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Abstract: We investigate the trend among high technology companies to develop long term strategic partnerships with suppliers. Project team members researched through recently published literature related to new directions in engineering and manufacturing. Special emphasis was given to the internal management issues faced by a company seeking to develop a partnership agreement with a supplier, as well as the effective selection of products suitable for teaming up. Also considered are the processes of selecting organizations and maintaining the relationship once formed. The many benefits that may result from these partnership arrangements often outweigh the extensive investment and effort required to enter into them.

SUPPLIERS AS PARTNERS: A NEW
STRATEGIC DIRECTION

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Suppliers as Partners: A New Strategic Direction

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ABSTRACT

The trend among high technology companies to develop long term strategic partnerships with suppliers was investigated. Project team members researched through recently published literature related to new directions in engineering and manufacturing. Special emphasis was given to the internal management issues faced by a company seeking to develop a partnership agreement with a supplier, as well as the effective selection of products suitable for teaming up with suppliers. Also considered are the processes of selecting partner organizations as well as maintaining the relationship once formed. The many benefits that may result from these partnership arrangements often outweigh the extensive investment and effort required to enter into them.

INTRODUCTION

In recent years many high technology organizations have been opening their doors, research labs and even their checkbooks to supplier organizations in order to reap the benefits of what have come to be known as Supplier Partnerships. These partnerships go beyond the traditional supplier/customer relationships, at times even teaming up organizations that might outwardly appear to be in competition with one another. Certainly this process entails significant management attention and poses a challenge to both organizations. In the following discussion we will examine the management structure and attitude necessary to pursue partnership arrangements as well as the benefits that may be expected from these agreements. Also considered are the types of products that lend themselves well to a supplier/partnership arrangement and the maintenance of the relationship, once established, between two organizations.

Suppliers As Partners: Internal Management Issues

The formation of a partnership between two companies requires the involvement of both organizations from the upper management echelons on down. The organizational leadership structure must first accept the partnering process before the organization as a whole can. The characteristics of the management teams in organizations that have pursued partnerships and have been effective with them tend to have similar characteristics.

Management must direct the organization to commit to the partnering process. Widespread commitment, adoption and execution of the process will require many resources from the organization. Management must provide an atmosphere of confidence that the benefits from the process will outweigh the present demands. Partnering will put short term stress on the resources of an organization and the structure and support must be in place to handle this stress otherwise the results will be a failed partnership.

The partnership should be designed and supported such that downturns in business do not destroy it. Partner relationships should flourish, or at least survive, even in stressful times. Management is the group which must lead this issue with sound business practices. Long range planning instead of an

overemphasis on present quarter revenue numbers is a key aspect of this. The reduction of suppliers and the forming of partnerships puts all parties involved in vulnerable positions. The broad based supplier and customer chain is shrinking. Management must commit to keeping partnerships active in periods of slow or negative growth because when the growth periods arrive, the partnerships must already be in place to reap the benefits. The time required to form a partnership might be longer than the period of prime business opportunity [8].

Management must be involved with the partnership process from a high level review standpoint. The generation and promotion of an environment where partnerships can flourish is important. Also important, though, is the involvement in the process itself. This involvement will lend credibility to the organization as it deals with suppliers and also will demonstrate management commitment to the process. Management must commit adequate time to the partnering process, including their own personal time as well as other critical organizational functions.

Management must support the partnering process and generate an organization where it can be successful. The organization itself will take on various attributes if it is to be successful in forming sound partnerships. One aspect of this is the treatment of intellectual property. Information gained in open exchange must be treated with respect and confidentiality. The

partnering process requires a close interaction between many organizations within the customer and supplier. The partners must be able to trust each other with sensitive information. The customer most likely will deal with direct competitors of their partners in acquiring other components. Information must be treated with caution. Also, in the partnership selection phase sensitive information will be passed from company to company. This information too must be handled with respect and confidentiality [2].

The organization must use reasonable and realistic milestones with their suppliers. The partnership is a two way street and must be beneficial to both parties. Reasonable milestones will enable the supplier to better plan his production activities. The supplier is depending upon the customer to actually require the product when he requests it. The customer must commit to generating accurate forecasts to improve the delivery schedules of the suppliers.

