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**Center for
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Japanese Transplants

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ABSTRACT

In the 1980's the Japanese began a high level of direct investment in the United States. There was a great deal of interest in how successful their style of management would be outside of Japan. In circumstances where the Japanese used product or process technology as an advantage, they did not attempt to transplant their system into the U.S. However, in the automobile industry, the Japanese Production System is the advantage. This system has been transplanted almost in its entirety. By using a fresh start, the Japanese have built new plants, hired new workers, and moved to rural sites. These moves have allowed them to build an industrial relations climate like the one they have in Japan.

The experience with the managerial workforce has not been successful so far. They are having trouble attracting and retaining the best people. The managers have not been built into their system of management.

JAPANESE TRANSPLANTS

The Japanese have been investing in other countries quite extensively in the 1980s. By 1989, there were 672 Japanese manufacturing operations in the United States. In the U.K., there were 97 manufacturing operations. In this paper, the Center for Effective Organizations examines the success of these Japanese transplants and explores the reasons for that success or the lack thereof.

The Japanese, in the late 1980s, shifted their investment profile in the United States. Initially Japan recycled its trade dollars by buying treasury bills to help finance the U.S. trade and fiscal deficits. Next came a shift to the purchase of real property in addition to the buying of treasury notes. Finally, the Japanese began to invest directly in plant and equipment. There are reasons for this shift to direct investment. First and foremost is the threat of trade barriers applied to exports to the United States. The investments place the manufacturing value added behind the threatened protection barriers. Second, the change in the value of the Yen has made Japanese exports more expensive and U.S. manufacturing more cost effective. Third, some of the investments are to acquire technology that cannot be easily licensed. As U.S. high technology venture capital has been reduced, the Japanese have moved to replace it. And finally there is the trend toward localization (vs. globalization). Localization results from the combination of several forces. People are preferring locally customized products. These customized products

can be produced using flexible manufacturing techniques in which the Japanese have a lead. Customers also want fast to immediate delivery of the customized products and electronic order processing and payment. Together these forces favor local manufacturing situated close to the customer. In the future this fourth factor will be the most powerful. But up until now, the Japanese investments have been in their key export product lines and have been aimed at getting behind potential protectionist barriers.

These new investments raise some important opportunities for learning. Will the Japanese successfully adapt to other cultures? Or will they transplant their own management methods to other countries with non-Japanese workforces and labor unions? Can the Japanese production system work effectively in other countries? If the Japanese methods are successful, then they can be adopted and adapted by non-Japanese firms as well. Up until now the Japanese success has often been explained away by factors unique to Japan and Japanese culture. It was said that a docile workforce, cheap capital, government subsidies, planned cooperation among firms and government protection made Japanese industry successful. On the other hand, some scholars embraced Japanese management techniques and recommended them to Western managers. If Japanese management and organization techniques are unique to Japanese culture, they will be less successful when applied to other countries of the transplant operations. So what is the success to date?

Are They Successful?

There is some controversy about the success of the Japanese transplants both in the popular press and in research findings. First, there are some failures. The doubters believe that there are more of these failures, but we simply do not hear about them. The Japanese operations in the United States are private. The Japanese are not the kind of people that will admit failure easily and are very interested in "saving face." They are also interested in promoting the success and acceptance of their style of management. So some people believe that we only hear about the successes and therefore have a distorted picture of the actual situation. But even these people admit that the successes far outnumber the failures.

Another point of view is that it is too early to tell. Many of the Japanese operations are in a honeymoon period. It is believed that after awhile they will be just like U.S. companies and will have the same problems with unions that General Motors and Ford have today. There is an example of a Sanyo factory that was initially very successful in manufacturing television sets. Over time, their labor relations climate decayed and today there is some doubt as to whether the plant will continue in operation. But even in this case there is controversy. It appears that the plant was successful when run by the Japanese managers. After Sanyo turned over control to the American managers the situation decayed. The Americans apparently returned to the old adversarial relationship

with the union and a strike took place (Business Week, July 14, 1986, p.51).

Some recent profit reports also suggest that success in gaining market share has not been accompanied by success in producing profits. Nissan recently reported that poor performance in its overseas (U.S., U.K., Mexico) manufacturing operations held down its total profit for the year (Herald Tribune, June 1, 1990). No other specifics were given. So there are a number of reported examples of difficulty being encountered by the Japanese transplants. But even with these qualifications, it still seems that the Japanese transplants, in the United States and in the U.K., have been successful. The number of successes far exceeds the number of known failures.

The automobile industry is the one industry in which the Japanese have clearly shown superior productivity and quality. Cars at Japanese transplants average \$700 per car less than cars produced by the Big Three. Their quality is 1.2 defects per 100 while the Big Three has improved to 1.6. The production from the transplants is increasing the Japanese market share in the U.S. One Japanese import is replaced for every 2 cars produced in the U.S. Clearly the Japanese auto transplants are achieving superior productivity when compared to U.S. plants managed by the Big Three (Wall Street Journal, Feb. 16, 1990).

Why More Productive?

There are several explanations as to why the Japanese transplants are more productive. These explanations are discussed in general first. Then the analysis focuses on the auto industry in particular.

One of the most popular explanations is that the Japanese activities have largely been start-ups (Bowman and Caison, 1986). In the United States, up to 1985, nine out of ten operations were start-up operations at a green field site. Currently, the number of start-ups are running at about two out of three. These start-ups allow a fresh start. They allow the company to begin with all of the knowledge of the previous failures. The companies select a young, malleable workforce that is largely white and non union. They pick an ideal location and size of operation. The start-up can also employ the latest technology. Given these advantages of a fresh start, the Japanese have been able to avoid the mistakes of the indigenous local companies and to adapt to new realities that existing companies with existing unions and locations cannot. There is clearly some merit to these explanations. The start-up with a clean sheet of paper does give significant advantages to the Japanese entrant but not always.

There are some examples of successful entries being made through acquisitions. Whether entry is made through acquisition or through start-up depends on the type of competitive advantage that the Japanese firm is using (Kujawa, 1983). Three types have been identified. Process centered advantages are used by companies like

steel manufacturers. These firms possess production process equipment that give significant cost, yield and/or quality advantages. The production organization and labor costs are less critical. Hence these companies buy existing U.S. firms. They are less concerned about unions and Japanese style industrial relations. They place a few key executives in finance and engineering as well as the CEO to secure their interests.

A second type of advantage is a product centered advantage like in electronics. Again the companies with product advantages typically are less concerned in implementing Japanese style of management practices. It will use acquisitions to get a plant, distribution and customers. In most cases major components and sub-assemblies are supplied from Japan. These firms do not resist unions. Labor costs are a minor portion of total cost.

The third advantage is a management system advantage like in automobiles. In this case the system of management and its industrial relations policies are seen as advantages. These firms always use a start-up and build their own organization. This organization specifically embodies the advantage in the people and the industrial relations practices. With the exception of the Toyota-General Motors joint venture (NUMMI), all of the Japanese auto companies used a start-up entry.

The Japanese use the advantage of a fresh start very well. They are strategy innovators. Rather than "play the game" by the existing rules, they fundamentally change the game so as to disadvantage the current leaders. During this period of

deregulation, technological and political change and globalization, the new entrants have the opportunity to establish new rules of competition which favor them and disadvantage existing competitors with existing plants and organizations designed for the old rules. The Japanese transplants have been successful because they have been strategy innovators with a clean sheet of paper.

There are four aspects to strategic innovation used by Japanese companies entering new markets (Prahalad and Hammel, 1989). The first is using the fresh start to change the rules of competition that was mentioned above. Canon vs. Xerox is an example. Twenty years of patent protection allowed Xerox to build a reputation, a brand name and a sizeable field sales and service organization. Their field organization and the installed base on leases were major barriers to entry and sources of large profits. Playing by Xerox's rules, IBM failed in its entry in the copier business. Kodak competes only at the high end. Canon refused to play by Xerox's rules. They entered at the low end where Xerox had no products. They used distributors for their sales force. They designed their products to be simple and reliable. The products did not need repair. They sold rather than leased the equipment. Xerox was unable to respond. Its large profitable field service organization and lease base which were barriers to entry became impediments to change under the new rules of sales of reliable products which were sold.

