C E Center for Effective Organizations

New Organization Forms for Manufacturing Competitiveness II

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Abstract

The Center for Effective Organizations and Fiat have conducted a series of travelling seminars. This part of the series focused on organization forms for competitive renewal. This paper is a progress report on the second seminar. Companies visited were DEC, TRW, Northrop, Xerox and Hughes. The framework for the series was presented in working paper G89-3 (146).

New Organization Forms for Manufacturing Competitiveness II

The Center for Effective Organizations and FIAT conducted their second "traveling seminar" in order to study new forms of organization being used by manufacturing companies. As in the first seminar, the question asked to firms that were visited was "How are you organizing to be more competitive in the 1990s? This seminar visited and studied Digital Equipment, TRW in Cleveland, Northrop, Xerox and Hughes. This paper is a report of the learnings from the visits. The results from the first seminar are also available (Galbraith, 1989).

Framework

The framework guiding the study is the "From Recovery to Development" model (Galbraith, 1988). The earlier paper describes the forces of global competition. In response to these forces companies have responded initially by recovering the competitiveness of their core businesses. After reductions in the number of employees, the companies use consolidations, integrated-responsiveness, vertical disintegration, employee involvement and finally continuous improvement as strategies for recovering quality and cost competitiveness.

Next the core businesses are extended globally. Companies are simultaneously placing more value adding activities in different countries and integrating these activities more closely together into corporate-wide programs.

Finally when their core businesses has sufficiently recovered and are generating more cash than can be reinvested in them, managements' priority shifts to development. These companies seek growth markets like technology, services, software and systems integration. New sources of revenue drive the company rather then downsizing. The organizations that are being used to implement these strategies are several. First there are overlay organizations for business units and functions and for business units working across countries. The network organizations is another form that is used for both business units and the corporate headquarters. At the corporate level hybrids of the standard functional, divisional and holding companies are evolving. And finally the most different organizational forms are used on "green field" sites when the company starts fresh in building a new plant or division. These innovating organizations are laboratories which then spawn similar changes as people move from the green field site to the traditional organization. In the next sections the companies are each described with respect to their strategies and to the organizational changes that they are using to implement these strategies.

Digital Equipment

Digital is an example of a Western manufacturing firm for the 1990s. Hardware products are accounting for less of the value added while software, services, consulting and systems integration will account for more. These changes along with the shift in power to the buyer due to global competition are driving DEC to develop "an unwavering commitment to the customer." They are trying to become partners with their clients in designing information systems. These new systems are total solutions to the customers' problem. They are selling "Total Engineering Environments" to the Vice President of Engineering. Changes to their corporate organization reflect the above changes in both their specific business and the global marketplace.

Digital had always been a technology driven, engineering dominated company. Product Development groups introduced leading edge products like distributed computing to departments as an alternative to centralized company wide systems build around mainframes. The product lines were the profit centers. However, the shift to a systems sale and increased value added in software and service,caused DEC to shift the profit and loss responsibilities to geographical units in which sales, service, customer education and so on are managed. While DEC continues to innovate technologically, the company is being more customer driven. The result is a dual organization. One part is "Old DEC." This part is engineering, manufacturing and product marketing. They are organized around product lines. The other part of "Old DEC" is the software organizations for operating systems and generic applications like Desk Top Publishing, CAD/CAM and so on. The software organization also has responsibility for recruiting independent software companies to write applications which run on DEC equipment.

The other part of the dual organization is the interface to the customer. The organization is geographic and functional. Countries and regions are the building blocks but Sales, Service, Administrative functions form and matrix organization. Indeed DEC is a heavily matrixed company. There are product lines across functions in the old DEC and functions and geography in the new DEC. The new DEC has been growing rapidly as the business has been moving closer to the customer. New activities are also growing on this side. Industry Marketing and Major Accounts need to be coordinated across geographies like applications are coordinated across product lines and geographies. They focus on industries that have enough volume to justify unique products and particularly software products. People from these industries have been hired into these units. Like many Western manufacturing companies, DEC is increasing the influence of the market or industry focused units. Major Accounts is yet another cross-country coordination activity. About 20 some companies like FIAT and Philips are global accounts that are singled out for individual attention. Thus the company is organized functionally and geographically. Profits are accounted for on a geographic basis. But across these organizations are overlays for products and product development, applications like CAD/CAM, industries like financial services, and major accounts.

