develop protectionist trade policies and patent laws, and change the tax laws. Government/industry partnerships should be encouraged. Investment strategies should take a longer term view.

Government/industry partnerships should be encouraged

In essence, Purple 1 now recommended a major revamping of US education, management, manufacturing, etc. The importance of language should also be recognized in schools and business.

After switching identities, Purple 2 also focused on educational reform and

government support of new technologies. Their new strategies were almost identical to those of Purple 1.

Blue Team 1

Blue 1 produced three initial strategies:
1. Create a "Tiger Team" (like the Manhattan project that produced the atomic bomb) with the goal of perfecting existing technology and developing second-generation technology;
2. Perform an assessment of needs and strengths in consumer electronics; determine areas of competitive strengths and weaknesses;
3. Encourage educational reform.

Blue 1 reacted strongly to the Purple 1 strategies, although their counter strategies included both cooperative and retaliatory elements. They proposed either neutralizing Japan by forming alliances with other Asian countries, or trying to form an alliance with Japan. Prior trade agreements should be strictly enforced, but tariffs could be considered as a retaliation. Buying Japanese companies was an option, as was learning from them. The US should consider making the Japanese patent system more like the US system. Government-funded translations of Japanese technical journals was also proposed.

When Blue 1 switched to Purple, they recommended Purple government subsidies of flagging industries, including rice production. They also recommended educational reform to encourage individuality. US research expertise should be tapped by direct funding, or sending Japanese students to study in the US and return to Japan.

Blue Team 2

Blue 2 focused on two recommendations:
1. Revamp the national education system;
2. Foster creativity and innovation by protecting and investing in fledgling industries, with emphasis on protecting innovators.

Revamp the national education system

K-12 reform should involve a competitive school system with choice and local responsibility. A new technical school system should free universities to focus on research and create a highly skilled work force. New teaching methods should be explored, including real-life experiences in the classroom.

Industry and innovation should be protected by: reducing bureaucracy and red tape; providing government investment tax credits for R&D and education and training; changing foreign policy to improve economic security by opening foreign markets, creating level playing fields, stopping foreign dumping, and even practicing protectionism in early product development and commercialization. Cooperation among government, university, industry and labs should be enhanced.

Blue 2 seemed somewhat ambivalent in their response to Purple 2's strategies. Openness was seen as a problem, but

secrecy among different US groups could also be a problem.

When Blue 2 switched to Purple, they sought to take advantage of US openness. Under the assumption that the US has the best innovators, they proposed hiring Americans, creating a US laboratory system (MITI-US), educating Purple students in the US, and seeking opportunities created in the US but which failed for lack of support. Language was also considered an important issue to be addressed by fostering English education in Japan, and developing translating machines.

US hostility and xenophobia should be neutralized by purchasing US-made products, providing scholarships to US

US hostility and xenophobia should be neutralized

students, endowing US chairs in Purple studies, establishing foreign student exchange programs and scholarships and subsidies for Americans who come to Japan to study.

Purple Team 1

Many of Purple 1's strategies were similar to those proposed in References 1 and 2. Their three major recommendations included:

1. Expand markets for Japanese products in the US and emerging countries;
2. Protect and encourage Japanese technology leadership through investment;
3. Exploit US openness to acquire technology.

Exploit US openness

Many specific tactics were proposed for carrying out these strategies (see Appendix D). Common themes included: buying US companies (and keeping their US names) and US technology; exploiting US openness in universities, technical societies, publications and joint ventures; setting up research labs in the US and hiring laid-off US defense workers; hiring former cabinet members as lobbyists; maintaining the current trade environment; continuing Japanese government subsidies to industry; and teaming with China.

Purple 1 also emphasized the belief (similarly expressed in References 1 and 2) that the US was crippling itself through litigation, regulation, poor business management, and its role as the world's policeman, and that this situation should be encouraged by "stirring the pot." They also felt that US public opinion could be manipulated through disinformation.

The emphasis on the importance of language was also reiterated, both as a tool to keep internal secrets (in Japanese) and to discover US secrets through open publications in English.

Purple 1 ridiculed the Blue 1 strategies: "They're dead."

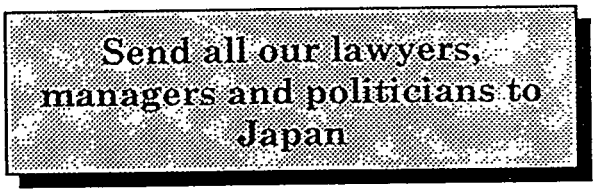
They're dead

They were very confident of the

economic strength of the Purple country, and not worried about current or future US plans. The Blue 1 "Tiger Team" strategy was considered to be too narrow and unproductive. Environmental groups would be funded to "thwart the Tiger Team efforts." Improvements to the US educational system were supported, since Purple 1 believed that they (Japan) would benefit as much as the US. However, the irony of Americans playing Japanese and ridiculing American strategies struck at least one player: "Here we are laughing at this."

Returning to their Purple roles, they reiterated and emphasized their strategies of exploiting US educational and research strengths, reinforcing US weaknesses, and using trade agreements to strengthen their advantage.

The switch to a US role emphasized the irony of their previous discussions. "We're in deep ----!" "Shoot all the foreign students!" "Send all our lawyers, managers and politicians to Japan." Purple 1 easily switched roles but with a more urgent view of the need to reverse



the trends they had previously explored. Specific suggestions included: requiring the US government to both buy and subsidize high-technology products from US companies; opening up China, Russia, etc.; building US factories in emerging countries; setting caps on product liability; hiring and/or exploiting foreign talent; developing protectionist trade policies and patent laws; changing the tax laws; developing a better understanding of foreign cultures; increasing government/industry partnerships and consortia; reducing the time between innovation and manufacturing; and taking a longer term view of investment strategies.

They proposed revamping the US in education, management, manufacturing, etc. Teaching foreign languages in elementary school and rewarding multilingual capabilities reemphasized the importance of language in global competition.

Purple Team 2

Purple 2's primary strategy was to create an industry consortium to pool research, share resources, establish a "National Industry Laboratory," and have the Purple government guarantee a market to support start-up companies. Aggressive and protective tactics included taxing imports, dumping products in the US, forming strategic alliances with US companies, seeking Purple government support of marketing and R&D, supporting students in the US, monitoring US patents, and supporting overseas advertising, public relations and lobbying.

In response to Blue 2 strategies, they would sell flat panel display [products] to schools at low cost, allow token incursions for US production, be friendlier, manipulate the media, hire US talent from their

national labs, and "just talk about open markets."