The second aspect of strategy innovation is to seek gaps in product lines as the first entry point. Like Canon, Japanese auto

manufacturers entered in the low end of the market where U.S. manufacturers were not interested. In Italy, they entered the "off road" or four-wheel drive sport vehicle market. They entered uncontested in a gap left in the market by the industry leader. The leader is less likely to respond or retaliate in a market in which it has little interest. From the gap, they learn the market and the competition. They then establish a base in the gap from which to launch the attack on the larger market. The third aspect of innovation is the continual addition of new types of advantages. Today a competitive advantage does not last long. Strategy innovation is building advantages faster than competitors can copy the old ones. Initially Japanese auto companies traded on low labor and capital costs at home to enter the low end of the market and still make money (figure 1). Next they worked to establish total quality through the organization which gave customers real value and further lowered costs.

Next they listened to customers and added features that customers wanted. Then they used simultaneous engineering to introduce numerous new products in half the time that Detroit could. Now they are investing in flexible manufacturing plants which allow customization to local markets. Western companies are left with a continual process of "catching up." Most western companies are working on total quality and simultaneous engineering. When these are achieved, the western companies will have improved but will have not gained advantages because everyone

else has improved also. So it will be "off to mass customization" for the next strategic initiative.

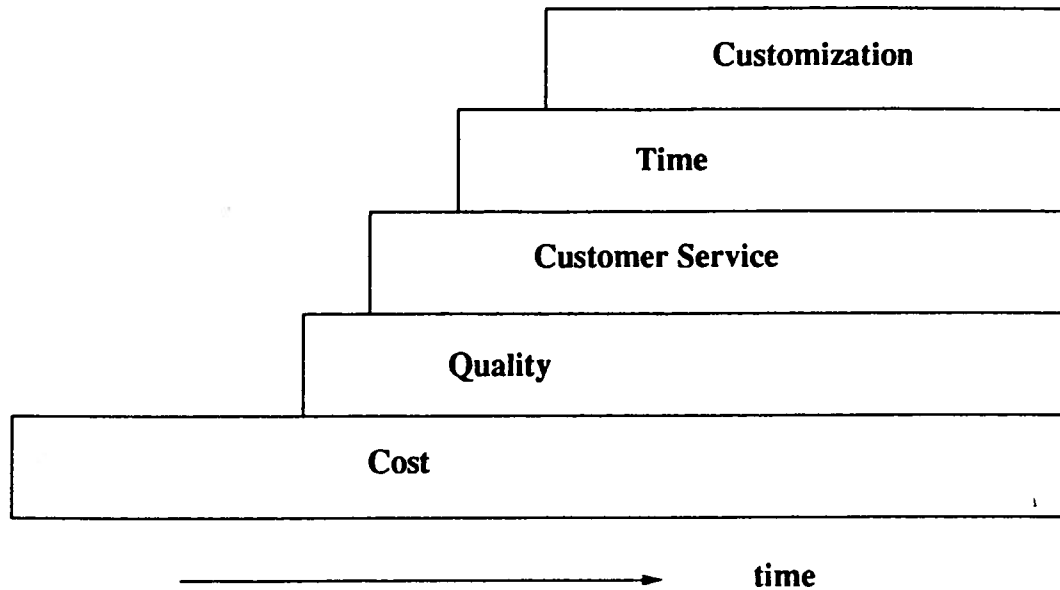


Figure 1

Fourth, the Japanese compete through collaboration. They form joint ventures initially with a competitor and provide components. Next they provide components to other parts of their partner's organization. Chrysler is now almost dependent on Mitsubishi for motors. From the joint venture they can learn about the progress that their partners have made in total quality and simultaneous engineering. They will learn how their partner competes and the partner's willingness to fight. The partner can learn too but the company needs to value learning. At General Motors people from

NUMMI are not necessarily valued in other parts of the company. More of them have left to sell their knowledge to other companies as consultants.

Thus, the Japanese have used strategy innovation to their advantage. They use a fresh start to change the rules of the game in their favor against the industry leader. They enter in an uncontested niche, build a base and expand to the real market. From initial advantages, they create a stream of new ones to maintain advantage as the competitors copy the old ones. The competitors' progress is monitored through cooperative arrangements which they see as just another form of competition. The successful application of this form of competition vs. the industry leaders who were wedded to their success formula explains some of the Japanese transplants successes.

There are also some other explanations as to why the Japanese subsidiaries are successful. One is that the Japanese transplants, vs. the European transplants are part of a global network. When Philips established operations in the United States, it purchased ongoing activities. It then established an autonomous subsidiary within the United States and perhaps placed a controller from the headquarters in Eindhoven. But for the most part, they left their operations to be fairly autonomous. This is not the case with the Japanese. Their operations in the U.S. are part of a global network of activities. They get significant help from headquarters. They are staffed with a number of Japanese expatriots who form a shadow organization. That is, the top seven or

eight positions in the U.S. subsidiary are often staffed with Americans, but they are duplicated by a number of Japanese who communicate or coordinate with Tokyo. For example, there may be an American Chief Financial Officer. But there will also be a Financial Controller from Japan as well. This person's task is to coordinate between the Chief Financial Officer of the Japanese parent in Tokyo.

Still another reason for the success of the Japanese is the numerous incentives that are provided to them by states in the U.S. that have significant unemployment problems. Both Kentucky and Tennessee have given quite significant advantages to Nissan and Toyota in locating their plants in those states. They have provided tax breaks, subsidies, and various infrastructure investments in order to attract investments of the Japanese. These same opportunities may or may not be offered to U.S. or European firms who are closing plants.

Another reason for the success of the Japanese companies can be attributed to their access to low-cost capital. They still pay one-third to one-half the price for money that U.S. and some West European companies pay for their money. The companies are also assisted by the banks and trading companies when they come to the U.S. For example, Toyota is aided by the bank from its banking group in attracting all of its parts suppliers to locate in Kentucky as well. The banks also make loans to American companies in the same industry. From their point of view, the banks can

identify successful supplier organizations and possible acquisition candidates for the Toyota company.

In summary, there are a number of reasons that are identified as to why the Japanese transplants have been successful in the U.S. It is probably true that all of these factors play a part in establishing the success of the Japanese company. One of the key factors must be the start-up nature of many of the Japanese operations. The advantage of a fresh, clean start selection of young employees, and investment in new technology is enough to give them substantial advantages over existing competitors in a marketplace.

The Automobile Industry

The automobile industry is the best case for testing the success of Japanese system in the United States. There are 8 plants in the U.S. and 2 in Canada. They have been placed there in the 1980s. So the industry has a longer history than most others in order to observe performance.

The popular press has clearly declared that the automotive transplants are successful. For example, a Business Week cover story appeared with the title "Shaking Up Detroit: How Japanese Car Makers are Beating the Big Three on Their 'Own Turf' (August 14, 1989). Fortune Magazine was next with an article entitled "Why U.S. Car Makers are Losing Ground" (October 23, 1989). And finally The Wall Street Journal placed an article on its front page under the title "Losing Ground: Auto Industry in the U.S. is Sliding

Relentlessly into Japanese Hands" (February 16, 1990). They all note that the Japanese have built 8 plants and Chrysler and GM have shut 8 plants. Currently 22% of all cars manufactured in the U.S. are made by Japanese transplant factories. The forecast is that the number will increase in the 1990s.

This success was not what the U.S. government had in mind when it set quotas for Japanese imports and threatened stronger protectionist moves like local content rules. It was widely believed that if the Japanese produced in the U.S. under the same conditions as the "Big Three", they would lose their cost and quality advantages. Instead the Japanese plants have maintained their cost and quality advantages even when using U.S. labor.