Digital has had a lot of experience with matrix or overlay organizations. Like others they have given up on the international matrix. Time, distance, language all make it too difficult. But within the U.S. and Europe, the matrix is carried out. Global products are developed with the Engineering organization which is organized world-wide. That is, the engineering organizations in Italy and France work for engineering managers, not country managers.

Several reasons are given by DEC people as to why matrix works at Digital. It is claimed that DEC started like an academic institution and has always had values of openness and shared information widely. Political behavior is shunned at DEC and politicians do not last long. The management population has been fairly stable and relationships have grown up. Openness is easier and political behavior is less likely when a company is growing and is successful. DEC however has had its difficult times as well. Its functional orientation creates barriers as well.

Increasingly Digital relies on its distributed computer network to maintain communication across interdependent groups. Currently, 30,000 computers are on the network along with 50,000 terminals. They talk about their organization like they talk about their computer networks. The organization is "distributed" and they use "virtual teams." That is a person is a resource to be included in an effort independently of where the person is located. The teams are linked by terminals on the network.

Currently Pan-European efforts are being distributed. Each country gets a mission but is responsible for the mission on a Europe-wide basis. Industry Marketing is the example. Financial Services is in London, Aerospace Manufacturing in Paris, Public Service in Brussels, Automotive in Turin, and Manufacturing in Munich. Rather than form a centralized unit in Geneva for DEC-Europe, they distribute the central missions to the field. The distributed field units must both supply and receive industry marketing guidance.

A similar approach is used to design work. DEC competes in an industry faced with a world-wide shortage of electrical engineers. Israel has a surplus. DEC has a design center located in Jerusalem. French engineers are attracted to the south of France and the French are offering tax incentives to locate in industrial parks in Valbone. The Swiss are offering similar incentives to locate in Neuchatel. In India, one can find capable low wage software programmers. In order to capitalize on these situations, DEC's policy is take work to the people. Then they integrate the work through the world-wide computer network. They also use quarterly engineering councils to bring people together.

In distributing company-wide missions and taking work to the people, DEC is setting the pace for 1990 organizations. The forces of global competition and active demanding host governments will produce more distributed missions. World-wide demographics will cause companies to search for talent world-wide. Computer networks and tele-computer networks will increasingly tie together the physically fragmented company.

Digital-Enfield Plant

The Enfield plant is an example of a start-up where a new organization form was created from the beginning. The plant is run by self-managing work teams with no first-line supervisor. Each team produces a whole product (a printed circuit board). These product lines are produced at the plant. About 150 people work on the teams. A manager is responsible for each product line. There is a plant manager. Combined there are only three levels of hierarchy at the plant. About 130 technical and administrative people round out the total population.

The plant is designed to be flexible and fast acting. New products are introduced first to Enfield and then to volume production in Singapore. The teams designed their own workplace and still select equipment and work procedures for new products. The teams do their own hiring and firing. Teams meet daily to plan their work and make decisions. Each team member is required to do all jobs and know how to build the complete product. In addition, they are incented to learn the technical features, administrative procedures of the business. The compensation system is one of skill-based pay. The more skills a team member learns the higher the pay is. The team decides what skills it needs and when someone is qualified. The whole system is meant to promote learning, adaptability and change.

There are no appointed or selected team leaders. Whoever has the skill for the situation provides the leadership. Teams interact directly with engineers, customers and vendors. The management at Enfield are enablers. They assist teams in whatever way they can to enable teams to produce. The information flows to the teams. They have access, through DEC's network, to business plans and strategies for their product lines. Change is easier because the teams know it's coming. The team can influence the change and have the responsibility and incentive to learn. Change is a way of life at Enfield. People who thrive on change are selected and choose to remain. The organization is designed to be flexible and manage change.

