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**The New Plant:
A Second Generation Approach**

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The creation of a new manufacturing location represents an excellent opportunity to install a new management approach. In a new setting, all the systems in an organization can be designed from the beginning to be consistent with a particular management approach. As a result, whole new approaches to organizing and managing work can be put into place virtually overnight. In 1978 I wrote an article, "The New Plant Revolution", which described a new approach to management that was being used by a number of companies when they created new plants. This New Plant Approach is much more participative in its management practices than traditional management approaches and incorporates a number of innovations.

Recently, I wrote an article which reviewed the New Plant Approach. It argues that the approach has been very successful, and that not only have companies such as Procter and Gamble and Mead used it for all their new plants, some companies have successfully converted their old plants to it. In addition, many of the specific practices which are part of it have spread to existing plants and have become standard operating procedure in a large number of manufacturing settings.

Even though the New Plant Approach has proven to be quite successful, there are opportunities to improve upon it. It was developed over 20 years ago and a great deal has changed in the last 20 years. Significant new management technologies have developed, particularly in areas concerned with the management of quality and the utilization of information technology. In addition the business environment has changed in many respects. Many markets have become global and as a result performance standards with respect to quality, speed and costs have moved substantially higher.

In this paper my focus will be on developing a new or next generation management model for settings that are to be managed with a participative management approach. Although I am building on work that was originally done in manufacturing settings, much of what I have to say applies to any organizational setting where a product or service is being produced or delivered.

The major feature which differentiates the Second Generation Approach from the New Plant Approach is the degree to which it places information, power, knowledge and rewards in the hands of the individuals who are actually producing the products and services. The intention is to develop a high level of business involvement among all employees. The expectation is that doing this will lead to performance improvements in

speed, quality and costs because lower level employees will be able to act more quickly and in a better informed and more motivated manner.

The New Plant Approach for a variety of reasons, focused heavily on being sure that individuals had control over and information about their piece of the production process. It might best be called a productivity involvement or plant operations involvement approach to management. Getting individuals involved in the business of the organization represents a significant step beyond this type of involvement.

Getting individuals involved in the business requires the adoption of the same practices, (e.g., work teams, all salary workforce, and skill-based pay) that are part of the New Plant Approach, but it requires going beyond them in a number of areas as well. It requires that individuals receive new information, have additional skills, be rewarded differently, and ultimately have the power to influence many parts of the business process. With this in mind, let us turn to a consideration of the features that need to be built into an organization if it is to involve individuals in the business.

Organization Design

The New Plant Approach includes a flat organization design and the extensive use of self managing teams. This basic design approach is appropriate for a business involvement plant design as well. It is particularly important for business involvement that teams have the responsibility for producing a whole product or completely serving an identifiable customer base. This is critical, because without it, it is impossible for individuals to feel that they have a business that they control in a bottom line sense and that they have an external customer to satisfy. In a manufacturing setting a team needs to be given responsibility for producing an entire product and needs to be given responsibility for dealing as directly as possible with both customers and suppliers. This is necessary to complete the business cycle and to produce business involvement. They, in essence, need to be responsible for all the value-added activities that occur with respect to a particular product.

In the case of service teams the same principle holds. Employee teams need to be given responsibility for performing all activities with respect to a particular customer. This principle means, for example, that work teams which are processing and managing mortgages for an individual, or handling their credit card business need to be given responsibility for the entire service process with respect to the particular customer.

In creating teams, a clear bias needs to exist toward establishing external customer-supplier relationship for each work team. These can be internal customer-supplier

relationships where possible there is a definite advantage to having these be external customer-supplier relationships. This provides the most "real" business experience for individuals and keeps them in contact with the competitive business environment that they are in and the kind of demands that the organization faces from its external markets and suppliers.

In order to facilitate teams managing a business it often is important to include some of the staff support members in the production teams. For example, engineers and accountants may need to be placed on the teams so that the teams can handle a full scope of business issues and in effect operate as a mini business enterprise.

The physical layout of the facility needs to be designed to facilitate teams owning an entire product or customer. Equipment needs to be positioned so that employees who are on the same teams are located together. Staff support individuals need to be located in the production areas they support. Walls and other blocks to communication need to be minimized or eliminated as do all symbols that indicate differences in power and status. Hierarchical symbols work against all individuals feeling responsible for organizational success and they encourage decision making based on hierarchy rather than on expertise.

The sociotech approach to work design and the total quality management approach both argue for building teams around key work flow interdependencies. Total quality programs also stress the importance of establishing clear customer relationship. Thus both the total quality and sociotech approaches are compatible with creating business involvement plants. The sociotech approach has in fact frequently been used in the design of new plants. However, neither the sociotech approach nor the quality approach necessarily creates teams that are responsible for whole products or services nor do they always create teams that have external customers. Both of these are critical elements in establishing the kind of teams that encourage business involvement.