In part, the Japanese are not competing under the same conditions as the U.S. auto manufacturers. The transplants have the advantage of starting fresh and they are using it to their advantage. Most of them locate in rural areas where people have a strong work ethic and are non-union. They hire young, flexible workers. As a result their wage, pension and health care costs are lower than those of the U.S. auto manufacturers using older unionized workers. The new plants are more efficient and use the latest technology. Many of the plants were given attractive incentives to locate in states seeking jobs. The state of Kentucky will pay \$280 million over 20 years to attract Toyota's factory.

The transplants are also effective because of some product advantages over U.S. manufacturers. The U.S. auto manufacturers lag in engine technology. The Japanese cars are also designed in

Japan to be more manufacturable. That is, their cars are designed to be easily assembled with less labor. The components often come from Japan or increasingly from Japanese suppliers who have moved to the States.

Even when using American suppliers the Japanese treat them differently than the Big Three. Suppliers found that the Japanese rejected parts that U.S. manufacturers would accept. For those suppliers that qualified, the Japanese worked with them to improve their quality, shared information and established long term relationships. The U.S. companies traditionally negotiated at "arms length", bought on price and switched suppliers when prices were lower. The price negotiations were equally shocking.

When a supplier got a contract from the Big Three, it usually contained an escalator clause to raise price along with inflation. If the part costs \$1.00 in year one, it would increase to \$1.04 in the second year. Not so with the Japanese producers. If the part cost \$1.00 in year one, then it will cost \$0.96 in year two from cost reductions and improvements. The Japanese would also help the supplier find opportunities for redesign and cost improvement.

Quality turned out to be the most difficult issue. The Japanese were very strict in accepting parts. They visited the plants of the supplier. They inspected not just the parts but the processes for manufacturing them. Both product and process had to pass their tests.

In summary, the Japanese have entered the U.S. but have chosen to use their fresh start to change the rules of the game. They

have implemented their way of building cars rather than using the traditional U.S. way. They have started with new plants, new equipment, new locations, new workers, and new suppliers. When using old U.S. suppliers, they have converted them to the Japanese rules.

Japanese Production System

The area of greatest difference, however, is the management and production system that is used by the Japanese transplants. They do not use the traditional U.S. methods with traditional labor relations. They use the Toyota Production System or some variation of it.

The key to the Japanese Production System (figure 2) is the integration of technology and human resources into a production system which continuously improves and the people continuously learn (Shimada and MacDuffie, 1986; MacDuffie, 1988; Krafic, 1988; Ettlle, 1988). With a few exceptions, this production system is completely transplanted from Japan to the U.S. The reason for the complete transplant is that the production system is an integrated package of factory practices, work systems and human resource policies. Adopting pieces of the system is difficult or of limited value.

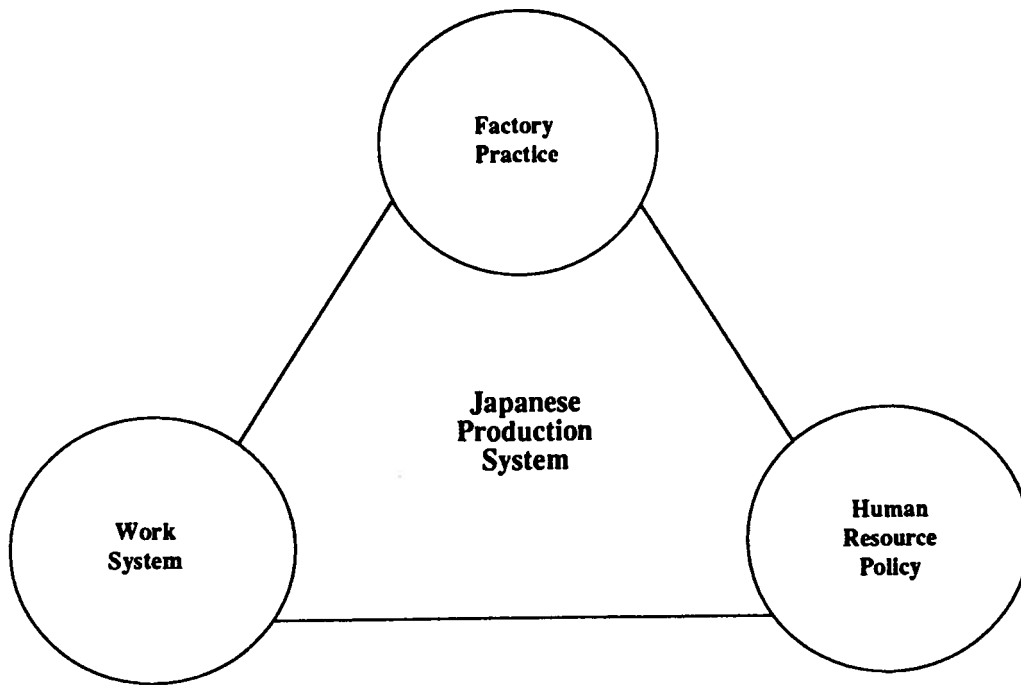


Figure 2

Factory Practice

Using the advantage of starting fresh, the Japanese have installed the factory practices that they use in Japan. These are listed in Table I.

Table I

Factory Practices

1. Just-in-Time (JIT)/Delivery of Parts (Frequent)
2. Zero Buffer Inventories
3. Small Lot Manufacturing
4. Quick Die Changes and Set-ups
5. Minimal Repair Areas
6. Contiguous Stamping, Painting and Assembly
7. No Inspections
8. Flexible, Manufacturing Methods

The factory is run on a JIT system whereby each operation provides its customers with just enough material to supply them until the next delivery arrives. These deliveries arrive frequently. Each operation responds to its customers' need. The system operates by pulling parts through it on an "as needed" basis. The system economizes on information (you need only know what your customer needs next) and minimizes inventories between operations.

The JIT system is very fragile or vulnerable to mistakes and problems. Herein lies the integration of factory practice and human resource policy. A single problem or quality defect can shut down the entire plant. Therefore, the plant must achieve total quality, must have suppliers who achieve total quality and must have the workforce motivated to work with the company. The human resource system must attract, train and motivate these workers or the production system will fail.

In order to have no buffer inventory, the factory must produce in small batches and frequently deliver them to subsequent operations. Machinery must be designed to change over quickly from one part to another and one model to another. People must make the change in dies and set-ups quickly and begin producing quality parts quickly. By placing factories close to markets, the plants must produce all models for that market. Flexible manufacturing methods, small lots and quick changeovers allow model variety to be produced and yet attain high unit volumes needed for scale and fixed investments.

No inspection and minimal repair areas save on labor costs and land size. But the lack of buffer inventory, inspection and repair areas motivate workers to be responsible for quality. The factory is dependent on them for quality the first time and the system obliges them to exert effort to provide that quality.

The last feature is the placing of the stamping activities next to the painting and assembly areas. This placement is needed for just-in-time arrivals but also for rapid feedback about defects. The earlier a defect is caught, the fewer pieces to be scrapped and the more rapidly a solution will be found. Collectively, these practices make up the technology of the Japanese Production System. It is extremely vulnerable to mistakes and problems. It is the design of the work system and human resource policies to minimize the chance of disruption. The risk of disruption is taken because the Production System minimizes the cost of inventories, labor, defects and space and creates superior quality. It also reduces the cycle time to deliver and produce for a customer order. It provides the Japanese auto companies with one of their major advantages.

Work Systems

The work system and administrative practices follow from the requirements of the factory practices. The work system attributes are listed in Table II below.

Table II

Work System

1. Work Teams and Team Leaders
2. Few Job Classifications
3. Job Rotation
4. Job Breadth

Quality Inspection in Jobs

Line Stoppage on Defect

Maintenance

5. Participation in Decisions

Job Methods

Quality Circles

Work teams and team leaders are transferred in total from the system in Japan. Teams of 6 to 8 people are the basic work group. They do not, however, function like self-managing teams in the U.S. or Scandinavia. The jobs are still individually defined along a moving assembly line. They do not assume responsibility for personnel matters. The team system is more of a philosophy of team work and cooperation.