Hughes Aircraft

Hughes is currently going through two major sources of changes to its organization. The first is the role of corporate headquarters. The second is the role of manufacturing in the decision process.

Hughes has always been a fiercely decentralized company. Decision making has always been decentralized to the group level. Even in some groups, decisions have been further decentralized to individual divisions. Within a group or within a division, Hughes operated with a matrix form of organization. One of the changes they are making is to decentralize further the level at which the matrix is operating. So many of the groups are pushing the level of matrix down to lower levels. They are forming smaller decision making entities at the division level. However, as they form smaller divisions, they are increasing the leadership role that the corporate headquarters takes. Headquarters has always been quite passive in its relationship to groups or divisions. Currently, the corporate units are taking leadership positions on issues such as computer aided design and total quality and the individual units are following in using the staff groups. There has been no large increase in the number of staff people in order to do this. The main change is the strength of people that are being placed in the role of corporate staff.

The changes are being driven by the new defense environment where the defense firms must invest some of their own capital and R&D. Changes are also being driven by increases in the amount of capital and R&D that is necessary just to compete. In order not to duplicate these expenditures, Hughes has been increasing the participation of the Corporate Technology group in the Research & Development budget. They have been forming centers of excellence where they use a lead division for a particular technology. That division then has the responsibility to share that technology with people from other divisions. These centers of excellence are also centers where there is joint staffing from various divisions that are using that technology. In this way, the Hughes organization is assuming the distributed form of organization, like Digital has been using. The change shows a greater willingness for the corporation to eliminate redundancies, to designate particular areas to take the lead, to use joint staffing and finally to use the budgeting process for joint decision making. The corporate staff at Hughes is about 1,200 people. A lot of these people are in the

The corporation's contact with General Motors is primarily on projects with the Delco Division of General Motors, General Motors Research Center and the Tech Center in Detroit. EDS participates on some of these projects. Otherwise, the primary linkage between GM and Hughes is the interchange of a few people, or on some consulting explorations.

The other major change at Hughes is the increase in the level of influence in manufacturing. The change results from a loss of business to Raython and other more cost oriented companies. The military customer is basing decisions on cost of equipment much more than they did in the past. Hughes had always been known for high performance and very high priced equipment. Currently, Hughes has made an effort towards design for manufacturing. That is, they design equipment for ease of manufacturing and low cost. They also are trying to apply their own technology to the manufacturing process. Engineers recognize that higher levels of technology are also needed in the manufacturing process. They recognize that higher levels of technology are needed in the process of making semiconductor chips. All of these recognitions have caused Hughes to increase the level of influence of Manufacturing within the company. The influence has been increased by staffing the Manufacturing corporate staff unit with higher level people, by raising the level of manufacturing within the group structure, and by making Manufacturing Engineering part of the rotation process for newly hired engineers. In general, the staffing of the

Manufacturing Engineering unit has been increased to assume a level of sophistication with the design engineers.

Hughes has followed the usual progression of steps that manufacturing companies have followed. They have begun a number of programs to increase the quality level of their products; next they have introduced "just in time" manufacturing, employee involvement, statistical process controls and so forth. Hughes started in about 1981. They did some studies. They used steering committees and task teams and brought in consultants. Their efforts began seriously in 1984. The customer closed their plant in Tuscon, Arizona for seven months before they would accept any product that was coming from that plant. They then started using seminars from Duran and Demming and began statistics courses for all operators. They originally had two programs. One program for quality, and one for productivity. They found that they were actually the same course. They now have a belief that quality touches everything and is their vehicle for making cost improvements. They are seeing that quality affects virtually everything in the plant. Hughes's version of these programs is continuous measurable improvement. They are finding that the easiest way to introduce these new programs and overcome the skepticism of the managers is to use cycle time and cycle time reduction as the driving force. That is everyone can recognize time as being an enemy. People believe time is money. Time is measurable. In this way, everyone can focus on reducing total time to manufacture. Cycle time reduction ultimately leads to less defects, less costs, fewer set-ups, just in time, employee involvement, work teams; all of the organizational changes that companies are trying to implement.