After switching identities, they proposed two major strategies involving overhauling the educational system and government support of new technologies and companies.

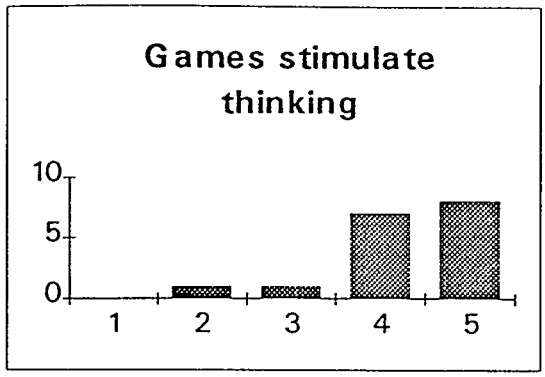
The educational system should be overhauled by employing teacher evaluations and discontinuing the approach of teaching to the lowest common denominator. Purple 2 also recognized the importance of language and culture after switching roles. Japanese should be offered as a language in both secondary and post-secondary schools. They proposed a forum for industry involvement in the full educational process.

Government support for new companies could be in the form of tax credits, tax reduction, and modifications of laws on anti-trust, product liability, and insurance. As with most other teams, Purple 2 now recommended the "death penalty" for lawyers.

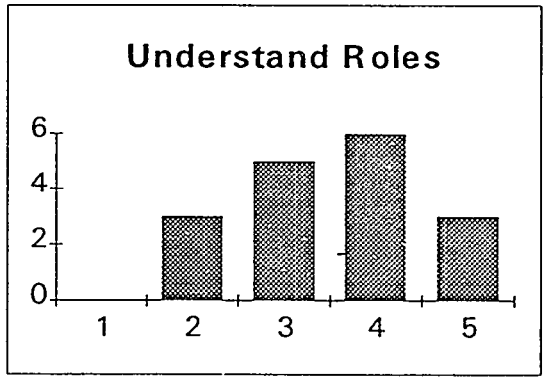
GAME EVALUATION

An evaluation sheet was distributed at the end of the game (see Appendix A). They were asked to vote, on a scale of *1 = very little to 5 = very much*, on six questions assessing the effectiveness of this very abbreviated Prosperity Game.

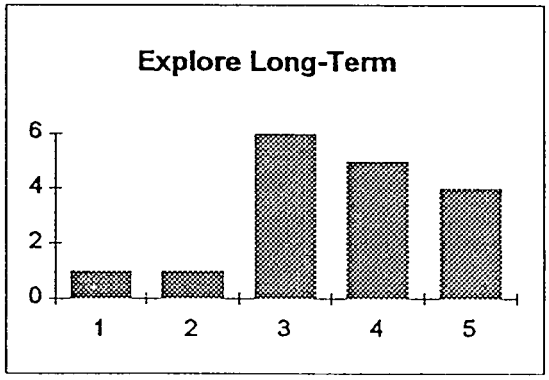
The players believed rather strongly (median = 4.29) that the game stimulated their thinking.



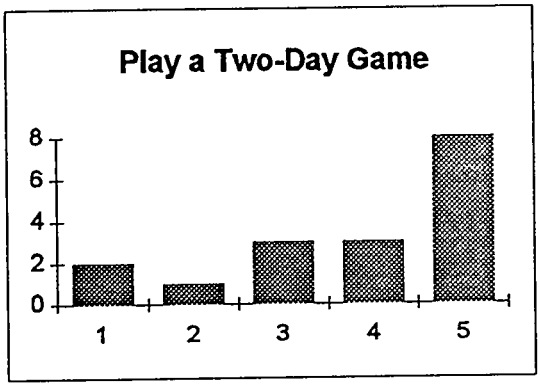
A good but lower score of 3.53 was reported for the extent to which the game helped them understand the different roles of industry, government, universities and laboratories.



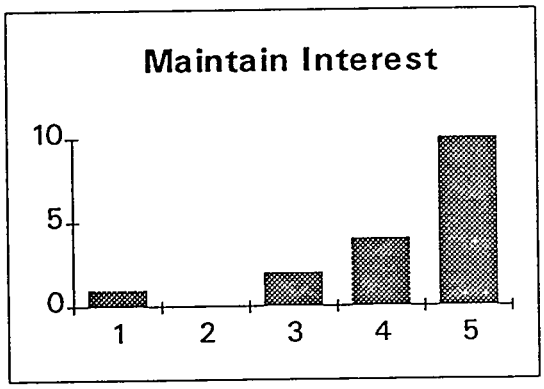
The extent to which the game explored the long term received a median score of 3.59.



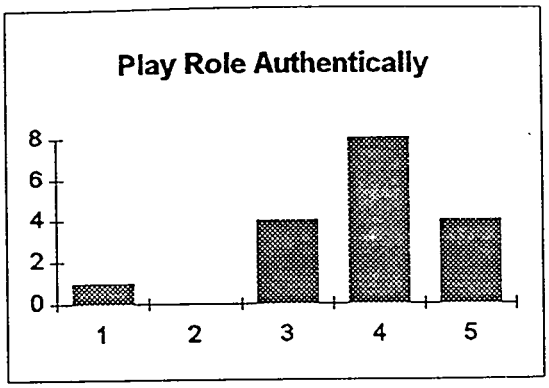
Many players also expressed significant interest in playing a full two-day game with knowledgeable peers at some time in the future; median = 3.82.



The game was very successful in maintaining the players' interest with a median score of 4.29.



Despite the fact that the role-playing involved stretching across industry, government, university, and laboratory roles, and also across national cultures, the players felt that they did a reasonable job; median = 3.82.



LESSONS LEARNED

This game confirmed some of the lessons learned in previous prosperity games, and also provided new data:

- The preferred number of players on each team is from 5 to 7.
- Prior socialization among team members contributes to the teams' productivity.
- Handbook material should be made available prior to the game. Handbook should provide data useful to the players in defining and assuming their roles.
- The appropriate simulation for the Purple team is a single foreign country, rather than a consortium.
- The performance of the staff facilitators and analysts is enhanced with increasing knowledge of the issues being addressed in the game.
- Good analysis is required to capture and understand the players' contributions and deliberations. All

teams should have analysts.

- Although players self-assess their abilities to play their roles as high, diversity adds to the creativity and believability of the teams' results.

- A conventional Prosperity Game takes from one to three days. This game showed that a 2-hour "sampler" can still be stimulating and productive.