The organization must develop standards by which performance can be measured. These standards should be for products, processes, service and administration. The success of a partnership can not be evaluated if the standards by which it is measured continually change. Standards are a requirement to consistent and specific supplier performance feedback. This is

important if the partnership is committed to continual improvement.

Long term versus short term solutions to problems is another area where the organization must commit. The long term viability of the partnership as well as the individual companies involved must be considered in all decisions. The organization needs to place emphasis on the overall needs and mutual expectations of the partnership. The legal or formal aspects of the partnership should not be the dominating factors [3].

Organizations need to place sufficient emphasis on training and continual skills improvement. The upgrading of the skills in an organization will help the partnering process move smoothly. This is one way the organization can communicate the overall objectives of the partnering process to all individuals involved.

The organizational structure used to manage partnerships needs to fit into the culture and needs of the organization. Three organizational models have been used for supplier management: Supplier Partnering Manager, Supplier Council, and Partnering Management Organization.

Supplier Partnering Manager

Under the Supplier Partnering Manager organizational structure, management appoints an individual to work with several suppliers and act as the liaison between purchasing, engineering, manufacturing, and management. The manager is responsible for all communications between the two companies as well as resolution of quality issues, scheduling product and technology transfer. Acting as a Project Manager would, he leverages the resources of functional groups within the organization to accomplish the tasks of supplier/partner management.

Supplier Council

Under the Supplier Council organizational structure, management assigns a group of people the responsibilities previously discussed for the individual Supplier Partnering Manager. Under this arrangement, it is critical that clear lines of responsibility be drawn to avoid conflict and duplication of effort. Often, individuals within the council assume de facto management responsibility and effectively become a Supplier Partnering Manager.

Partnering Management Organization

Under the Partnering Management Organization, an organization is created with a Supplier Partnering Manager and a Supplier Management Council as a separate functional group within the parent organization. Unless there is a large and consistent workload within the scope of responsibility of the Partnering Management Organization this group often appears overstaffed during slow periods and then when times of critical need arise, have difficulty achieving vital milestones.

The Supplier Partnering Manager (SPM) is often the best technique for the management of relationships between partner organizations. Whether one individual is responsible for the interface between several partner organizations or a manager is set up for each company, there is one primary point of contact for all communications, reducing confusion by establishing clear lines of responsibility. When specific projects arise, the SPM can form project teams from the various functional groups within the parent organization to accomplish the necessary tasks and then dissolve the teams when they are no longer necessary. This minimizes the direct resources that are dedicated to the tasks of maintaining and developing partnerships. The SPM has the responsibility for making the partnership work at the customer and supplier level and must maintain excellent relationships with other organizations that impact the partnership.

The establishment of this type of leadership and organizational structure will lead to key results in the partnership process.

Partnerships are not just a technique pulled off the shelf by the purchasing department in order to get lower pricing or faster deliveries. Partnerships require fundamental changes in supplier relationships that affect design, manufacturing, quality control, shipping and corporate finance. They are not a panacea for poor organization or a simple way to offload tasks from an overburdened organization. Starting a supplier partnership program involves careful goal setting and preparation internally to accommodate new communication channels. Preparing a company to engage in partnering relationships involves changing expectations as well as habits of conducting supplier relationships. People within the organization of both the supplier and customer will have to change their way of doing things. Information that is traditionally held secret will be divulged regularly to outsiders.

In making the transition to new supplier relationships the current situation regarding the number of suppliers, volume of various products and future needs should be analyzed. From this assessment goals should be set in the following areas: reduction in numbers of suppliers, supplier proximity, improvements in

cost, quality and performance, reduction in overall time to market and capital investments.