The real power of the cycle time reduction is seen in its effect on the decision making process. The decision process becomes a real time feedback system. The problems surface immediately. The cycle time is reduced and the problem emerges. At that time everyone has to focus on the line which has stopped. The problem then becomes the team builder. The problem affects the priority for every department that is concerned with the manufacturing unit. The result is that everyone has the same priority. The result is that you must use employee involvement to stop the line and to participate in the decision process around the problem. It focuses all of management downward towards the source of the problem. Manufacturing Engineering must work with the people on the line. The system itself becomes a real time problem solving system. It sets everyone's priorities to be identical and causes them to work together in a crisis atmosphere.

All of the companies that were visited used just in time or cycle time reduction as being a step by step process for converting organizations to employee involvement because you have to have employee involvement with low cycle times. They saw it as a driving force for increased quality because you must have good quality to make a just in time system work. They saw it as a means for changing the philosophy and thinking of the entire organization. It absolutely demands lateral communication across departments. It moves decision making to lower levels of the organization. It forces the management structure to focus on the line and on the first level of activity. It forces management to be a support activity, in fact. The problem of a stopped line absolutely requires it. Before, different departments could choose different problems to work on. Now, the problem calls the tune. The stopped line forces an alignment of priorities. So in summary, the just in time or short cycle time manufacturing actually forces and drives management to behave in the ways that most companies are desiring management and departments to actually behave.

Northrop Corporation

The Northrop Corporation, like Hughes, is going through a period of downsizing and consolidation. Northrop had doubled in size between 1980 and 1986. They went from 27,000

employees to 50,000 employees. Currently, they are at 46,000 people. Their sales increased from 1.5 billion to 6 billion dollars. Their corporate staff is about 500 people.

The autonomy of the divisions is diminishing over time. Initially they had four aircraft division and six electronic divisions. There was a group executive between the aircraft and electronic divisions and the corporate staff. Currently, they have no groups and have combined divisions into six in total. Many of these reductions were to lower the overhead cost with a consolidation that is taking place in the defense business. Some of the combinations were to meld and combine technology. They regarded themselves as being overly decentralized. They are now increasing the reliance of divisions on other divisions. Like Hughes, they are using lead divisions on key and expensive technologies. Resources of divisions are to be available to everyone. People are moving across divisions. Joint staffing of centers of excellence is being used. Another feature is an increase in the oversight responsibility that is exercised by the corporate staff.

The aircraft division was the focus of discussion. This division is the parent division of all of the other Northrop divisions. It currently manufactures two thirds of the fuselages for the Boeing 747. It manufactures the center and aft sections of the F18 for McDonnell Douglas. It also supports in various ways the manufacture of the B2 by another Northrop division. But increasingly, the focus of the aircraft division is on the Advanced Tactical Fighter (ATF). The ATF is a start-up operation and Northrop is currently competing with Lockheed for the manufacturing contract.

The aircraft division is a matrix form of organization. Reporting to the general manager are functions of engineering, manufacturing, quality, human resources, product support, material and so forth. Also reporting to the general manager are program managers. There are program managers for the ATF, the F18, the 747 and some secret programs. The ATF is currently organized as a self-contained start-up. That is, all of the manufacturing engineering, quality, purchasing employees who are working on the program are all co-located in one place. They act as if they work for the project manager. Once the design and manufacturing begins, these people will move back into working in a matrix kind of relationship.

The biggest driving force on the organization is the move to fixed price contracts. They are learning how to do fixed price development work. Before the development work was cost plus, while the manufacturing was fixed priced. Another change is the increasing use of firm fixed price contracts. A firm fixed price means that there will be no change in the scope of work during the actual performance of the work. Before, the contractor would underbid to get the work. And then he would make changes that the customer wanted after the work was obtained and the contractor was the sole source. Now, each request by the customer must be negotiated and changes made without changing the contract price. Like Hughes, Northrop is also facing participation in product development and capital expenditures. That is, the contractor must pay some portion of the development work before ever receiving a contract. All of these changes increase the risk and the cost to the individual contractor. In turn, the contractors are consolidating, eliminating duplication and centralizing the decision processes.