A unique feature of this game was the required switch in national identities. This addition seemed to induce a marked change in the players' attitudes and creativity, regardless of the direction of the switch. Purple players switching back to Blue became immediately aware of the difficult problems facing the US in manufacturing competitiveness. Blue players switching to Purple developed a more sympathetic understanding of the Purple (i.e., Japanese) situation; they also became more aware that they lacked knowledge about the Purple country's culture, educational system, etc.

Previous Prosperity Games used qualitative and quantitative metrics to estimate the effectiveness of the proposed strategies. This game used no metrics. One player commented : "Develop a more objective scoring metric.... Previous games I have been involved in had more concrete interaction between teams (e.g., buying/selling w/dollars; or investing in real markets." The use of metrics in Prosperity Games may depend on the objectives and format of the particular game, and also on the expectations of the players. Future games will continue to evaluate metrics and how they can best be used to accomplish the games' objectives.

ACKNOWLEDGEMENTS

Pace VanDevender provided both the opportunity for conducting the game, and support throughout its preparation and execution. Sandia staff (see Appendix C) provided outstanding support in facilitation, analysis and documentation of the game. Jim Jorgensen and David Strip provided excellent white papers on flat panel displays and robotics. Alex Ryburn, Kathleen McCaughey, and Patti Sanchez provided administrative and logistical support that led to a successful contribution to Sandia's Advanced Manufacturing Day. The enthusiastic contributions of the players themselves were the primary cause of a stimulating and creative prosperity Game.

APPENDIX A: SUMMARY GAME DESCRIPTION

PROSPERITY GAME: ADVANCED MANUFACTURING DAY
ALBUQUERQUE CONVENTION CENTER - RUIDOSO ROOM
TUESDAY, MAY 17, 1994 - 2:30 PM TO 4:00 PM

GAME FOCUS: CONSUMER GOODS IN ELECTRONICS MANUFACTURING

OBJECTIVE: To develop strategies to improve US global manufacturing competitiveness in the production of consumer goods, including intermediate components and final products.

TEAMS: Two Purple (foreign) and two Blue (US). Each team sits at a separate table in a large room.

PLAYERS: 2 from industry, 2 from government, 1 university/expert, 1 lab director.

INTRODUCTION: 10 minutes

DESCRIBE OBJECTIVE, GAME FORMAT

INITIAL ASSUMPTIONS: US losing competitive position; almost no onshore manufacturing of consumer electronics; threats to national security; loss of jobs/reduction of GDP.

INITIATING EVENT: President forms high-level committee to propose strategies to improve competitiveness. Purple country learns of committee; forms its own committee to counter any Blue moves.

FIRST ROUND: 30 minutes

The Blue Teams are provided with a list of possible strategies. They develop no more than two strategies, adopting some of the recommended ones, or developing their own. They discuss and assign priorities to each strategy by a voting algorithm. Prepare a document listing strategies and their priorities. Add additional comments if desired.

STRATEGIES ARE WRITTEN; TEAMS ASSIGN PRIORITIES

SECOND ROUND: 20 minutes

Recorders distribute Blue 1 recommendations to Purple 1, Purple 1 to Blue 1, etc.

READ AND DISCUSS THE STRATEGIES OF THEIR COUNTERPARTS.

THIRD ROUND: 25 minutes

Blue and Purple teams modify strategies. Any changes are documented.

CONCLUSION: 5 minutes

Thank you. Comments welcome. Players fill out written evaluation forms.

SUGGESTED POSSIBLE BLUE STRATEGIES

1. The US government should develop a program to consolidate the purchase of electronics equipment for all agencies of the government. The program will assess the government needs for the next five years, develop programs to promote the best technology, provide industry with the market demand data, and develop an overall purchasing strategy that provides a preference for domestically produced products.

2. Encourage major educational reform to make Americans the most productive workers and intelligent consumers in the world. Develop a program to improve education with an emphasis on science and technology. Invest in university and laboratory research in electronics technology. Support the National Information Infrastructure initiative.

3. Overhaul US government regulations by modifying the anti-trust laws to allow industry alliances, reducing the burden of environmental regulations, removing export controls. Level the playing field for domestically sited facilities versus those located abroad.

4. The government should take a lead role in encouraging exports, enforcing fair trade laws, eliminating tariffs, and protecting intellectual property.

5. Adopt monetary policies that increase the availability of low-cost, long-term capital. Reduce long-term capital gains taxes and taxes on corporate dividends. Pass legislation to permit banks to provide equity financing to US corporations. Provide investment tax credits for industries that invest in consumer electronics production.

6. Teams produce their own strategies.

SUGGESTED POSSIBLE PURPLE STRATEGIES

1. Encourage the US to make no regulatory changes in tax policy, antitrust laws, and environmental restrictions.

2. Encourage the US to increase spending on health care, welfare, and other social programs.

3. Encourage the US to retain its role as world policeman, to increase defense spending, and to build additional foreign bases, especially in the Purple country.

4. Exploit US openness of university and industry groups; fund US university/laboratory research; send Purple students to US universities.

5. Continue trade negotiations that favor the Purple country; if necessary, stall and give the appearance of trade concessions without any major changes.

6. Teams produce their own strategies.

PROSPERITY GAME EVALUATION

1 = VERY LITTLE TO 5 = VERY MUCH

QUESTION	1	2	3	4	5
Extent to which the game stimulated thinking?					
Extent to which the game helped you understand the roles of industry, government, universities and laboratories?					
Extent to which the game explored the long term?					
Would you like to play a full two-day Prosperity Game with peers from industry, government, universities, and laboratories?					
Extent to which the game maintained your interest?					
Extent to which you were able to play your assigned role authentically?					

Name (optional):_____

Company:_____

Address:_____

_____

Phone:_____

Fax:_____

Suggestions for improvement:_____

_____

APPENDIX B: WHITE PAPER ON FLAT PANEL DISPLAYS

THE FOLLOWING IS EXCERPTED FROM THE APRIL 1994 REPORT BY THE AMERICAN ELECTRONICS ASSOCIATION FLAT PANEL SYSTEMS TASK FORCE REPORT ENTITLED: "U.S. HIGH-VOLUME MANUFACTURING OF FLAT PANEL DISPLAYS.