The team concept applies less to the actual group structure and more to an attitude of working together. It emphasizes togetherness, helping each other and sharing information. In Japan, this group socializes after hours. This feature is not always followed in the U.S. plants. The concept of working together is extended to working with other groups, with engineering

(often in Quality Circle meetings) and with suppliers. The philosophy orients workers to broad plant goals rather than to narrow team interests.

Team leaders are key roles. They are selected by management rather than elected by the group. These are experienced workers who are paid at a higher rate. Their responsibilities are broader than the "utility" role in U.S. factories but less broad than the first line foreman or elected leader in a self-managing team. They are to know all jobs in the team and perform relief work for team members. But their critical role is teaching and training of other group members. They are also the liaison to other groups, like engineering and management. They are boundary spanners. They run the morning meeting to pass on information and conduct quality circles. They are key positions in the work system.

The transplants, whether union or not, utilize extreme reductions in job classifications. Usually there are three classifications vs. over a 100 for the traditional U.S. plant. One class is for all production workers and two for skilled technicians. Thus, the overwhelming majority of workers are in a single class which are called "associates" at Honda, "technicians" at Nissan and "team Members" at Toyota. There is a single wage scale linked to length of service. The single classification gives management much greater flexibility in allocating labor vs. the 100 class/100 wage structure of the traditional UAW plant. It also facilitates changes in production technology being accepted without upsetting the wage structure. It removes status differentials

attached to jobs and enhances the feeling of equality among employees, which is conducive to mutual help and team work.

The single classification, from the point of view of the worker, detaches wages from jobs and allows for paying the person. In Japan, the auto companies pay an individual a small bonus based on how well he performs and learns new tasks. This has not been transferred to the U.S. But the single class allows incentives to be oriented toward skill and knowledge learning which facilitates job rotation.

Job rotation and transfer of workers is done both for organizational adjustment and for personal development of the people. The cyclical demand for autos, the workload variations brought about by small lot production, variable model mix and rapid customer response times as well as absenteeism and training time all require shifting staffing patterns. Management needs the staffing flexibility to adapt to these business variances. It also needs flexibly trained people who can shift and learn new tasks rapidly.

Rotating workers is done quite systematically in Japan. Workers move within a group on a schedule and between groups whose cooperation is critical. So far the rotations in the U.S. have been due primarily to shifting workloads and less as a career path for workers.

The rotations occur after a person has been on the job six months. After that, they will rotate every few months. The rotations within teams, across teams, and across departments create

the career path for a worker. The path gives a continuing opportunity for skill development and for gaining a total plant perspective. Trips to Japan to learn new models, special task force assignments and promotion to team leader round out the career development path.

The reason that the time between rotations require several months is that jobs are much broader than on the traditional assembly line job. Workers do quality inspection, routine maintenance, make statistical process control charts and improve job methods. The workers also have the authority to stop the assembly line when a quality defect or other major issue arises. It is the self inspection and line stoppage that necessitates having the workforce with the company. There is considerable human control of the work.

There is also a good deal of participation in decision making. The workers improve on the design of jobs and offer suggestions for equipment modifications. This latter area is called "giving wisdom to the machine". The assumption is that each piece of equipment is unique. The way to utilize completely the capacity of a machine is to discover the machine's idiosyncracies and exploit them. Thus the effectiveness of a piece of production equipment depends on how its operator works with and improves it. This is a joint effort between workers, supervisors and engineers.

A high degree of control over the methods and procedures of jobs is given to the workers. Initially jobs are specified in great detail in the Japanese system. The specifications are placed

in standardized work sheets at each worker's station. These sheets are updated constantly by suggestions from workers. The engineers still need to approve changes and ensure consistency across shifts. In disputes, a conference of workers, supervisors and engineers across shifts is called. The influence of the workers is not complete but it is real. It contributes to the continuous improvement philosophy used in the plants.

In summary, the work system integrates with the factory practices. The reduced job classes, job rotation, teams, team leaders and human local control gives the flexibility that a just-in-time factory needs. The self inspection leads to early detection of defects and elimination of inspectors. Combined the factory and work designs lead to low cost and high quality products. But the system only works if the workforce is behind the company.

Human Resource Policies

The Japanese Production System was described above as being very fragile or vulnerable. It is very easy for a mistake, a quality defect or an act of sabotage to shut down the entire manufacturing process. Therefore it is absolutely essential that the workforce be trained, motivated and supportive of the company. It is the task of the human resource system to generate a workforce which is motivated, skilled, and adaptable.

The human resource policies are listed in Table III. These policies are like the factory practices and work systems that they

support. That is, they are an integrated set of policies which reinforce each other and the production system of which they are a part. They form a socio-technical system of a type which is different than the self-managing work teams of the U.S. and Scandinavia.

Table III

Human Resource Policy

1. Extensive Recruiting and Selection
2. Extensive Training and Continuous Learning
3. Compensation on Learning and Performance
4. Low Status Barriers
5. Pain Sharing
6. Job Security
7. Union Partnership

The biggest shock to observers is the scale and complexity of the recruiting and selection practices used by the transplants. They have been an enormous departure from U.S. practices and from practices used in Japan. In Japan, the companies hire directly from colleges and high schools with very little screening. The reason is that the school system does the screening and selecting. The Japanese companies have long standing relationships with the schools. They have no such relationships with U.S. schools. Also, the U.S. has a much more diverse workforce than the homogeneous Japanese one.

The selection process begins with the selection of plant location. The factories have been sighted in geographic locations which have more homogeneous and white populations. Usually, the locations are rural and the cultures support non-union attitudes. Many people are former, hard working farmers. Then the real selection process begins.

The first selection is an experienced competent American Human Resources manager and team. These people are usually from outside the auto industry. They are given considerable autonomy. They establish a selection process like the one used by U.S. companies employing high involvement work systems. (Since the 1960s Procter and Gamble has used high involvement in all of its plants. At Lima, Ohio, P and G selected 72 people from 1800 applicants. They were mostly former farmers).

The recruitment process is simply a matter of advertising. There has been an abundance of applicants. Toyota received 50,000 for 3,000 jobs. Mazda received 20,000. About 50% passed the first five step screening process. Mazda selected 1300 from the remaining 10,000. Each Japanese company has spent around \$40 million to staff their plants (about \$13,000 per selected employee).

The companies apply a number of criteria in selecting their workers. First, all the companies want young workers with no experience in the U.S. auto industry. They want to teach them the Japanese way and do not want to "unlearn" them of bad habits. They also want people with no union experience and preferably with anti-

union attitudes. Next, the companies want people who show "trainability" or adaptability. It is essential to have the ability and motivation to learn. The Japanese plants are based on flexibility, change, new methods, new technology, continuous improvement and job rotation. The selected applicants all demonstrate a potential to develop and learn. Usually, the plants require a high school diploma. Grades do not count. The Japanese see the diploma as a commitment to education and desire to finish. This feature qualifies them for the "life long learning" philosophies on which the plants are based.

The applicants are selected also on the basis of their enthusiasm and motivation. Their skill and physical dexterity is tested and observed. And finally, the Japanese want people with good interpersonal skills and an ability to get along with others. They seek an aptitude for teamwork. People who are team players and cooperative are selected. The individualists are not selected. Cooperation is key to teams and working with engineers. People who identify with the group and the company are sought. When starting with 10 people for every job, the desired people are not difficult to find.

The process at Toyota in Kentucky is typical. All applicants having a high school diploma go through 18 hours of testing. First they take two exams which test their general knowledge and attitudes towards work. These are administered by Kentucky State University. The top 30% of the people taking the exam go on to the next stage.