Northrop, like many of the defense contractors, uses a new project as a means of introducing major changes. The ATF is currently serving that purpose for them. With a new project, the company gets an opportunity to start with a clean sheet of paper and introduce many changes. On the ATF, Northrop is attempting total quality management, work in teams, and simultaneous engineering as the primary changes. The goal of the changes on the ATF is to get more of a business focus. The leader of the effort to design the new organization was chosen because he was not a computer person. They are trying to use

the CAD/CAM system and shared data bases as the key means for linking all of the functions together on the simultaneous engineering efforts. All of the subcontractors are also linked together on the new data base. The attempt is to use CAD/CAM as something more than automated drafting. They are trying to use the computer as the basis for concurrent design or simultaneous engineering. As many people as possible are co-located together. The effort on the ATF is to change the organization around business processes. The three business processes are seen as product definition, product delivery, and product support. These three processes constitute different stages of the life cycle of an aircraft. All of the functions contribute people to the product definition stage. All of the people are collected together physically by major sections of the aircraft. That is, everyone who works on the fuselage, the tail section, the wing, the avionics, the engine, etc., are all physically located together. People still work in their function, but receive a great deal more direction from the project manager and sub-project managers for each of these individual sections. During the actual design and manufacturing, people will receive more direction from their functional managers. The primary attempt at change on the ATF is to integrate all of the computer systems. Currently, they have one for CAD/CAM, total quality management, the material requirements program, and their financial systems. All of these need to be integrated into a single business oriented process, and then shared across all functions that are participating in the various processes.

Northrop is also creating a new corporate unit for material and major subcontracts. They are noticing that there is an increasing percentage of outside purchasing on their contracts. In addition, they are entering into teaming relationships. That is, Northrop is teamed with McDonnell Aircraft on the ATF. Both of these contractors are "prime" contractors or "systems integrators." Before, a prime or systems integrator worked with different levels of subcontractors for the engines or the landing gear, etc. Now, they are teamed with other primes and co-manage the entire effort on the ATF. These teaming relationships are also driven by the fact that a single company can no longer afford the capital or R&D investment to compete on all programs. The role of the new material and major subcontracts staff is to oversee this new activity, to see what has been learned and to determine what Northrop can do to manage teaming more effectively. The teaming arrangements are very similar to joint ventures and strategic alliances for commercial firms. The teaming arrangements are cooperative arrangements with multiple prime contractors. Usually one of the primes may be designated as the lead prime. But even here, there are still problems in the joint design because each contractor has his own idea and philosophy about how to design aircraft.

Northrop has been using onsite teams at other primes with whom they worked on the B2. Boeing and McDonnell Douglas have people here at Northrop. Northrop has people physically located at Boeing and McDonnell Douglas. The main source of coordination is in the electronic interfaces. Increasingly, the design and production control people all share a common data base and a common CAD/CAM system. Each of the subcontractors is asked to use a personal computer or terminal, using the same system as Northrop. So it is increasingly important that all participants on a program all use the same equipment systems or compatible network.

Another change is the change in philosophy and how to treat subcontractors. They are now looking for changes that they, Northrop, can make to make life easier for the subcontractor. They have noticed that many problems at suppliers are caused by Northrop itself. Northrop has made errors and given ambiguous directions. They now say that if they can improve their own quality and increase the stability of their own requirements, they will get better performance and lower cost performance from the suppliers. So they are

taking the lead in trying to manage the network of suppliers for the benefit of the customer, of Northrop and of the suppliers themselves. This is another example of the increasing amount of penetration in the supplier network by the prime contractor itself.

In summary, Northrop is typical of the defense contractors that are entering a period of recovery. They are consolidating, reducing costs, using simultaneous engineering, using work teams, using more subcontracting, using more teaming kinds of arrangements. These changes are driven by the change in the requirements of the customer. The military customer is currently shopping for lower cost material. They are using firm fixed price contracts. They are demanding that the contractors invest their own money. The result is that contractors are faced with increased competition, increased risk and increased investments in capital and R&D. No one contractor can afford all of the investments that are necessary. Teaming and alliances are the increasingly desired means of handling this increased risk and investment.