CREATING A U.S. FLAT PANEL DISPLAY INDUSTRY: INDUSTRY-GOVERNMENT COOPERATION

Why Displays Are Important

The National Advisory Committee on Semiconductors, in its 1992 final report, emphasized the importance of building a strong U.S. flat panel display (FPD) industry. Failure to maintain a robust research and development, equipment and materials infrastructure, and to participate in the high-volume manufacture of FPD's could threaten the loss of a range of markets, from workstations and personal computers to portable electronics and video systems. The U.S. electronics industry overall accounts for more than nine million jobs. In camcorders, laptops, video phones, cars, tanks, aircraft, spacecraft, submarines, and a widening variety of other high volume commercial products and essential military equipment, displays are critical.

Advanced flat panel systems incorporate much of the power of the equipment and represent as much as 50% of the product's value and cost, and this fraction is growing. FPD's will be as critical to advanced electronics systems in the next decade as semiconductors have been in the last two decades. As the national information infrastructure expands and becomes increasingly adaptable to interactive video and multimedia communications, new applications will emerge. Because displays are essential components of an increasing number of advanced computing communications and high-volume personal electronics products they are also essential to U.S. technological and economic leadership.

The strength of the U.S. electronics industry as a whole, with its millions of skilled well-paying jobs and billions of dollars of exports, depends upon U.S. strength in each critical segment of the industry, including FPD manufacturing. For similar reasons, FPD's also have beccme integral to sophisticated military and defense systems and therefore to the nation's security interests.

The Market for Displays Is Strong and Growing

The market for displays is growing remarkably as sophisticated new products continue to appear. E.g., in computers, the Apple PowerBook brought in more than $1 billion in revenues in its first year and, reportedly, could have brought in an additional $1 billion, except for the fact that there was no adequate source of displays. IBM realized $300 million from sales of its Think Pad in its first day on the market, and $1.3 billion in the first year. Significantly, its color AMLCD model led the sales. There is a strong and growing market for FPD's in the U.S., which accounts for more than 30% of the work market.

Despite some important efforts, the U.S. has an insignificant position in the global FPD marketplace. Currently Japanese firms hold a dominant place, selling more than 95% of all FPD's worldwide and in the U.S. This situation raises serious concerns for the United States. Our leading high-tech companies and even our military and defense systems depend on a small number of suppliers in a single foreign country for this critical technology.

Depending on a few foreign suppliers has commercial risks also. Even short-term delays in delivering components as important as FPD's can hamstring U.S. firms in their efforts to rapidly field new product concepts to achieve a decisive first-to-market edge. Such factors stifle the ability of U.S. companies to provide innovative products and put them at serious disadvantage.

ARPA'S Program in Flat Panel Displays

Recognizing the central role of displays for the electronics industry, the U.S. economy and for national security, the federal government, through ARPA, has made substantial contributions in recent years to research and development of a wide range of technologies associated with high-definition systems, including flat panel displays. More recently, the government also has funded efforts to develop the infrastructure for an ongoing FPD industry in the U.S.

ARPA's program is an effort to develop FPD technology and manufacturing capability for defense and commercial applications. The program is designed to develop a wide range of technologies associated with FPD's, including processors, sensors, data compression techniques, software, high-density storage, packaging and manufacturing.

Successes of ARPA's program to date include development of a liquid crystal display for the F-15 Horizontal Situation Indicator, a 6.3 million pixel AMLCD display, a stereoscopic projection display, a 19-inch diagonal color plasma panel, a 4-inch by 5-inch color, electroluminescent panel, and high resolution video workstation design and software.

The federal funds committed to these programs have significantly leveraged greater investments by private industry. This combined public and private effort can come to fruition, however, only if the U.S. succeeds in establishing a viable, domestic high-volume FPD manufacturing industry.

Industry Efforts in Display Research, Technology, and Infrastructure

U.S. companies have invested hundreds of millions of dollars in flat panel systems research in recent years. As a result, the U.S. has achieved some breakthroughs and leads the world industry in some aspects of FPD technology. Xerox, for example, has produced a 13" (diagonal) AMLCD screen with 6.3 million pixels, surpassing by some 50% the resolution of the most advanced Japanese product. Also, U.S. firms hold some key patents in FPD systems technologies.

However, breakthroughs in research and technological innovations are not enough. A viable FPD industry depends upon many related and interactive technologies and supporting industries, from equipment and materials suppliers, to developers, manufacturers and, most importantly, customers. Establishing viable competition in the U.S. will require a high level of understanding, interaction, coordination and support among all key players.

In a dramatic step toward that goal, the U.S. Display Consortium was organized in 1993. The USDC and its display-manufacturer members coordinate federal government support for the equipment and materials infrastructure for a U.S.-based, world-class FPD industry. USDC currently has 22 projects under review, and in March 1994 granted its first contract. The USDC is building necessary infrastructure support in all critical segments for an FPD industry.

The Final Step: U.S. High-Volume Manufacturing

A key strategy for maintaining and increasing the competitiveness of U.S. electronics companies in advanced flat panel systems, is for the U.S. to establish a domestic, world-class high-volume manufacturing capability. Customers look for demonstrated capacity to produce and deliver commercial quantities of quality FPD's on time. They expect predictability and reliability, and they want assurance that the supplier will be there for the future. Start-up companies must be prepared to overcome skepticism on the part of potential customers, who understand the complexity of the manufacturing process and the difficulties that new entrants must surmount.

The U.S. Government has funded production prototype facilities as a first step in demonstrating a producer's ability to manufacture the reliable and cost-effective products. U.S. high-volume manufacturing of state-of-the-art displays is essential, but an industry-government partnership is needed to hurdle formidable entry barriers.

Barriers to Entry

While potential manufacturers know what is required to establish a volume manufacturing industry in the U.S., the financial barriers to entry are high. The investment required is such that initial returns are perhaps 8-10 years out -- far beyond what potential U.S. investors will usually accept. The barriers are the same for an individual company or a group of companies. Even leading U.S. high-tech firms face distant and uncertain returns and thus insufficient economic incentives to undertake on their own the huge investment that FPD manufacturing requires.

Japanese companies, on the other hand, are in an entirely different situation. They are already in full commercial production, benefit from sustained government support in the form of depreciation and tax incentives, and hold a near-monopoly position in the world marketplace. They have every incentive to continue investing heavily in FPD manufacturing to maintain their market dominance.

At the same time, these companies are not without problems of their own. The recession in Japan over the last couple of years has limited available capital and slowed domestic demand considerably, with direct impact on even leading companies. In addition, some of the largest Japanese FPD manufacturers, with first-generation equipment and processes, have experienced significant uptime, yield and throughput problems.