There are some interesting examples of organizations giving teams responsibility for taking a product from suppliers to completion. For example, the Digital plant at Enfield, Connecticut allows work team members to deal directly with suppliers and gives them direct contact with the customers for the electronic boards that the teams make. This contact is facilitated by giving the team members business cards and putting an 800 phone number on the product so that the customers can call them directly if they have a question or problem with the product that the team has produced. The teams are also encouraged to visit customers and to invite their suppliers into the plant to work with them in assuring high quality supplies.

The new Swedish car manufacturing facility of Volvo carries the team model further than any other manufacturing facility of which I am aware. The customers, through information technology, place an order directly with the manufacturing team. The team informs the customer of the build schedule for the car and invites the customer to be on hand when the car is built. Once the car is built, the team delivers the car to the customer and is given data that allows the team to maintain an ongoing performance record for the car. They can also communicate with the customer through information technology that ties them to the dealership and to the customer. This model has the potential to tie a team, which builds an entire car, to a customer over a sustained period of time. It allows them to get ongoing feedback about the quality of the cars they produce and to respond to customer questions and issues.

Total Team Environment

The New Plant Approach stresses the use of teams at the production level, but does not stress the use of teams in other parts of the plant. The jobs of managers, office personnel and staff support individuals end up being different than they are in a traditional plant because they have to deal with teams, but they are not in a team structure. This inconsistency has created some problems and in some respects has limited the effectiveness of the New Plant Approach because staff support groups do not have the same kind of flexibility and performance gains that are characteristic of the production area.

The obvious solution to the problem of differences existing between the production area and the rest of the plant is to make the plant a total team environment. Several organizations have done this by placing as many support people as possible in production teams and by creating management teams and staff support teams. These teams meet regularly to allocate their time and effort and, like production teams, do a considerable amount of self managing. They usually are not as flexible as the production teams, since it is harder for individuals to learn other jobs in many staff and managerial roles. Nevertheless with some cross training they still are in a good position to take advantage of some of the flexibility that is inherent in the team concept and to do a substantial amount of self-management.

The use of team structures throughout the organization should contribute to an even flatter structure than is characteristic of the New Plant Approach. The hierarchy in plants using a team approach is usually quite flat with wide spans of control, but there is always a limit to just how flat it can be because of the need to have a supervisor for at least every

three or four work teams. This can be partially overcome by having a team supervision approach so that individuals in managerial jobs can help each other out and cover the demand irregularities that are inherent in supervising a number of teams.

Business Integration

The New Plant Approach typically has been applied to locations that do only manufacturing. This has meant that employees in the manufacturing area have little input or contact with individuals who are doing product development and little contact with individuals doing sales, customer service and customer relations. This is an obvious lack with respect to business involvement because it means that in most situations individuals are not involved in the total value creation process of the organization and do not have external customer contacts. It can be corrected, however, by co-locating and better integrating other functions with the manufacturing process. The use of concurrent engineering by an increasing number of organizations represents just such a positive step.

Product development can be co-located at manufacturing sites, so that individuals in the manufacturing areas can be involved in issues of product design and product development. Production employees may not have great amounts of customer knowledge, but they do have a great deal of knowledge about manufacturability and it is important to capture this expertise in the product development process. Similarly, if the marketing and sales organizations are co-located with manufacturing, it can provide individuals in the manufacturing area with an opportunity to deal with customers more directly and to have inputs to the marketing and sales process.

The co-location of product development, manufacturing and marketing/sales is not necessary in order to have for individuals involved in all phases of the business process. Task forces represent one way to create involvement up and down the value-added chain without co-location. Information technology can also be used to allow individuals in the manufacturing area to have input to product design as well as sales and marketing activities. With networked computers they can be given the opportunity to comment on new product designs and, in some cases, to answer marketing and sales questions about the products and services that they produce.

Reward System

Two important and visible features of the New Plant Approach are the extensive use of skill-based pay and the commitment to job security. In the Second Generation Approach there is no reason to change either of these since both are consistent with a business involvement approach that pushes information, power, knowledge and rewards downward. Indeed, what is needed is an extension of the commitment to skill-based pay. In the New Plant approach, it is applied only to individuals who are in self-managing work teams, which in effect, means it applies only to production area employees. With the use of teams throughout the organization, it is appropriate to extend skill-based pay to all employees in the organization. This means that staff, managerial and clerical teams would have skill-based pay just as do production teams. Few organizations have done this so far although Polaroid stands out as a notable exception. The advantages of applying skill-based pay to all employees are essentially the same as those that are derived from doing it with manufacturing employees. It has the potential to create a more flexible and knowledgeable work force, and it is highly congruent with a team-based management approach that stresses learning and continuous improvement.