Xerox Corporation

Xerox is an interesting company, primarily because it is the only U.S. company that has won back market share from the Japanese, once having lost it to them. They have done this by reducing costs and reducing numbers of suppliers. Their main change program was begun five years ago with the new chief executive officer, David Kearns. The company had become complacent after many years of monopoly. The Japanese competition and the new digital technologies are the primary forces for change. Currently, the Xerox change program is called customer obsession. That is, they believe that if you satisfy the customer, profits and other successful things will follow from that. They are also measuring themselves on return on assets. They are aiming at a 15 percent return on assets. Everyone in the company is being measured in some way on the return on the assets that their unit employs. Finally, they are focusing on technology to achieve product leadership.

Xerox has just reorganized in the last couple of months. The reorganization was driven by changes in the technology and changes in the strategy of the company. The technology is moving to digital forms of document processing. Xerox must conceive of itself as not just a copier company. They are supplying electronic printing systems, electronic typewriters, optical scanning equipment, local area networks, desktop publishing, electronic publishing and facsimile. All of these are means of active documentation. So Xerox conceives of itself today as a document processor. The structure change that they made is typical of a number of organizations that have reorganized around markets. That is, all of the sales and service units for the product divisions were combined into one marketing and customer operations unit. A second part of the organization is still organized by product. This other part of the organization is the product development and manufacturing activity. Also, there is a corporate research activity which is the third leg of the Xerox document processing organization. The new structure is like that described earlier for DEC.

The change process started in 1982 at Xerox. The change was driven by the leadership through quality program. The program started with training in groups with a manager and that manager's direct reports. They started with the CEO and his direct reports and have moved through the entire organization. Each manager attends two of the sessions; once, as a subordinate with his boss, and once, as a leader with his subordinates. All 100,000 people at Xerox went through five and a half days of training. Usually 20 people at a time or two groups at a time went through the same training.

The training started with a half day of a group team building session. This was followed by two days of training in problem solving processes. Part of the emphasis was on the group process for arriving at group decisions. Another part was on individual

interactive skills. The result was that everyone in the organization has now been trained and uses a common problem solving process. This common process and language is typical of changes in management processes at Xerox. Before, Xerox was a collection of entrepreneurs, each of whom would go their own way. Now there is an emphasis on standard ways of doing things and a better means of communication across groups. The last three days was on the quality, quality skills, and new role of the manager in these processes. A typical course taught statistical process control. They taught total quality based on the assumption that everybody has a customer. Xerox also has introduced concepts of benchmarking and customer surveys.

The benchmarking processes are something for which Xerox is quite famous. What they will do is to choose the best company that they know for a particular management process. For distribution, they have chosen L.L. Bean as the best distributor. They then exchange information with L.L. Bean and compare their own distribution activities with L.L. Bean as the benchmark. The benchmark company will supply information on inventory levels, numbers of stock outs and total number of days to respond to a customer request. The compensation and performance measurement of distribution within Xerox, then depends on how well they meet the benchmark goal vs. L.L. Bean. They have selected Nordstroms as the benchmark for customer satisfaction. In order to determine customer satisfaction, Xerox surveys their customers on a monthly basis. The field people are measured and rewarded based on these surveys. The survey goes to the decision maker at the customer site. Once a year, they survey their competitor's companies. They use the competitor's customer satisfaction as a benchmark also.

Xerox has also undertaken another series of changes in order to satisfy the customer and to win back market share from the Japanese. One of these changes has been the product delivery process. Here the attempt has been to reduce the time that it takes to deliver a product to market. They initially started a task force analysis of their entire process. They compared themselves to their joint venture, Fuji-Xerox in Japan. A lot of the changes that they have adopted are modeled after the process at Fuji. The attempt is to increase quality, decrease the cost and decrease the delivery time in the product development process. So far they have been successful at increasing the quality and decreasing the cost of the product. They are still working to reduce the delivery time. Currently, their benchmark for a new product, which is a copier, is 24 months.