Supplier Reduction

The first step in preparing an organization for better supplier relationships is to reduce the overall number of suppliers. The benefits of a reduced pool of suppliers are substantial. Reducing suppliers does not necessarily mean being sole sourced. Schonberger gives the example of a Honda plant that has one supplier producing all of the left taillights and another supplier producing all of the right ones [10]. Instead of multiple suppliers for each part the goal is to develop a minimum number of suppliers in each area of expertise. Fewer suppliers will give purchasing resources more time to maintain each supplier relationship. Quality Control will have fewer people to train and coordinate in delivering quality supplies to the manufacturing line. The goals of JIT should be incorporated into the partnering relationship. Quality control is implemented at the process level reducing or eliminating incoming inspection.

Partnership purchasing involves long term contracts without annual competitive re-bidding resulting in reduced overall acquisition costs. Paperwork is optimized in the delivery and billing process.

The remaining suppliers will see an increase in the volume of business in areas where redundant suppliers are maintained.

Less time is wasted performing supplier qualification. Follow-on projects naturally go to the supplier/partner with little internal review.

Supplier Proximity

Just in Time manufacturing is one of the primary goals that partnered supplier relationships help to accomplish. A supplier in a JIT situation is almost a partner by default. Forecasts must be shared, quality control is implemented across company boundaries and substantial investment in logistics, transportation and manpower are made before the first delivery is made. The distinction between a JIT supplier and true partner is in the level of risk assumed by the supplier in providing investment of time and resources in either the design of the component to be purchased or the production and delivery methods of an otherwise commodity item. Many distributors of standard electronic components provide JIT deliveries to their clients but few if any of the relationships they have with their clients can be described as partnerships. Contrast this with a power supply supplier that invests 12 man-months of engineering customizing a power supply to a particular customers specifications [12].

Suzaki characterizes suppliers as the extended factory. Proximity is very important but not essential. Well coordinated transport strategies can compensate for long distance. Examples are cited of daily deliveries of components to a factory in Chicago from suppliers in Texas, Missouri and Indiana utilizing the same trucks [15]!

In order to effectively utilize the advantages of a partner, good communication must be established between the design department and the supplier. Proximity can have a tremendous effect on the frequency and quality of communication. The nature of concurrent engineering requires diligent planning and specification development to keep the parallel efforts focused on the same end result. Close proximity should be an important consideration but not the dominant criteria. Careful analysis of the long term costs of a distant supplier should be examined. Sometimes the desire for local design resources is outweighed by the economies of scale available at a distant supplier. Local suppliers may lack the expertise and/or capital equipment as well as the willingness to invest in the latest techniques for design and production. In some cases the supplier is actually nearer to the end customer and it is more expedient to ship material to the partner/supplier for final assembly and then drop ship from there to the end user [13].

Cost, Quality and Performance Improvements

Value engineering and analysis of earlier designs can point out areas for improvements in design, manufacturing, packaging and shipping that can result in lower costs and higher quality. Goals should be set for improvement in existing product lines or for implementation in future products. These goals should relate to the contribution that can be made by the supplier as well as internal resources.

Reduced Product Development Cycle

The investment in partnership relationships with suppliers that are capable of substantial amounts of design work can dramatically reduce product development time. The design expertise available in the specialized environment of the component manufacturer can rarely be duplicated in a general manufacturing company. Having the early involvement of these experts in the specification phase of a new product can save many iterations in the prototype cycle as well as reduce the total number of engineering resources required for the project. Many companies such as XEROX have experienced substantial savings in time to market by reducing the number of new parts designed into a new product. Every new part designed into a product has an associated risk inherent in it's development. Will it perform as specified, will it cost as projected, can it produced in

sufficient quantities to meet demand? All of these risk factors should make a design team think twice before attempting to innovate on every component in a new system. Using an experienced supplier is one step closer to using off-the-shelf components. The design cycle can be reduced when the subsystems can be developed in parallel [7].

Capital Investment

Part of a partnering arrangement may involve mutual investment in capital equipment and plant capacity. This will probably be the most touchy part of any arrangement. The management of both companies will need to be committed to the process and trust that benefits justify the risks. There is significant advantage in enhancing the capabilities of a trusted supplier rather than falling into the vertical integration trap. Bringing a specialized operation in-house requires that a new area of expertise be developed and maintained within the company. Unless it is very close to the companies core business the investment is likely to languish into obsolescence. Investing in a local supplier can have significantly greater long term benefits than an equal internal investment [11], [1].