A Window of Opportunity for U.S. Industry-Government Partnership

U.S. technological strengths are significant: important progress has been made in standards, major segments of the infrastructure are in place, and the marketplace is waiting. A continued lull in the Japanese economy has slowed the dynamic for leading Japanese display producers. The U.S. has a window of opportunity, an opening to leapfrog existing Japanese products by moving quickly to production of more advanced second- generation display systems. Federal government partnership and support during an initial start-up period would dramatically improve prospects for establishing a viable domestic FPD industry during the present limited opening. With the federal government as partner, a company or group of companies would face less severe risks and investors could hope to realize a return on their investment at an earlier date. Government participation in such an enterprise would also give potential suppliers and customers greater assurance of stability.

The federal government already has recognized that economic security -- requiring competence and leadership in core technologies -- is as critical to the nation as military security has been historically. The U.S. semiconductor industry has regained its preeminent status, with the largest market share of any nation in the world. The U.S. electronics industry may be able to recapture many consumer electronics markets -- once lost to Asian competitors -- both in the U.S. and abroad. The U.S. cannot risk relying exclusively on foreign manufacturers for a technology as critical as flat panel displays.

In today's economic environment, where skilled jobs are vital, creating a viable FPD industry in the U.S. would strengthen both suppliers and customers, and significantly bolster the U.S. economy. A domestic FPD manufacturing industry would produce high-skilled, high-paying jobs while facilitating entry of other U.S. products into a large and growing international market.

Recommendation: A Call for Cooperation

The importance of the FPD industry to the U.S. national and economic security, coupled with the current lack of domestic high volume manufacturing, requires a concerted industry-government response. The AEA Flat Panel Systems Task Force calls for an industry-government partnership in high-volume FPD manufacturing.

APPENDIX C: LIST OF PARTICIPANTS

ADVANCED MANUFACTURING DAY
MAY 17, 1994

LAST NAME	*FIRST NAME*	*COMPANY*	*ADDRESS*	*PHONE NO.*	*FAX NO.*	*TEAM*	*ROLE*
Brandon	John	lLaguna Industries	PO Box B, Laguna, NM 87026	505-247-0551	505-552-9265	Blue 1	
Cuneo	Peter	Lockheed	6400 Uptown Blvd., #300, Albq. 87110	505-880-0155	505-837-0145	Blue 1	
Rigg	Andy	CHTM	6515 TrujilloRd,SW, Albq., 87121	505-831-6615		Blue 1	
Weber	Bob	UNM	School of Law, 1117 Stanford NE, Albq. 87131	505-277-7246	505-277-8362	Blue 1	
Garcia	Marie	Sandia Nat'l Labs				Blue 1	Facilitator
Apodaca	Theresa	Sandia Nat'l Labs					Recorder
Bahill	Terry	Sandia Nat'l Labs	Dept. 5153, PO Box 5800, Albq. 87185			Blue 2	
Born	David	Dow Chemical	800 Bldg., Midland, MI 48667	517-638-3115	517-638-7318	Blue 2	
Nimitz	Jon	ETEC	3300 Mountain Rd,NE, Albq.	505-256-1463	505-256-1003	Blue 2	
Otero	Frank	Valencia County Assessor's Office	PO Box 909, Los Lunas, NM 87031	505-866-2049	505-866-2002	Blue 2	
Williams	Dave	Sandia Nat'l Labs					Facilitator
Martinez	Martha	Sandia Nat'l Labs					Recorder

LAST NAME	FIRST NAME	COMPANY	ADDRESS	PHONE NO.	FAX NO.	TEAM	ROLE
David	Ruth	Sandia Nat'l Labs			505-844-2043	Purple 1	Lab
Nethers	Jan	Application Design Eng'g.	PO Box 3521, Farmington, NM 87499	505-326-2088	505-326-2086	Purple 1	University
Nilsen	Kevin	Dow Chemical	52 Building, Midland, MI 48667	517-638-6505	517-638-7092	Purple 1	Lab
Pasco	Skip	Sunsoft Corp.	6815 Academy Pkwy West, NE, Albq.	505-345-7967	505-345-2235	Purple 1	Industry
Schrader	Karl	S. Systems Corp.	2501 Yale Blvd,SE,#100, Albq. 87106	505-247-3340	505-247-3345	Purple 1	Gov'mt
Schroeder	Don	Sandia Nat'l Labs					Facilitator
Boyack	Kevin	Sandia Nat'l Labs					Analyst
Nenninger	Connie	Sandia Nat'l Labs					Recorder
Knight	Robert	GRC Automation	Box 917, Placitas, NM 87043	505-867-5863	505-867-5880	Purple 2	
Slama	Mike	National Semiconductor	PO Box 58090, MS E-100,Santa Clara, CA 95052	408-721-4263	408-721-3342	Purple 2	
Tary	John	Fichtner Engineering Inc.	2801 Youngfield St., Ste.121 Golden, CO 80401	303-238-7548	303-238-7798	Purple 2	
Turner	John	GRC Automation	304 No, Auburn, Ste A, Farmington, NM 87401	505-326-2088	505-326-2086	Purple 2	
Wagoner	Roy	Xero Defex	312 Mulberry NE, Albq. 87106	505-247-8260		Purple 2	
Moye	Bill	DeLaPorte					Facilitator
Mitchell	Cheryl	Sandia Nat'l Labs					Recorder
Berman	Marshall	Sandia Nat'l Labs					Game Director
Ryburn	Alex	Sandia Nat'l Labs					Control

APPENDIX D: ACTION MEMORANDA AND ANALYSES

BLUE TEAM 1 STRATEGIES - ROUND 1:

1. Tiger Team of technical people (i.e., Manhattan Project)
   - minimum intervention outside forces.
   - get rid of rules for sake of rules.
   - don't allow special interest groups to interfere.

   Goal of Tiger Team:
   - Perfect existing technology
   -Develop second generation technology with "leap frog" principle

2. Assess needs/strengths
   - Survey of consumer electronics/identify needs, market share.
   - Identify where we have competitive advantage over Japanese.

3. Encourage focused educational reform
   -Develop short & long-term goals.
   -Key teaming arrangements.

DISCUSSION - ROUND 1:

- 2nd generation; learn from 1st generation.
- Having problems in the manufacturing side (Japanese).
- Keep abreast of current "state-of-the art."