The changes made so far have been to use a product team, which they have always done, and to assign a chief engineer to act as a leader of that team. The chief engineer stays with the project during its entirety. The product engineer is the person responsible for the quality of the product, the cost of the product, and the total delivery time. Like other manufacturers, manufacturing is joining early in the process and stays continually throughout the process. There is no hand-off from engineering to manufacturing. The team remains constant throughout the delivery process. That is, an individual from each function acts as the product core team. These people are dedicated to the effort from start to product launch. On these teams are also representatives from Fuji Xerox and Rank Xerox. Their task is to input customer and manufacturing requirements that will be used in the Japanese and European markets. They will have to design and build products anywhere in the world. They want common processes to serve as integrating devices across areas of the world and across functions.

Another effort at change is the concept of team Xerox. They want to move from individual efforts to work teams. From work teams they want to move to cross functional teams. Finally, they want to incorporate teams as a way of life, as a way of doing business. This is a major change in style for Xerox and it means emphasizing team work. They are

trying to promote people on the basis of their team behavior. They are trying to select managers on the basis of a manager functioning as a facilitator, as a counselor. In order to promote the team spirit, Xerox has a "team" day. Each unit in Xerox selects its best example of team work. All of these people, who are selected, present their results of team work to the chief executive at the Greenbrier Resort. Originally, an award was given to the best of these teams. But most of the people who did not receive an award became disappointed. Currently, all of the teams selected from their work units present their results and are given an award. Another method of team work are local team days where teams set up booths and all of the families come and visit. The booth is a presentation of the team's activities and accomplishments.

Another program is the innovative team process. An individual is encouraged to notice an opportunity for improvement. These improvements may involve work across a number of different functions. The individual who sees the opportunity can create a team and propose to the senior management the program and the budget for accomplishing the change. The senior managers can approve the proposal, the budget and the staffing. The individuals then become responsible for accomplishing the changes. All of these proposals are activities over and above the normal workloads for these individuals. A number of the teams that are chosen to represent work units at the Greenbrier, come from these individual initiatives.

One of the changes that Xerox has made has been in its field organization. The field organization consists of the service and repair people, the sales representatives, and the administrative unit. Before, there was a district manager who supervised these three units. Xerox has eliminated the district manager role. There is a district manager for services, one for sales, and one for administration. All three of these people get a common review from the regional manager and are measured on common goals. The three people are to act collectively as if they were the district manager. They are compensated on a basis of 80 percent fixed and 20 percent variable compensation. The variable compensation is based upon the measure of profitability above the target profit for the district.

The role of the region is to support the district partnerships in serving their customers. The regional manager is measured and compensated on the number of districts that make their own partnership goals. Therefore, the regional manger is placed in a position of supporting the districts in order to make his own regional goals. Xerox calls this process one of empowerment. It is aimed at eliminating layers of management. It consists of having employees take responsibility, building in reward and recognition, and having management act as a supplier to help subordinates accomplish customer satisfaction goals.

In summary, Xerox has undertaken a large number of changes, all under the common umbrella of leadership through quality. The leadership for quality has been David Kearns's means for putting his stamp on the organization and for transitioning from the monopoly Xerox to a competitive Xerox. All of the changes are consistent. That is, each one is not a separate effort. All of the changes form a total package of meeting the customer's needs. Many of the changes are to the management processes, rather than major changes in structure. There has been a structure change. The change is to get a greater focus in the part of the organization which interfaces with the individual customer. Information systems, reward systems, promotion systems, training processes have all been changed in a way that have been consistent with the desired effort. The other significant change at Xerox has been the use of outside customer surveys and the use of the survey as a management compensation measure. A second major change is the use of benchmarking against excellent performers of particular tasks. These benchmark measures also are built into the measurement and compensation process for people inside of Xerox. Currently, Xerox is still

struggling to become effective. The Japanese competition, the changing digital technology are forces that are driving the change process at Xerox. Whether these are successful or not, still remains to be seen. The efforts, however, are very substantial and appear to be correctly motivated at making Xerox a more competitive company.