The second stage is the Interpersonal Skills Assessment Center. Groups of 12 are given problem solving exercises to handle while observed by Kentucky State University specialists. They are then given manufacturing exercises to assemble plastic toys. They are asked to follow a method but then improve on it and do it faster. Those who dislike repetition drop out voluntarily at this point. People who are not dexterous and fail to improve do not proceed to the next stage. About 10% survive and proceed to the last stage.

The top 10% received two rigorous and thorough individual examinations. The first is a very probing personal interview to test attitudes. It is also a "realistic job interview". That is, the job is described as clearly and as realistically as possible. The job is presented as changing jobs often, submitting suggestions, working in teams, uncovering problems, taking criticism and working hard. Workers are asked if they are willing to dedicate themselves to the team. They are also given a rigorous physical exam.

The selection process was similar but with a smaller applicant group at NUMMI. Toyota had to hire from the 6,000 laid off UAW members to staff the plant. Working with the UAW members they selected 2,500 from the 6,000. They selected a few at a time and then sent them to formal training programs.

A similar selection process takes place for managers. The Japanese place great emphasis on a candidates's understanding of and enthusiasm for the Japanese management systems. Especially

teamwork at all levels and in all departments is stressed. The managers are selected from among many applicants. Again people from outside the auto industry are sought and educated. Some managers many come from joint venture partners (both Japanese and American).

As suggested above, once selected, the workforce is first given formal then on-the-job training. People are not selected for specific job skills. They are selected for an aptitude to learn and then taught job skills.

At Mazda, everyone goes through 3 weeks of general training. They are taught how to improve their interpersonal skills and given practice sessions. They are taught how to brainstorm and suggest ideas. They see videos of people working and improving. They are taught the philosophy of quality and continuous improvement. They are taught how to chart quality with statistical process controls.

After the basic training, each worker receives 5 to 7 weeks of job specific training. On some key jobs and people, they are sent to Japan to work for 3 to 7 weeks in order to learn the "right" way. Then they spend 3 to 4 weeks being closely supervised on the line by engineers. Then the team leader takes over for continuous coaching and helping.

This level of selection and training is unheard of in traditional U.S. manufacturing firms. The process does select and train the people desired by the Japanese companies. It is regarded as excessive by many professional human resource people. But it does have the added effect of making the people feel special,

selected and elite. They come away from the process feeling motivated.

Training is an extensive and continuous process in Japanese companies. It starts as described above with general orientations of several weeks. Then there is job training, visits to "mother" plants, and then on-the-job training.

All of the Japanese companies send 10 to 15% of the workers and all managers to mother plants in Japan for observation, training and direct experience in the accepted practices. Growing companies, like Honda, use their existing U.S. plants as mother plants. Often some of the workers are transferred from the mother to the start-up plant.

Once a plant is started up, engineers and experienced, skilled workers from the mother plant are stationed on the shop floor. They continue the training and initiate the improvement process. Over time, the Japanese staff return to Japan and are replaced by Americans (except at Honda where a number remain).

The on-the-job training is taken seriously at Japanese plants. Traditionally at U.S. auto plants, a worker is given 15 minutes to one hour of instruction and then left to learn by doing by himself. At the transplants, engineers and skilled workers are actively involved in demonstrating, observing and coaching the new workers. Then the team leader takes over. Part of the reason for the extensive training is the breadth of the job. The worker is not to learn just his assembly job but maintenance, quality inspection, statistical recording and process improvement. The worker needs to

know when to call for help, when to stop or slow the line and how to work effectively with engineers. The engineers and workers from mother plants see that the start-up is launched correctly from the beginning.

The reward system is to produce a worker who is motivated to support the goals of the company. In Japan bonuses are used for this purpose. Workers receive 1/3 to 1/4 of their total pay through bonuses paid twice a year. These bonuses are determined by company profitability primarily but also have components for group and individual performance. In the U.S., the Japanese have not used bonuses as yet. They have one flat rate for production workers and one for maintenance specialists with some initial raises for performance. All companies have an initial pay rate. For effective performers, this rate is increased every six months. At Honda and Toyota, the worker reaches the top rate at 18 months. At Nissan, the top rate is reached in 3 years.

There is some question as to whether the Japanese will initiate a performance bonus system to maintain motivation after the top rate is achieved. It is a topic of debate. One side takes a position that there are numerous non-monetary motivators. The worker is initially selected and self-selected on the basis of liking the work and the company philosophy. The work environment per se is motivating. The worker feels special by being rigorously selected. Second, the opportunity to grow, learn new skills and participate in decisions is a primary motivator. Workers are appreciated and are able to use their brains as well as their

hands. The feeling of control of quality and the line gives responsibility and self-worth.

On the other hand, people say the feeling of being special and the initial pay increases will fade over time. The work will become a job. Workers have expectations of being treated poorly as in traditional auto assembly work. They are pleasantly surprised at the Japanese plants. This initial positive attitude may fade if not reinforced with other rewards.

Honda, who has been in the U.S. the longest, is experimenting with non-monetary rewards. They are using promotion as a reward. Because they are growing from a small motorcycle operation to two large auto assembly complexes, there are many opportunities. Workers have been promoted from assembly team member to team leader, to maintenance positions and for some into management. Most of the production department managers started as entry level assembly workers. The combination of learning, job rotations, and promotions provide considerable motivation for people selected on their interest and ability to learn and adopt.

Honda is also experimenting with non-monetary individual rewards. They are rewarding employees for suggestions with recognition awards such as trips to restaurants with the spouse. Mazda is considering a bonus system based on attendance and participation in various team activities. So there is some experimentation with rewards. The Japanese are moving slowly and cautiously in this area. On the other hand, they are still getting high levels of motivation from the workforce based on the selection

process, the egalitarian environment, the opportunities for learning and development and the participation in work place decisions.

The Japanese plants and their transplants maintain low status barriers between management and workers. The egalitarian attribute arose in Japanese organizations after the war. The Japanese are a very hierarchical culture but try to minimize visible status differences. This approach was adopted to minimize union threats and eliminate the adversarial relationship that was present in other capitalist countries (Kenney and Florida, 1988). The transplants all call workers by names such as associates. All employees including management wear white coats, eat in the company cafeteria and have similar privileges. Few job classifications also eliminate barriers. Another purpose of low status barriers is to encourage communication, particularly communication about problems.

Consistent with the low status barriers is the policy of "equality of sacrifice." In Japan when difficult times arrive, management cuts its salaries first and then asks for sacrifices from the workforce. In the U.S., the workforce always gets laid off first and perhaps management gets a lower bonus. The U.S. auto companies all negotiated concessions from the UAW (Iaccoca did forego a salary for a couple of years). But then General Motors announced big bonuses for its management. The sharing of the pain is seen as a real advantage in winning the support of the workforce.

The other policy that wins the support of the workers is job security. There is no guarantee of lifetime employment in the transplants. But all the companies have adopted policies that layoffs will be used only as a last resort. Management will reduce its salary first then voluntary layoffs will be sought. So far the Japanese have used slow times for training and maintenance and have had no layoffs. They have also had a period of growth and build-up. So the policy has not been tested as such. But with the flexibility to move work around, they will probably maintain their job security policy.

Most of the start ups are non-union. The companies, except Nissan, have adopted neutral attitudes towards the Unions. However, by their location, decisions and selections, they appear to prefer to avoid unions. Nissan has taken an anti-union stance and located in a conservative southern state. Both Nissan and Honda have received intense union organizing efforts from the UAW. In both cases the union lost votes to be the representative of the workforce.

The transplants that are joint ventures with the Big Three are unionized under the UAW. However, in each case, a new and different union contract has resulted (Rehder and Smith, 1986). The companies pay union wages but receive the single job classification. In return for few work rules, the Japanese have established the equality of sacrifice, job security and low status differentials as policy. They are able to use the team approach as

well which gives them the conditions they need to employ the Japanese Production System.