Suppliers as Partners: Product Decisions

Once the organization is committed to the partnering concept and the management structure is in place to make the venture successful, the next vital decision to be made regards which products or services should be targeted for partnering. The decision is not one to be taken lightly as the investments required will be significant and the duration of the relationship will likely be long, so the ill effects of a frivolous partnership venture could remain for a long period of time.

Younger or less vertically integrated organizations often lack some specialized function within engineering or manufacturing that make obvious candidates for good supplier/partner relationships. Barring any obvious lack of expertise within the parent organization, the following method is proposed for the selection of which products would be good candidates.

To facilitate such decision making, a team consisting of representatives from design engineering, procurement, quality assurance, marketing and manufacturing should be formed to determine the criteria that are crucial to the success of the new product. Since the specifications for each new product are unique, the criteria would differ from product to product.

Once the criteria have been decided upon, weights should then be used to prioritize them in order of importance to the overall success of the system. A matrix can be set up with the criteria in columns and subsystems in rows. The team would assess the partnership impact of each criterion with respect to each subsystem and assign a weight ranging from zero to one to each cell in the matrix, a rating of one indicating highest importance. (Figure 1a).

For example, suppose a company is developing a new computer. The development team has listed the following six criteria and has assigned weights to them: Quality (1.0), Cost (0.9), Volume (0.8), Design (0.9), Location (0.5) and Lead Time (0.7).

The team has also identified five subsystems that will not be developed in-house and will need to be purchased. A decision matrix is established to assist in determining which subsystem(s) likely will be good choices for pursuing partnering relationships with the suppliers.

In the example, it is assumed that the power supply would require modification of a standard off-the-shelf model, consequently the design requirement is set high (0.9), reflecting the need to have an excellent design team within the power supply supplier's organization. Because a high level of interaction

would be expected between this design group and that of the parent organization, location also receives a relatively high rating (0.8). Quality is assumed supremely important for every component and the weights for all five items are assigned 1.0. In the cost column, less expensive components that do not have as much impact to the overall system cost receive lower ratings than the more expensive items like the monitor and hard disk drives.

The table in Figure 1b indicates that the power supply and monitor have the highest weighted index and the best candidates for partnerships would be with suppliers of these two products.

Upon identifying products or components as good choices for pursuing supplier/partner relationships, it is important to have products carefully defined so that there is no confusion about what the requirements and specifications are.

The need for a clear, concise purchase specification cannot be overemphasized. In harmonious partnerships, each party knows what is expected of them and the consequences for not meeting those expectations. There are several advantages to purchase specifications including:

1. Provides concrete evidence that careful study has been put into determining that the component can function as intended and to the characteristics needed to satisfy the need.

2. Provides a standard reference for judging suitability preventing any delays or unnecessary costs due to unsuitable material.

3. Puts additional responsibility on the supplier to meet commitments.

Some of the disadvantages, however, are:

1. There are many items for which adequate specifications cannot be formulated.

2. It may not be practical to commit the necessary expense to writing a specification if the volumes are small.

3. Improperly written specifications may lead to a false sense of security and reduced vigilance.

4. A supplier meeting specifications may not feel compelled to improve on their own.

As a general rule, it is good purchasing policy to inform the supplier as fully as possible regarding the specific use for which the product is intended, how it is to be applied, and the performance level it is expected to maintain [5].

Although it is clear that some form of specification needs to be written, specifications are the exception to the rule that 'more is better'. So the question naturally arises, as to what should be specified. There are four major choices available for specifications [6]:

1. By physical or chemical characteristics.
2. By material or method of manufacture.
3. By standards (MIL, ANSI, ISO, FCC, UL, CSA, VDE, etc.).
4. By performance.

In high technology industries, the performance group is the most predominate. This group is more results and use oriented and includes, among other things, quality and reliability. Of course, this specification group is the most difficult for a manufacturer to adhere to and puts additional responsibility on the purchasing company in terms of supplier evaluation and selection.