ROUND 2 - BLUE TEAM 1 REACTIONS TO PURPLE 1 STRATEGIES:

- Forge alliances with four Tigers (neutralize Japan).
- Form alliance with Japan.
- Don't play by normal, open society rules in US.
- Purple's "A" recommendation is a "wish," not a strategy.
- Strictly enforce prior trade agreements.
- Open Japan's patents system--make more compatible with US system.
- US Government should pay for translation of Japanese technical journals and make them available.
- Tariffs as a retaliation against Japanese.
- Buy Japanese companies.
- Learn from the Japanese (look at what happened with the US auto industry).

BLUE TEAM 1

DISCUSSION - ROUND 2:

- Aren't we to "fight" against the other countries strategies?
- Doing business in Japan is tougher than doing business in the US.
- Japanese aren't as in as good a shape as they were a few years ago.
- Not aware of who is creating consumer electronics in US.

ROUND 3 - BLUE TEAM 1 CHANGES IDENTITY TO PURPLE:

- Increase competitiveness in our own country (Japan).
  -Govt. subsidizes some of its flagging industries.
  -Identify what we can afford to give away--keep enemy off balance.
- Funding US research for Japanese use.
- Reform our education system to reflect some of the best practices of US education system (encourage individuality).
- Try to encourage growth of Japanese citizens' PhDs and return to Japan.

DISCUSSION - ROUND 3:

- Subsidize rice to stimulate country.
- Japan's strategy is to keep US "off balance."
- Statistics say PhDs is down.

As a group, how did you feel when asked to change roles? (US to Foreign)

- Can't understand the Japanese mind set; have to get immersed into the culture.
- Difficult to take on Purple (Japanese) role due to lack of knowledge, understanding of the Japanese.
- Better feel for why Japanese operate the way they do (exploitation). Don't have the luxury that the US does.
- If we had people playing their real roles (real Japanese) there would be more push & pull among participants re: strategies
- Actual case histories (without knowing the real outcome) would be helpful.

Comments on this Prosperity Game:

- Not a good scoring metric.
-"Proof in the pudding" is missing.
- Need mechanism for individuals to come together after the game to collaborate.

BLUE TEAM 1

ANALYSIS OF BLUE TEAM 1

Blue Team 1 had a little trouble at the beginning getting started because most of its assigned players did not show. We had one assignee, two drop-ins and our analyst (who became one of the players). There was some awkwardness among the team players. I believe it was due to the fact that they did not know each other and felt a little uncomfortable speaking their mind. What this tells me is that the social time we normally have for these prosperity games is very important. In addition, there was little time for the players to become familiar with the package of information given them. They were pretty much expected to react immediately. For the real Prosperity Games, the players are given their player's handbook ahead of time.

The person trying to play the university role had a difficult time stepping out of his industry role. After a while, he quit trying. At first, the players were in an adversarial mode. I reminded them that it was their job to try to work out their differences for the good of the nation. In addition, I pointed out that maybe their positions were not as diametrically opposed as they think and that together they could come up with a better product than any one of them could on their own.

During the first round of play, the players seemed to be getting things off their chests more than trying to seriously come up with good strategies. However, when they were asked to react to the Purple 1 Team's proposed strategies, they got more serious and started generating ideas more as a team than as individuals. In fact, one person would offer an idea and other players would fine-tune it rather than shoot it down.

I believe that asking the teams to switch identities was very helpful. Although they had a difficult time doing so, the players remarked that this type of role playing made them more sympathetic toward the Japanese and with the situation in which the Japanese have to contend. The players said that they felt inadequate filling the role of the Japanese as they lacked information about their country, their culture, their education, etc. They also felt that the individualism, that is so much a part of the American culture, is very hard to put aside. This hampered their thinking when trying to walk in Japan's shoes.

Some of the players questioned the benefit of Prosperity Games. What are the true outcomes of these games, and how do we measure the success of the games? In other words, what are the metrics? I asked Pace to talk to one of the players and the knowledge gained from that conversation seemed to sway the person to a more favorable opinion about the goals of this endeavor.

As a person facilitating a Prosperity Games Team for the first time, I found this condensed experience to be very beneficial. Again, the better informed you are about economics, world events, and the consumer electronics industry, the easier it is to pull information from the team, even to challenge their thinking--without delving into their content.

BLUE TEAM 2 STRATEGIES - ROUND 1:

DISCUSSION:

1. Long-term improvement in education system:
   Elements:
   - More outings to real life situations, visit industry, gov. places.
   - Research into new teaching methods.

2. Develop some type of National Pride:
   - Instead of just "working for money," work to produce quality products.

   Elements:
   Education

3. Protect & invest in research & early development:
   Elements:
   - Make sure other countries are not dumping new products .
   - Provide some other incentives to company developing products.
   - Make sure of availability to sell products overseas.
   - Protect product in early development.
   - GUILD cooperation to work faster, more efficiently.

- US has the ideas, but others put them into play.
- Encourage change in educational system, education plays a big role in foreign country.
- Bringing in foreign students, training in our universities, but yet keeping them here.
- Make government "step-back" from schools.
- Fostering competition in our schools in the formative years (K-12).
- Make it fun for students, allow students to choose their schools, make the community responsible, better assessment of skills-let's say in high-school.
- Government investment tax credits for R&D, education, and training.
- Must increase the sense of national well-being.

More important items of discussion:

University: Competitive schools
New tech schools system

Industry: Tax credits
Practice protectionism

Competitive schools
New tech. school system

Government: Tax credits
Reduce gov. red tape for small businesses
Open foreign markets
Research new teaching methods
Competitive schools
New tech school system
Reform K-12

Our objective is to foster national pride in US productivity and the quality of our products through
- Education of the populace;
- Creativity and innovation.

In order to achieve this, we recommend a strong 2-point program:

Recommendation 1. Revamp the national education system:
- Create a new effective technical school systems freeing the universities for research and creating high-skills work force training.
  Research into new teaching methods; e.g., more interactions and more real-life experiences in the classrooms.
- Reform K-12 schools:
  Competitive schools of choice
  Local responsibility

Recommendation 2. Protect & invest in fledgling industries, with particular emphasis on protecting innovators:
- Government investment tax credits for R&D and education and training
- Reduce bureaucracy
- Structure foreign policy with eye toward economic security; e.g.,
  - Open foreign markets - create level playing field
  - Practice protectionism in early-phase development and product introductions.
  - Stop foreign dumping of new products
- GUILD cooperation enhanced for rapidly getting new products to market which are a source of much technological innovation

ROUND 2 - BLUE TEAM 2 REACTIONS TO PURPLE 2 STRATEGIES

When industry runs with gov. & universities, information becomes available to everyone - this is a problem - reduces cooperation between the three.

Legislation gives industry more protection.