Toyota in particular has used the fresh start to their advantage in labor relations as well. It was not difficult to improve on the awful relations between GM and the UAW at NUMMI. But Toyota has worked hard to establish a climate of trust, support and fairness. The equality of sacrifice and job security policies help tremendously. Toyota has tried to establish the same relationship with the UAW that it has with its own company union in Japan. They use terms like "partnership" to describe the relationship. The labor agreement is 14 pages long and describes the common goals and philosophy to be followed. It is an agreement between the company and the union to share all the risks, responsibility and reward of partnership. The previous General Motors contract was more than 400 pages, was very complex and legalistic and very adversarial. From the beginning Toyota established an atmosphere of respect and harmony. To date, they have had only 3 written grievances.

In summary the human resource policies fit very well with the factory practices and work systems that make up the Japanese Production System. With a few exceptions this system has been transplanted from Japan. It is a superior system and a competitive advantage over the U.S. companies. The Big Three are stuck with existing plants, existing workers, existing adversarial union relationships and the worst of all, a traditional management. The Japanese have used the fresh start as an advantage against the

automotive leaders. It is only at some new Ford plants and General Motors Saturn project that the Big Three have been able to respond with a fresh start. At their other sites, they must convert from a traditional adversarial system to the superior JPS.

Superior System

The Japanese Production System has been shown to be a superior performing system to the traditional auto assembly system. From measures of productivity and quality coming from 52 auto assembly plants around the world, the MIT International Motor Vehicle Program has concluded that the closer that a plant approximates the Japanese Production System the higher is the quality and productivity coming from that plant (Krafcik, 1988; MacDuffie and Krafcik, 1989). The highest operating performances are obtained by those plants that have adopted the factory practices, work systems and human resource policies that were described above. This result is independent of the nationality of the management that is running the plant and the country in which the plant is located. That is, American plants run by American companies but using the Japanese Production System (JPS) are superior to some Japanese plants in Japan which do not use the JPS. Now most Japanese plants in Japan and in America use the JPS. These Japanese plants are superior overall. But it is instructive that it is the JPS that is superior whether it is run by Japanese or American management or whether it is in Japan with Japanese workers or in America with American workers. There is nothing which restricts it to Japanese culture.

Any country can adopt it as long as they follow it rather completely.

It appears that the JPS must be adopted in its entirety to achieve full benefit. The effect of human resource policies and quality of work life changes on economic performance at the plant level have produced mixed results (Katz, Kochan and Gobeille, 1983; Katz, Kochan and Weber, 1985; Katz, Kochan and Keefe, 1988). These studies took place in a single U.S. auto company over time (it is believed to be G.M.).

There is also growing evidence that investments in high technology processes without corresponding and appropriate changes in organization do not result in high quality, productivity or return on investment (Loveman, 1988; MacDuffie and Krafcik, 1989). General Motors has abandoned its "High Tech Leapfrog" of the Japanese. It is generally regarded as a failure (Keller, 1989). They have also learned from NUMMI where Toyota installed the JPS and a medium tech approach. Saturn is following this same medium technology approach. By itself, technology has not transformed the automotive workplace. Nor has quality of work life practices produced benefits when introduced individually. It is when all of the features of the JPS and technology are combined that quality and productivity increase.

The factory practices of just-in-time and zero inventories create a high degree of pressure to identify and resolve problems quickly. If not, the vulnerable production system stops altogether. The work system creates a skilled and flexible

workforce who can identify and act upon the problems. The human resource policy creates the skills, motivation and commitment among the workers to act on behalf of the company. The lower the inventory, the less the tolerance for error breakdown. The lower the inventory, the faster must be the response to errors, the greater the need for effort and teamwork, the greater the need for support and help from engineers and management. The JPS is an interdependent set of technical and organizational practices.

The JPS is also more effective at capitalizing on new technology and automation. Data show that increasing automation leads to increased productivity and quality when a plant has a low level of automation to start. But as Figure Three shows, increasing automation from medium levels to high levels in traditional plants does not result in increased productivity and quality. However increasing automation in the JPS does result in increased performance. It can capitalize quickly because the system facilitates learning and improvement (McDuffie and Krafcik, 1989).

The data reported above seems to confirm the socio-technical approach that was advocated by the Tavistock Institute in the 1960s. A more modern version of it is called "Synchronous Innovation" (Ettlie, 1988). That is, innovation and change using process technology (like robotics, CIM, and Group Technology) requires simultaneous and complimentary change in the organization in order to be effective. The more radical the technical change, the more radical must be the organizational change.

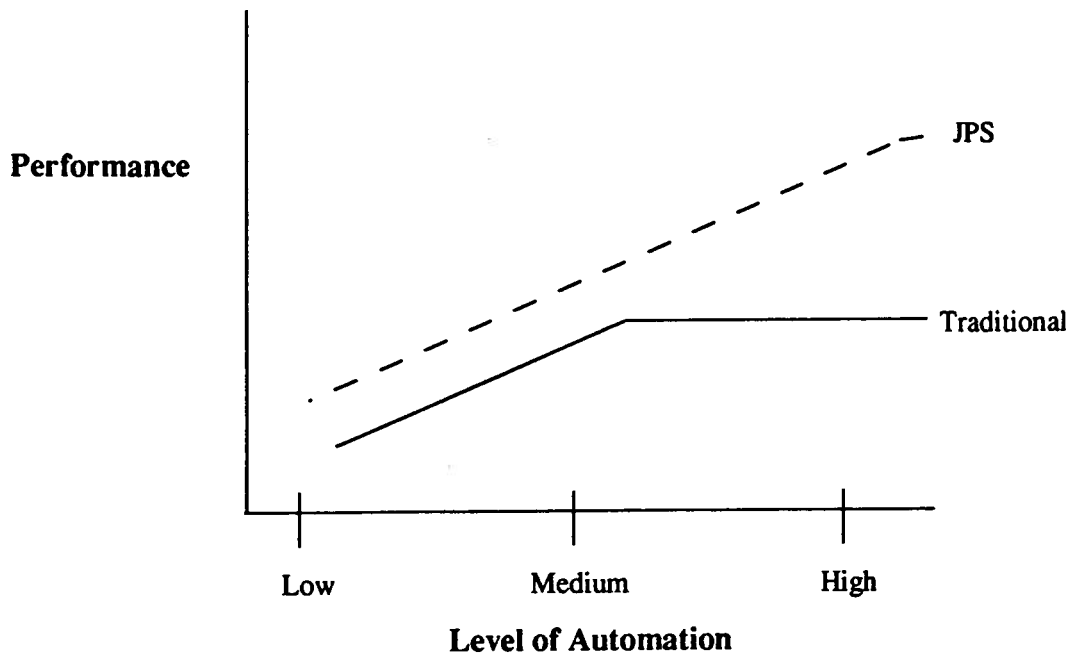


Figure 3

Ettlie's study shows that three types of integration and organization change are needed to support plant modernization. The first is to integrate across hierarchical levels. Usually this means distributing more influence to workers during the planning and implementation of new process technologies. Closer coupling of the top, middle and bottom of the hierarchy is required. Teams of workers, engineers and managers are the typical means for accomplishing the integration.

Second, closer coupling of the design and manufacturing are associated with more successful applications. Again it is the engineering and manufacturing team (including blue collar workers) that accomplishes the integration. These efforts are usually called simultaneous engineering or concurrent design. And finally

the same coupling of customers and suppliers are required. Sourcing arrangements with large suppliers and common means for establishing such relationships.

Continuous Improvement

It was mentioned above that the JPS was a problem raising system. It is a problem surfacing system because it is so vulnerable to mistakes, errors and defects that these must be quickly identified, fixed and their root causes eliminated. Indeed this problem surfacing and solving is one of the purposes of the JPS. It is to raise problems that are otherwise hidden in the traditional manufacturing system. It is this problem surfacing that drives the continuous improvement effort.