TRW

TRW is a company with about 7 billion dollars in sales. The company consists of three business areas. Electronics and aerospace is the largest, with about 3.2 billion dollars in sales. The automotive sector is next, also with about 3.2 billion dollars in sales and the new third business, information systems, with about a half billion dollars in sales. The information systems portion is the new part of the company and is their future growth area. These three business areas are all that remains of a major restructuring program. The energy sector and parts of the automotive sector have all been sold or closed. TRW had been a takeover target and the restructuring was intended to increase the stock price to avoid any future attempts at a takeover.

TRW presented the seminar with three areas of organization activity. One was the changes that were taking place at the corporate level of the company. The second was their program in employee involvement. The third was their program in Japanese manufacturing techniques.

The changes at the corporate level at TRW result directly from their attempts to restructure the business. They are reducing the number of staff people at the corporate level. Currently, they have about 500 people. The staff units are the usual corporate staffs, but at TRW there is also a technology group. TRW is constantly working to transfer technology across business units. The technology is seen as their value added within the corporation. TRW also creates temporary staff units. The employee involvement effort is one of these. They also created staff units for quality and productivity. The staff unit typically finds some managers who are interested in doing something like employee involvement and then they spread the use of it by acting as a central repository for experiences and ideas. Once the program is introduced and the managers begin to adopt it, the staff unit goes away; the activity that the staff was sponsoring then becomes a natural part of running the business.

The other major change at TRW was with the management systems. This change resulted from a greater need for strategic management. The strategic management effort was an attempt to integrate the strategic planning, the budgeting process, the monitoring and tracking of performance and the compensation and reward systems. Before, a different staff group had responsibility for each of these. Often, the numbers that strategic planning used were different than the controller or budgeting people used. The planning process starts with a strategic plan around groups. Each group has a worldwide strategy. There are 20 groups. These groups are the basic strategy centers or business units that are used in TRW.

TRW is taking the planning process off of the calendar. The plan is submitted whenever a strategic plan needs to be submitted. Some organizations may submit a strategic plan twice during the year. Other businesses may submit one every two or three years. About one third of them get reviewed each year. The attempt is to plan the fundamentals of the business according to the cycles through which the business goes and to remove the calendar as a basis for making decisions. The first year of the strategic plan becomes their operating plan or their budget. The operating plan is then the basis for the one year compensation. A compensation system was changed to put more of the compensation at risk. That is, the top management now have 50 percent of their salary at risk. If they make their target financial result, the bonus equals 50 percent of their fixed salary. The next 100 people in the organization have 40 percent of their salary at risk. The top 900 people have 25

percent of their salary at risk. The changes at TRW result from a two year effort. The primary focus of the effort was to highlight strategy, to link strategy to the budget and the bonus, to coordinate the Planning Department, the Controller's office and Personnel in making corporate level decisions.

The employee involvement effort at TRW started 11 years ago. Initially, there were a few managers who wanted to do it. But then, productivity became an issue. Employee involvement was seen as a means to improve productivity. The same emphasis resulted when quality became a major issue. Currently, competitive pressure from the Japanese is driving the effort at employee involvement. It is no longer a human resources program, but a means of running the business.

All plants at TRW have done something in employee involvement. Some plants have the sophisticated self-managing work teams like those that were described at DEC's Enfield plant. Others are just doing something like gainsharing. But increasingly, everyone is moving to team incentives, to team selection of co-workers and to training for the supervisors. TRW is continually evolving to egalitarian facilities. They are eliminating the executive dining room and assigned parking place and adopting open offices.

The TRW employee involvement staff has continually been given the story that employee involvement will not work here. That is, employee involvement started at a green field site. People then said that it would not work in Cleveland or in a unionized plant. Then they were told it would not work in Europe. Then they were told that employee involvement would not work with a French Communist union. Currently, employee involvement is being implemented at all of these places including a factory outside of Paris in cooperation with the CGT, the French Communist Union. There are also efforts in Germany using guest workers. The bottom line is that employee involvement has worked for them and is working quite successfully. The problems that have been encountered are usually not with the union or with the workforce, but with the middle management.