We may want to be more responsive to our overseas marketplace.

Putting together industry groups, industry might begin hiding things from each other; the result would be no cooperation.

Protection of international [sic. intellectual?] property.
Can prevent the actual information from being published

Put more barriers in the way so foreign country will have more problems in acquiring information.

Barriers: Secrecy

ROUND 3 - BLUE TEAM 2 CHANGES IDENTITY TO PURPLE:

Take advantage of US openness to get information.

Find best innovators; buy them and their brightest children.

Create lab in US and hire all people.

Create a MITI-US.

Send our best students to the best schools in US and bring them back; could also assign them to MITI-US.

Look for opportunities where US failed to support and take advantage of innovative products and processes.

Work on translating machines to translate from English to Japanese.

Foster English education.

BLUE TEAM 2

Defuse hostility and xenophobia by making Americans feel good about what they do well and we (Purple) don't.

Show them that we are good international customers, and that we support them by purchasing from them.

Start giving money to the brightest US students.

Endow US professor chairs in Purple studies.

Give scholarships to US students who come to Japan.

Support foreign exchange program to students, so that they will not view us as the "enemy" any longer; provide low-cost transportation and vacations.

Focus on high-value-added products, where scarce raw materials are not significant components.

NEW STRATEGIES:

Get their best workers working for us :

* Create "MITI-US"
* Send our best students to US schools & bring them back; bring their best to Purple Land.

Exploit their open culture & practices

* Look for opportunities where US failed to support innovative products/processes
* Foster English education in Purple Land

Improve our image in the US

* Student exchange programs
* Make Americans feel good about what they do well which we don't
* Endow US professor chairs in Purple studies
* Inform the Americans of the benefits they receive from our products

PURPLE TEAM 1 STRATEGIES - ROUND 1:

DISCUSSION - ROUND 1:

1. Don't kill the market.
2. Expand market for F.P.D.
3. Fund Japanese Labs to keep technical lead.
4. Steal best US Ideas; exploit openness of US.
   NII; meetings; Infiltrate Universities
5. Publish only in Japanese.
6. Don't let government make unfavorable trade agreements.
7. Open Japanese factories in US.
8. Buy US companies, but keep US name.
9. Hire former cabinet members as lobbyists.
10. Japanese government subsidize Japanese R&D.
11. Japanese government send Japanese student to US universities.
12. Build products for US healthcare.
13. Start third world conflicts to encourage US to be world policeman.
14. Apply for US Loan extensions.
15. Encourage US to self-cripple with litigation.
16. Educate and train Japanese workforce.
17. Team with China.
18. Trade China labor for products.

19. Global focus for Japanese products.

20. Stay one step ahead in getting product to market. (US improving; therefore Japanese must improve).

21. Strategy must be win-win.

22. Target US government and universities. Add sources of technology.

23. Set up Japanese research labs in US and hire laid-off defense workers.

24. Work with Boeing and steal technology.

25. Give grants to US companies to develop new technology.

26. Get Russian technology first.

STRATEGIES SUMMARY - ROUND 1:

A. Expand market for Japanese products.
- U. S. domestic
- Emerging countries

B. Protect and encourage Japanese technology lead through investment.
- Invest in people
- Buy US companies
- Form consortia
- Maintain existing trade status

C. Exploit openness of US society to acquire technology.
- University
- Tech Society
- NII
- Pubs
- Joint ventures

ROUND 2 - PURPLE TEAM 1 REACTIONS TO BLUE 1 STRATEGIES:

1. Fund US environmental groups to thwart US "Manhattan Project."

2. Exploit US media to sway public opinion against "Project."

3. Continue marketing to build image of high-quality Japanese products.

4. Use GATT, etc. to stifle US protectionist strategy.

5. Steal results of US strength/weakness assessment.

6. Feed US disinformation regarding our strength.

7. Encourage US to spend more on education.

8. Japanese fund US universities and send Japanese students to US universities.

Summary:

Manipulate US public opinion against US business strategy and in favor of Japanese products.

Leverage US education funding to enhance Japanese factories in US and Japanese technology.

Steal results.

Feed disinformation.

ROUND 3 - PURPLE TEAM 1 CHANGES IDENTITY TO BLUE:

1. Send US lawyers, managers and politicians to Japan.

2. Identify means to recapture US domestic market.

3. Require US government to buy high technology products from US companies.

4. Open up China, Russia, etc. to US products preferentially.

5. Build US factories in emerging countries.

6. US government subsidize high-tech US industry.

7. Set caps on product liability, health care, "Tort Reform."

8. Adopt US standards incompatible with current Japanese products.

9. Hire Japanese engineers.

10. Revamp US: Education, Management, Manufacturing, etc.

11. Exploit foreign talent.

12. Improve US ability to exploit foreign information.

13. Teach foreign language in elementary school.

14. Reward multilingual capabilities.

15. Protect US technology with tougher patent laws both domestically and internationally.

16. Reduce time of US innovation to U. S. manufacturing.

17. Take long term view of US investment strategy.

Summary:

A. Reverse the exploitation of US resources.

B. Tort Reform
   - Lawyers to Japan

C. Think Globally.
   - Markets
   - Languages
   - Natural Resources
   - Technology and People

D. Increase government/industry partnerships and consortia.

E. Exploit our ability to attract talented people.

PURPLE TEAM 1

ANALYSIS OF PURPLE TEAM 1

Team Characteristics:

- Team make-up was one each of industry, university, and government roles, with two laboratory roles.
- The team relished the opportunity to play the foreign team, and were unified in their thinking and recommendations. No time was lost to personal agendas. Personal credentials were not used to influence the team. Team members developed personal relationships through the team dynamic and convergence of ideas.
- Role-playing as foreigners was very believable in general. However, the various component roles were played to different levels. The industry element role-playing was very believable and was strongly represented. The government role was believable, but with very few comments. The university and laboratory roles were not convincing, but seemed to take on a foreign (industry/government) role in general.
- Some team members commented parenthetically on how things looked from their true positions as participants in the US electronics industry.

After the switch to the Blue viewpoint

- The team switched to the Blue viewpoint very easily, although with the switch in viewpoint, roles were lost. The team seemed to function as an industry body (which is logical since most players were from industry) and used the body of information they had generated as a Purple team as background from which to base new Blue recommendations.