The traditional American assembly approach is to design enough insurance into the system so that the inevitable quality defects, machine breakdowns, worker discontents, and absenteeism do not effect the efficiency of the line. Jobs are narrowly defined, quickly learned, require little skill and workers are interchangeable. Workers are assumed to be unreliable so that they must be supervised, their quality defects sorted out by inspectors and repaired in the shop at the end of the line. Inventories (raw material, work in process of all types) are to provide continued supply when machines breakdown, suppliers are late, quality defects occur and so on. Automation is to reduce worker discretion and substitute for labor. Economies of scale are sought.

The JPS does not accept the inevitability of quality defects, machine breakdowns and late suppliers. It uses the vulnerability to find these problems, then fix them so that they are no longer problems. The process starts by decreasing inventories until a problem is discovered. The line stops if a machine breaks down. Rather than carry inventory as insurance against further breakdown, the machine is not only fixed but repaired and/or redesigned so that it does not happen again. The operator of the machine does routine preventive maintenance so that breakdowns are not likely. He observes the machine closely and calls in maintenance before a breakdown occurs. Maintenance and engineering repair it during a downtime and design a more permanent fix.

The inventory is dropped again until a quality problem is surfaced. A team of workers, management, maintenance personnel, engineers and vendor representatives (if needed) diagnose the reason for the problem. A new material is used, a machine is repaired, the process is redesigned or a worker method error is corrected. The self inspection by each operator surfaces a defect before it goes very far from the operation which caused it. The problem is easier to detect and diagnose. Very few defective parts are produced and scrapped before the detection stops the line. The operator finding a defect is congratulated for finding it. In traditional organizations, finding and reporting problems is taboo. It is fundamental to the effective operation of the JPS.

The line starts again and the inventories are decreased until a machine is discovered which cannot change over quickly enough to

supply its next operation. Another problem solving team tackles the problem to find a way to reduce the set-up time. Then the process begins again until a vendor is discovered who cannot supply on a JIT basis. People are dispatched to aid the vendor. When the vendor adjusts or a new one is chosen, the process begins again.

In this way problems are continually surfaced as the inventory drops to zero or an irreducible minimum. Along the way poor methods of some jobs are discovered and changed, weak suppliers strengthened, machine capacities are balanced, machine design flaws are discovered and eliminated, product designs are improved, quality defects removed, etc. Rather than accepting these problems as inevitable and "natural" and insuring against them with buffer inventories, the JPS surfaces them and solves them on a continuous basis.

The worker on the line is the key surfacer and an active solver of these problems. If the worker is not motivated nor skilled enough to notice a problem, the system breaks down. If the worker is not interpersonally skilled at teamwork to work with engineers the system is less effective. The JPS could not operate under the traditional U.S. auto company human resource and industrial policies. The JPS requires a motivated, skilled and adaptive workforce to work at all.

The process continues until the inventory is driven to zero and the JPS drives problems out of the manufacturing process. In order to get inventories to zero, the plant must have near perfect quality, employee involvement, trained and flexible workers,

teamwork, low change over times, good relations with suppliers and a philosophy of continuous improvement. If the plant does not, the line stops or slows until the plant solves the barrier to zero inventory. Along the way, the pressure of the process forces engineers to adjust and redesign the manufacturing process and the product design. The Engineers must adopt product family plant layouts, group technology policy, flexible manufacturing techniques and design for manufacturing practices. It forces the product engineers to know the manufacturing process and work with manufacturing engineers. Management does not have to push group technology or any other design policy onto the engineers. The existence of real problems pulls them in that direction for solutions.

Next the statistical process control (SPC's) charts are used. When an "out of control" observations occurs, the line stops or slows and a team gathers to diagnose the cause of the variance. At this point process control variances surface problems to be solved. Each discovery of a variance triggers problem solving activity which leads to continuous improvement of the manufacturing process and product quality. When no out of control variances occur, the tolerances are narrowed and the process begins again. The narrower the tolerances the better the quality.

In this manner lowering the inventory, narrowing the tolerances and reducing the cycle time drive the organization to continuously improve. The surfacing of problems on the line pulls the organization into action. In order to solve the surfaced

problem the plant must have a skilled, motivated workforce, teamwork across all units and a responsive, supportive management. Management must see that the system works. Along the way they coach or train a worker, solve an interpersonal problem, talk to a vendor, work for cooperation between product and process engineers, prioritize suggestions leading to capital investments and so on. It is nothing less than a shift from control and pushing policies to supporting and coaching workers and engineers who are pulled along by the problem-solving process. The JPS manages the workforce and the engineers. Continuous improvement and JPS is really a philosophy for running the plant.

In summary continuous improvement is driven by the JPS itself. The lowering of inventories and narrowing of tolerances generate problems for the organization to solve. In solving the problems the organization learns and improves its performance. The result is a production system that generates higher quality, lower cost, more flexibility and more responsiveness to customers than the traditional mass production system.

Managers in the Transplants

The Japanese appear to have won the hearts and minds of the blue collar worker in the transplants. They have created high performing factors that resist union organizing attempts. Thus far, they have not been effective at winning the managers over to their system. They appear to be having trouble attracting and holding talented management personnel. As the Japanese transfer

more value added to other countries, the question arises as to whether management and engineers will fit into their transplanted systems.

Up until now the Japanese have used assembly plants and design and styling studios and R&D labs as their foreign value added. In the auto industry Honda, Toyota and Nissan all had design studios in California (Los Angeles) before they had assembly factories. Initial clay models from stylists in California were sent back to Japan where Japanese engineers and manufacturing specialists did the simultaneous engineering. The cars were manufactured in Japan first and then the plant was virtually transplanted to the U.S. Until recently the cars were still engineered in Japan, introduced to Japanese factories and then transferred to the U.S. plants. Many engineers at U.S. plants were Japanese.

Now Nissan will be the first to design, engineer and manufacture an entire car in the U.S. The project will be a mini-van designed in its San Diego studio, engineered at Nissan Research and Development in Detroit and manufactured in a joint venture with Ford in Ohio. Honda has located 250 engineers in Marysville, Ohio to design its Accord station wagon. It will use simultaneous engineering on the project. The design facility is adjacent to the factory in Marysville. In both cases engineers and managers from Japan will play key roles in managing and teaching the process. Toyota has had a design studio in California for 17 years. It is just now using it to design the whole car rather than features. The engineering however is still done in Toyota City. But in

general, all auto manufacturers are moving design and engineering work to the U.S. Their subsidiaries are becoming complete companies. They will not be autonomous but will adapt models to the American market. Engines, transmissions and key components still come from Japan. Honda is the most complete. It now qualifies as an American car with 75% of the value added coming from America.

The additional value added will mean more engineering, manufacturing and management jobs will move to the U.S. The ability of the Japanese companies to manage the value added in other countries will be a severe test for their management system.

The studies of Japanese companies overseas show that the Japanese companies are experiencing difficulty with managers and professionals coming from other countries (Sethi, Namiki, and Swanson, 1984; Negandhi, Eshghi and Yuen, 1985; Bartlett and Yoshihara, 1988). The initial studies of Japanese management outside of Japan focused on plants in the developing countries of Southeast Asia. Here the Japanese did not transplant their system of management. They used whatever low cost local system was in place. In Taiwan (Negandhi, 1973), Singapore and Malaysia (Sim, 1977), the Japanese companies did not use the Japanese decision making process except among the Japanese expatriates. The subsidiaries were subject to tight control and centralized decision making among the Japanese on site or in Tokyo.

In the developed countries, the Japanese transplant their complete production system and industrial relations policies.

However, they have not transplanted their management systems of consensus decision making. (Negandhi, Eshghi, and Yuen, 1985). Even in developed countries the decisions are made by Japanese expatriates in the subsidiary or at headquarters in Tokyo (Havatny and Pucik, 1981). The Japanese expatriates show a low level of confidence and trust in local managers (Kabayashi, 1985). As a result, there exists an unofficial ceiling on promotion of local nationals.

The Japanese appear to be ill-equipped to decentralize decisions to foreign nationals running their local subsidiaries. They are more ethnocentric than most countries due to years of geographic and political isolation. When they finally focused on international business they expanded by exports and manufactured at home. With lifetime employment policies, they had difficulty investing overseas. The bias was to invest and grow in Japan. In addition, the Ministry of Finance had to approve all foreign investments. Their priority was for foreign upstream natural resource projects.