Perhaps the most important single criteria to be specified is quality. It also happens to be one of the most elusive criteria that resists attempts to categorize it. In the high technology

industry, some of the more common measurements of reliability and those that are found most often in purchase specifications are [4]:

1. Mean Time Between Failures (MTBF). This is usually expressed in thousands of hours and represents the average time between component failures. The difficulties faced in using MTBF as a common means of determining quality is that the method for computing this vary between manufacturers, that it is dependent on a particular usage model, and that it cannot be used to determine when an individual component will fail.

2. Annualized Field Failure Rate (AFFR). Expressed in percentage form and closely related to MTBF, indicates the percentage of a particular component installed at a particular time can be expected to fail within a year.

3. Incoming Failure Rate (IFR). Expressed in percentage form this indicates the percentage of components that can be expected to fail within the first few hours of operation. Purchasing companies will usually increase orders based on this percentage to insure that an adequate supply is maintained.

Leenders suggests that quality should not only be measured in terms of device performance, but should include other measurements such as price, device procureability, and total cost

of ownership. This concept, which he refers to as "economic ownership," allows a company to include both technical and business reasoning in determining the best buy.

Suppliers As Partners: Selecting a Partner

With the organizational commitments made and target products identified, the next step is to identify potential suppliers as partners. Potential suppliers are identified and the partnership managers for each target element of the system will initiate contact with the possible suppliers for each element. The focus of the initial contact will not be discussions of the product requirements and cost issues, but will first focus on supplier capability and an attempt to measure the commitment the potential supplier has to the formation of partnerships.

Examples of areas to be addressed in the initial phase of contact will be: willingness to allow design team interaction, design team competence, willingness to share financial data and accept long term pricing agreements, commitment to quality, commitment to technology development, and commitment to maintaining the required manufacturing capacity.

To measure the partnership commitment and to determine some initial design and manufacturing capability, the partnership manager should travel to each facility and evaluate them per the supplier matrix in Figure 2a. For each of the criterion there will be certain weights which will differ product to product. In Figure 2b there is a sample evaluation matrix showing the scoring

method used. The partnership manager will score each supplier for each criterion from 1 to 10 then those will be multiplied with appropriate weights and a total score for each supplier will be reached. The intention of the supplier matrix is to attempt to place some quantitative measure on the commitment towards partnership of the possible suppliers. The evaluation will be completed by one person and is intended to narrow the field of possible suppliers down to a small, manageable number.

Once a small number of potential suppliers has been identified, a supplier qualification and selection team will be sent to each company to completely review the capabilities in each area of operations from design to manufacturing. It is important that each evaluator keep in mind the partnership focus during this stage to not come off as an auditor but as someone who is trying to work with the supplier to determine if they are compatible for a long term business relationship.

The intention of a supplier evaluation is to ensure the supplier has the capability to deliver the product within the cost, delivery, and quality requirements and that there is a compatible long term strategic direction between the organizations which would make a partnership profitable. The evaluation team should travel to the supplier and review the company per the criteria discussed in the supplier evaluation matrix (Figure 3a - 3e). The travel team should consist of the

required personnel to cover all the functional organizations within the supplier, at a minimum including representatives from Design Engineering, Manufacturing, Quality, Finance, and the Supplier Partnering Manager. Each person should review the appropriate areas within the company that affect them and evaluate the compatibility between the two companies.

After the evaluation, the totals for all of the sections should be added up. Each section is considered equal with the exception of the management section which deals with partnership abilities and is considered twice as critical. The total score for each section should be normalized per the number of questions asked on the section. Candidates for partnership should have a minimum score of 18 or higher to be considered for a partnership (maximum score of 25). A score of less than 18 likely indicates that forming a long term partnership with this supplier is not in the best interest of the company at this time, however, it does not mean that the supplier can not be used. It only means that the additional investment for a partnership relationship may not be justified.