Completely missing in the New Plant Approach are reward systems that are based upon organization and business performance. This is an enormous void, and one that needs to be filled in a Second Generation Approach which is based on business involvement. Individuals need to be accountable for the results of the business, and the best way to do this is to make their pay at least partially dependent upon the success of the business for which they are responsible. This can be done through gainsharing plans, profit sharing plans and employee ownership. The approach which makes the most sense is determined by specific organizational conditions, Critical factors are just how much of the business process an individual plant or location can be held accountable for and how it relates to the rest of the organization. In many cases, more than one pay for performance approach is likely to be appropriate. The key is to make an important part of compensation variable based on the controllable performance of the unit that is being focused upon. In the case of the new startup, it may not be appropriate to put a gainsharing or other plant level plan in at the beginning. It is often difficult to design a good gainsharing plan in the beginning because it is hard to know what to measure and even harder to know what the standard is above which a bonus should be paid. What can be done at startup is to make a commitment to the development of a gainsharing or profit sharing plan, and to begin the development process within several years after the startup of the new location.

The final important feature of the reward system in the New Plant Approach is team based pay increase decision making. There is no reason to change this. In fact with the greater use of teams in the Second Generation Approach, it is important to extend it to white collar and managerial teams. In some respects it can be harder to do skill based pay in non-production areas because the quantification of performance and skill acquisition is more difficult. Nevertheless, this important feature needs to be built into these work teams as well. Without it, teams cannot control an important feature of their environment that influences performance.

Information Technology

When the New Plant Approach was developed, there was very little use of computers and no use of computer networking by organizations. This limited the kinds of decisions that work team members could be involved in because it made it difficult to deliver many kinds of information to them in a timely fashion. With the advent of cheap computing and sophisticated information system networks the situation has changed dramatically. It is now possible for all employees to have access to PCs or terminals that are linked to corporate-wide information systems. This means that employees can get a great deal of information about the business, their local operations and, indeed, operations in other plants. This in turn means that they can be involved in a wide range of decisions and get feedback in areas where it was not practical before.

The Second Generation Approach needs to take advantage of information technology so that individuals have the ability to access a great deal of data about what is occurring in other areas of the company, how their product or service is performing, how it is seen by customers and how much it is costing to produce. This can increase tremendously the amount of feedback employees get, as well as change their decision making process so that they can consider more than just quality and production numbers. It can allow them to understand the economic tradeoffs that are involved in their performance and thus enable business involvement.

If arranged correctly, information technology can also help with problem solving and education. For example, it can allow employees to communicate with each other when they have a technical problem and avoid the entire process of going up and down the hierarchy to find out who has a particular expertise and what the correct solution is for a

problem. In some Procter and Gamble plants, for example, if individuals or teams have a production problem they can simply put the information on an electronic bulletin board and ask for help from anyone throughout the organization. This may result in someone in another plant who operates a similar piece of equipment or has relevant expertise for another reason, getting in contact with the individual or team and providing problem solving help. It also is possible for employees to compare production rates and numbers from plant to plant so that they are aware of just what can be done with the equipment for which they are responsible.

Networked computers can also be used to expand the input opportunities of employees. In the New Plant Approach attitude surveys and focus groups are often used to sense how the employees are feeling about their job situation, but this is inherently a slow and limited approach to gathering data. Some organizations are now converting this to a information technology-based system in which survey questions are simply put on the network and individuals are allowed to respond to them in an online fashion. In addition, key strategy or policy decisions can be put on the information system for comment and debate. This can mean that employees in locations all over the world have a chance to give inputs on new policies and practices that previously would have been decided by a corporate staff group and senior management.

Finally, television can be used to help link employees who are involved in different aspects of the production or service process. This can take the form of video tapes which show employees in the manufacturing environment what employees outside that area are doing, or as has been done in some plants, individuals earlier in the production process can be linked to those later in the production process by closed-circuit video. This has the obvious advantage of improving communication and understanding throughout the production process. It also can help individuals conceptualize what is going on elsewhere in the production process so that they can identify with the total product that is being produced and suggest improvements.

Television and electronic mail can also be used to support business involvement by reporting on financial results and key company events. In some companies this is already being done on a wide basis. In one company a quarterly state of the business video tape is sent to every employee's home. Other companies do television broadcasts on a weekly basis in order to keep employees up to date on what is happening.