Goals and Assumptions:

- A conscious decision was not made to represent a particular country, yet it was clear that the team felt they were representing Japan.
- Japan is ahead of the US and sees no immediate danger of losing its position. However, it realizes the talent and resourcefulness of US industry and potential for losing position, and takes an active stance to maintain its position. Japan will do whatever is necessary to maintain that position.
- US openness is easy to exploit, and will remain that way. US management is ineffective. US people can be influenced by subtle use of the media establishment.
- US industry and laboratories are vulnerable to loss of key researchers due to the current economic climate and lack of security.

PURPLE TEAM 1

- A major goal was maintenance of current markets and rapid expansion into new markets to increase industry profitability and the countries' standard of living.

After the switch to the Blue viewpoint

- The US is behind and has many obstacles to overcome before they can push ahead of Japan, but it can be done.
- There is urgency to make changes and improve the US position in the short term. "We're in deep _ _ _ _!"
- Resources of US companies are not currently aligned to produce maximum benefit or profit because of tax, regulation, and litigation issues.
- Most people in the world still have a dream to come to the US.

Potential Strategies as Purple 1:

- Establish new and expand current foreign markets, with an emphasis on China and the Pacific Rim countries. This includes establishment of favorable trade pacts.
- Keep our lead by investment in R&D, both through industry and government funding of R&D. Find more applications for flat panel displays. Set up R&D labs in the US and buy the best American minds to staff them. Give grants to USA companies for R&D and gain rights to the resulting technology. Better training for our domestic work force. Publish all the best research in our own language.
- Exploit openness of the US in numerous ways including sending students over, attending symposia, infiltrating companies, buying more US companies and keeping their American names, etc. Target key technologies from US labs and universities for acquisition, and obtain them in whatever way possible.
- Use existing trade agreements to our benefit, making token concessions, or making agreements that we don't intend to follow.
- Promote litigation in the US, start or fuel third world or global conflicts that will keep the US attention off our economic efforts.

Responses to Blue 1 Strategies:

- General ridicule of Blue 1 team strategies. "They're dead."
- Strategy 1 - Tiger Team or Manhattan-type project. Responses: Blue strategy is too narrow. They won't produce anything that is marketable. We're ready for this since we're going to buy more US companies and minds. We should fund US environmental groups to thwart their efforts and make

them comply. We should subtly use the US media to stir up a public opinion against things done in secret. We should use existing trade agreements to thwart US protectionist stance. Modify our exploitation strategy to explicitly target against the Blue strategy.

- Strategy 2 - Assess needs/strengths. Responses: After they assess we will steal their best ideas. During assessment, we'll tell them what they want to hear, give them disinformation on our strengths.
- Strategy 3 - Educational reform. Responses: This will take so long to show an effect that it won't do anything to us. This is a WIN/WIN situation; good short term for us, good long term for the US. Encourage the US to implement this, then send students and money to benefit from it, and get better educated workers in our US plants

Strategies After Switching Identity to Blue

- Reverse current exploitation of US resources (culture, language, hiring foreign talent, expansion). Open up global markets (Russia, China, etc.) to US products, employ local labor force. Develop an understanding of foreign cultures that allows us to more readily acquire information from them. Require more foreign language education and at earlier ages. Use 'standards' to effectively close market to foreign products.
- Tort and patent reform. Set caps on litigation awards and costs. Government must provide better protection for our technology, specifically in terms of global patent laws
- Think globally (resources, languages, markets, technology, people). Hire some Japanese engineers and managers for US industry. Reward multi-lingual capabilities. Seek global talent since America is a desirable place to live.
- Government and industry should collaborate in targeted high-tech areas through partnerships, consortia, etc. Government should subsidize high-tech industry like Japan does. Government should offer tax code incentives for both industry and families. Require government to buy high-tech items from firms where all value added (product and distribution) must be from US companies.
- Develop long-term mind-set, especially for investment. Develop ways to get ideas to market quickly.
- "GM [or any other company] should do what McDonalds has done."
- "Send all our lawyers, management, and politicians to Japan."

PURPLE TEAM 2

PURPLE TEAM 2 STRATEGIES - ROUND 1:

Purple Team 2 decided that they represented Japan.

DISCUSSION - ROUND 1:

*Tax imported products
*Dump products - USA
*Strategic alliance with US companies
*More off-shore manufacturing
*Create industry consortium
*Increase travel fund for lab R&D trade show; continued education for worker productivity
*Govt. sponsored marketing and marketing research and development
*Support students overseas and monitor patents - USA, et al

Govt. funding to acquire knowledge (R&D) research; marketing research to guide the research.

Be more responsive to USA marketplace.

Overseas advertising and public relations and lobbying.

Target major USA cities for technology transfer

STRATEGIES SUMMARY - ROUND 1:

CREATE INDUSTRY CONSORTIUM

1. Pool research
2. Establish a "National" Industry Lab
3. Sharing of resources
4. Govt. support on start-up companies to guarantee a market

ROUND 2 - PURPLE TEAM 2 REACTIONS TO BLUE 2 STRATEGIES:

No. 1 - Sell schools FPD at low cost
No reaction needed

No. 2 - Token opening for US production
- Get our own house in order; stop making US mad
- Just talk about open market
- Take a carrot and stick approach
- Be friendly
- Decrease US patent time from 17 yrs.
- Attend US suppliers
- Discuss interactive trade agreements

PURPLE TEAM 2

Hire US talent from their Nat'l labs
Make US population angry about protectionism

ROUND 3 - PURPLE TEAM 2 CHANGES IDENTITY TO BLUE:

USA Strategies to Improve

1. Govt. support to incubate new companies and technology
2. R&D and investment tax credits; reduce tax burden
3. Teacher evaluation; overhaul education
4. Stop teaching to the lowest common denominator
5. Govt' incentive to technical students; forgive student loans for tech. education
6. Involve industry in the education process
7. Form an industry consortium
8. Govt. funding to acquire knowledge
9. Modify anti-trust law
10. Overhaul the product liability laws; insurance; litigation
11. "Shoot lawyers;" death penalty
12. Govt. support to incubate new companies and technology
13. Business plan to distribute products - in Japan - legal
14. Teach Japanese and learn their culture

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CONCLUSIONS PURPLE 2 (Round Three)

Ranked in order of importance

1. Overhaul educational system with teacher evaluations by discontinuing teaching to the lowest common denominator. Offering Japanese as a language at secondary and post-secondary education levels. In addition programs allowing the student to learn the Japanese culture. Create a forum for industry involvement in the educational process K-post-secondary.

2. Govt. support to incubate new companies and technologies and the re-establishment of R&D/investment tax credits. Continued government funding for the acquisition of global knowledge.

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