The business climate actually favored their export strategy. The 1960s and 1970s were decades of the Common Market, GATT and relatively free trade. The deregulation of markets, technology and rising R&D costs all favored global scale economies. Japanese companies pursued global strategies, universal products and world scale factories all managed with central control coming from headquarters in Japan. This centralized headquarters dominated policy persists in almost all Japanese companies today. It is

reinforced by the accumulation of assets and skills in the home country. It is defended by the vested interests whose organizational power bases rest on their control of overseas subsidiaries.

The Japanese management system is also a powerful force resisting decentralization. The decision processes are heavily dependent on participants having shared values and engaging in intense face to face discussions. In addition to an ability to speak Japanese, the participant must have a thorough understanding of the cultural decision process as an internal network of contacts. For managers in subsidiaries, this barrier is simply too great. They are relegated to national careers and low levels of influence even in decisions in that subsidiary.

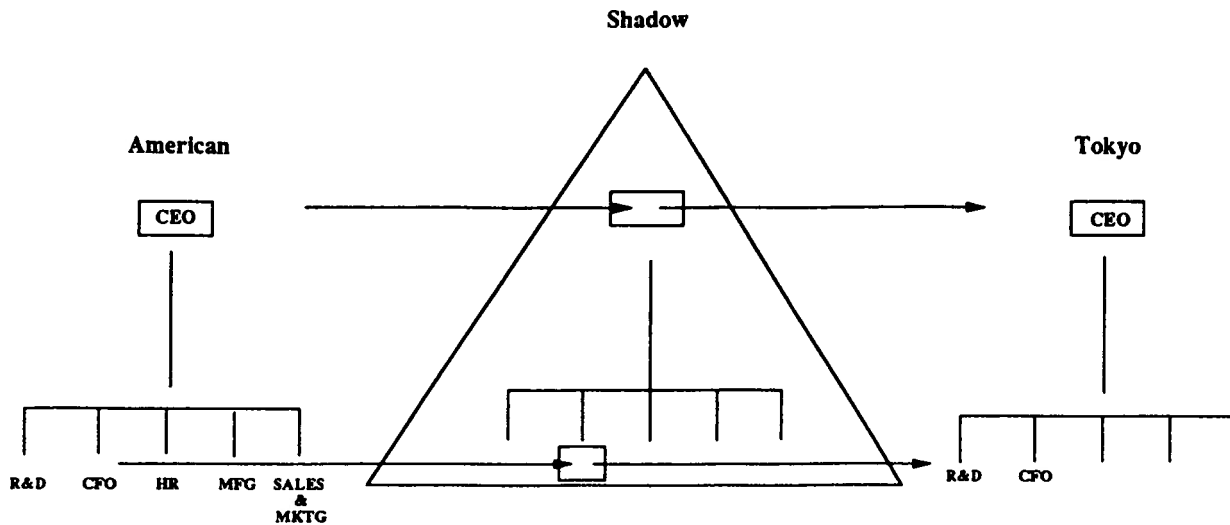
The Japanese are able to manage their foreign subsidiaries by sending Japanese to the subs and by enormous travel budgets. The Japanese multi-national companies have ten times as many expatriates in their subsidiaries when compared to American companies (Bartlett and Yoshihara, 1988). To some degree, all nations have problems with international subsidiaries and rely on expatriates from the home country (Edstrom and Galbraith, 1977) until local nationals are developed and learn the company's systems. But the Japanese are slow to turn over influence to locals. When the top positions in the subsidiary are turned over to locals they must communicate through coordinators resident in the subsidiary when talking to Tokyo. Even a company like Matsushita has over 800 Japanese in foreign subsidiaries. At 3M,

which has an identical foreign size, there are less than one hundred.

The auto companies all use the shadow organization (figure 4). The shadow organization was briefly described earlier. For each major position in the hierarchy, there is a duplicate "coordinator" position filled by a Japanese expatriate. The sales and personnel are sometimes more local and exempt from the coordinator observation. But the coordinator hierarchy, which is physically in the subsidiary country, participate in the consensus decision process of the headquarters. Therefore they insist that all communication between the headquarters and subsidiary "go through" them. The assumption is that the language and culture gap is so great that interpreters are needed on site. In addition the occupants of the shadow positions are being trained as possible replacements for the locals. At Mazda the top two American managers have resigned twice in the last two years. The shadow organization Japanese have taken over as a result.

Some of the problem rests with the Americans. Few of them learn to speak Japanese. But even if they did learn the language, they feel that they would not participate in significant decisions. As a result, the Japanese are having difficulty attracting and holding good people in management and engineering positions (Pucik and Hanada, 1989). The difficulty only reinforces Japanese lack of trust and confidence in foreigners. They only see mediocre subordinates. The good ones see limited opportunity, use the Japanese to get experience and leave for better positions in other

companies. The Japanese do not want to invest in training and development for people who will leave for the competition.



Shadow Organization

Figure 4

The Japanese should not be underestimated. They are having trouble like every other multi-national including non-nationals in strategic decisions. They happen to have a more severe version of the problem. But they had problems before and continually learn and work to solve them. They are more successful at preparing their expatriates than American firms (Murray and Murray, 1986). They invest heavily in training and language for foreign assignments. Currently they are hiring college graduates from the U.S., teaching them Japanese language (if the graduate has not already learned it) and sending them to Japan for 2 to 3 years in headquarters. In Japan they will learn the culture, the decision

process and the network of contacts. The company will still have to hold on to these people when they return to the subsidiaries however.

The Japanese are adjusting to the new global realities. They are traveling, learning languages, opening up their organizations somewhat to foreigners and so on. But they are also becoming more arrogant. As Japanese business dominates the world, the young Japanese are learning a feeling of superiority (which reinforces cultural superiority feelings long held by the Japanese). When they visit subsidiaries staffed with mediocre locals, the arrogance is reinforced. So they easily state the belief in multi-nationals that the job should go to the best qualified person anywhere in the world. But of course, the best qualified is always a Japanese.

In summary, the Japanese transplants are not attracting and holding competent local managers and professionals. These people see themselves excluded from significant decisions about their work. While the Japanese are adapting, they have a long way to go. In addition there are not enough Japanese to staff the worldwide operations of the multi-nationals. They are already experiencing shortages of skilled people, they still exclude women and they are experiencing reluctance on the part of managers to go abroad. The good managers want their children in the right schools in Japan not in American schools or a transplant school from Japan.

The inability to attract enough talent to foreign subsidiaries will be a major weakness for Japanese firms and major windows of opportunity for Western firms. The rules of global competition are

changing so as to encourage the distribution of management work around the world and out of the headquarters in the country of ownership. All companies are having difficulty with this trend. But the Western companies have had more experience, are less ethnocentric and can manage decentralized operations. They have an advantage over the Japanese for the time being.

Summary

The Japanese are investing in the U.S. and Europe. They are transferring more and more value added manufacturing to the developed countries. In situations where the Japanese Production System will give them an advantage over the established leaders, they will transplant the JPS in its entirety. They will use a fresh start to create the conditions necessary for the JPS to work. They will negotiate a new union contract if they cannot avoid the union.

Those transplants have been successful. They achieve higher productivity and quality than existing manufacturing methods. However, it is the JPS itself that is superior. When the JPS is adopted by Ford or U.S. electronics companies like H-P it is just as successful. The U.S. companies are busy trying to redesign their plants in order to compete. However, redesign is much more difficult than the fresh start.

The Western companies are all playing catch-up with the Japanese. We are now copying them. Of course, they like this situation. They can focus on new sources of competitive advantage

while we learn their JPS. They are happy to teach it to us. We are busy copying what they already know. We also have to focus on new rules of competition that disadvantage them. Perhaps the difficulty of attracting managerial talent will be the opportunity on which we should focus.

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