Quality Technology

When the New Plant Approach was first implemented in the late 1960s, very little was known in the United States about the type of quality programs that were being developed in Japan. The situation has changed dramatically since then. Virtually every major corporation has a total quality management system that is based on the work of Juran, Deming or Crosby. These so-called quality gurus have strongly impacted the way quality management is conceived of in the United States. They stress the importance of employee involvement in producing high quality products and offer a number of specific management tools to improve quality. In many respects their concept of involvement is much more limited than the one which is present in the New Plant approach, but this does not mean that the quality tools that they have to offer are inappropriate. Indeed, many of the tools need to be adopted because they can help work teams and plants do a better job of managing themselves and understanding their production processes.

Statistical process control, cost of quality measurement, and some of the problem solving approaches which are inherent in the quality technology fit well with the Second Generation Approach. When these are installed in a business involvement oriented plant they can substantially improve the ability of teams to understand their production process and become more self-managing. Also, potentially useful are quality improvement teams and task forces which are targeted at improving particular features of the production or service process. In comparison to traditionally managed locations, however, many fewer of these teams should be needed in those organizations that adopt the Second Generation Approach. The reason for this is simple. The work teams should handle much of the improvement process activities themselves without the need for special groups and the extra cost that are involved in creating them and supporting them. However, there may be some organization-wide issues or some in-depth sticky problems that effect several teams that need individuals dedicated to them for a substantial period of time. In these cases the use of problem solving teams makes sense.

Overall, the correct stance with respect to quality technology is to adopt those pieces of it which improve the problem solving process, bring more information and knowledge into work teams and allow them to be more self-managing. Several plants, which started in the 1970s with the New Plant Approach have done a good job of just this. They have trained their employees in statistical process control, problem analysis and in process

continuous improvement because the simple fact of the matter is that performance standards, with respect to most products and services, are constantly going up world-wide.

Continuous improvement can be done within work teams if they are given the appropriate information and support, but it also may require separate structures in order to get the appropriate amount of attention and an organization wide perspective. This suggests that organizations regularly need to create task forces or design teams that assess the organization and look at its competitive position. They need to use such things as attitude surveys and competitive benchmarking to see how well the organization is operating and then to involve people within the organization in the improvement process.

It is hard to say exactly how often an extensive organizational renewal or assessment process should be undertaken, but a rough guesstimate is that it should be done at least every two years with benchmarking being done at least annually. One feature that can help this go better is to invite customers and suppliers to be involved in the assessment process. Similarly, outside experts in critical areas can be brought in to help describe the newest management technologies as well as the newest manufacturing technologies, the key is to help the organization update itself and assure that it stays on the cutting edge.

The Second Generation New Plant In Practice

When I wrote my first article about the New Plant Approach, I was able to report that a number of plants already existed which followed this model. The same is not true with respect to the Second Generation Model. I know of no example which perfectly fits it, however, a number of organizations are clearly moving toward having plants which fit it. Organizations like Mead, TRW and Digital have plants now which have many of the features of it already in place. Thus, my prediction is that before too long there will be a number of good examples. Because the Second Generation Approach clearly represents a significant step beyond the New Plant Approach adopting it involves some risk. However, with the growing emphasis and acceptance of employee involvement as a management strategy, it has a high probability of being tried. If, as seems likely, it can offer efficiencies in the areas of reduced overhead, greater commitment to the business and overall, greater flexibility and responsiveness then its use may grow rapidly.

management. This has helped them improve their organizational performance and advance further in the area of business involvement and self management.

Human Resource Management

A heavy commitment to selection and training is a critical part of the New Plant Approach. This typically includes realistic job previews as well as team based selection processes. If anything the Second Generation Approach requires a greater commitment to selection and development. In the area of development, for example, it requires a commitment to individuals learning a great deal about quality technology. It also requires individuals to learn more and more about the business impact of their roles in the organization. This means they need to get extensive economic education as well as being educated in the technical details of the manufacturing or service process.

In essence, individuals in the production area need to be treated more and more like managers as far as the kind of training, information and pay rates they receive. In the terms of skill-based pay, individuals need to be able to progress higher in total compensation in return for learning vertical or upward skills. This has implications for the kind of individuals that are selected since much more is expected of them than just the ability to work in a team and control a production process, they need to develop an understanding of the business.

The Second Generation Approach demands a great deal of managers, they must be coaches, leaders, and expert resources. Getting the right kind of manager cannot be left to chance. The selection process needs to be able to identify them and of course, training and support needs to be available to them. In the area of selection, assessment centers and simulations can help to identify the right individuals. The training and development process needs to include peer and subordinate assessment data and behavioral learning experiences.

Renewal/Improvement Process

The New Plant Approach does not have any built-in renewal or improvement structures. Total quality programs appropriately stress the importance of taking a continuous improvement approach to management. This can and should be combined with a focus on competitive benchmarking. This can help reinforce the necessity for

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