The most important part of the supplier qualification process is development of a purchasing/partnership contract between the two companies. The contract needs to clearly define what the goals are of the partnership and what each company will supply to each other such that misunderstanding will not lead to distrust

between the two companies, effectively dissolving the partnership.

Once a supplier/partner has been selected, procedures need to be put into place to facilitate and manage partnership development such as technology and product transfer, new product development strategy and direction, methods of quality resolutions, and contract/pricing updates. A partnership contract needs to be developed establishing the following:

- 1) Partnership objectives and goals, business objectives
- 2) Partnership team and how it will be managed
- 3) Total cost schedule
- 4) Quality and delivery commitments
- 5) Long term strategic direction
- 6) Technology transfer procedure

Partnership Objectives and Goals, Business Objectives

Having a common direction for the future is a major requirement for a long term partnership. Excellent candidates

for partnerships are organizations growing at similar rates, engaged in complimentary technology sectors and even more important, where there is a strong likelihood that the selection of the initial product may lead to follow on business with future products from the supplier company. Partnership is not something that will bring an immediate return on the initial investments. When two companies first form a partnership, both organizations may at first be hesitant to completely share information. The supplier will most likely not divulge all of the internal quality problems for fear of losing the business, while design may be hesitant to share new product development information for fear of the developed technology also being sold to competing companies. The partnership will take time to become effective and must be considered a long term relationship.

Partnership Team and How It Will Be Managed

It is critical that the method of management chosen within the two organizations is compatible. Should one company choose to manage a partnership with a supplier council and the other elects to appoint a partnership manager, there is a potential for conflict. In a supplier council arrangement, one person from each functional group will want to communicate with a counterpart in the other company. If the other company has set up a partnership manager, he will be the 'point man' for the communication and may frequently be left out of the loop, missing

out on critical communications. Delays in communications caused by this type of problem could lead to mistrust and a breakdown of an otherwise effective partnership.

It is important that each company meet the expectations of the other company and at a minimum, communicate what problems they are experiencing with the schedule. Both companies are relying on the other to maintain profitability. Not meeting the agreed upon expectations could be a major reason for dissolving the partnership.

Total Cost Schedule

A major benefit arising from forming a partnership is often the ability to reduce the cost of the product. These cost savings fuel the payback needed to sustain the management commitment. Cost reductions over the life of the product should be shared by each company. Cost data should be continually transferred between the two companies. A perceived cost advantage of one company over the other could also lead to distrust.

Quality and Delivery Commitments

It is critical to the success to any company to deliver products when the customer expects them and that they function as

promised upon arrival. There must be a mutual understanding between both organizations on the value of quality and it's importance to the partnership. Quality and delivery issues need to be disclosed as soon as possible so they can be resolved at the earliest possible time. The sharing of quality and delivery problems can be one of the hardest parts of the partnership to establish due to the tendency among most organizations to want to resolve all problems internally.

Long Term Strategic Direction

As previously discussed, partnerships are for the long term. It is critical to the success of the partnership that regular meetings be held to establish future directions of the organizations so technology development can be planned such that each company benefits. Mutual development programs will lead to faster times to market which will help keep both companies competitive.

Technology Transfer Procedures

One of the most critical parts of the product development cycle is the transfer of a new technology from one company to another. Miscommunication generally leads to the technology not working correctly and will slow down the product development cycle. The technology transfer procedure should detail how the

transfer should take place including travel of the required people to each company. At a minimum, the supplier should be responsible for installing the initial products and ensure they work as designed. They should also take part in any training aspects associated with the transfer. Clean, seamless technology transfer is a required element of a partnership where engineering, design and manufacturing resources are shared.

Sustaining the Partnership

The most important part of sustaining a partnership is clear communication. To allow for effective communication, regularly scheduled meetings with predictable preset agendas should be called by the partnership manager. The locations of the meetings shall be appropriate to the main topics of discussion, at the manufacturing site if there are produceability issues to discuss for example, but they should reasonably rotate between facilities, especially when there is significant distance and travel cost involved.

A suggested schedule of supplier/partner meetings follows:

Monthly:

- Review Partnership Goals and Objectives
- Review quality indicators and resolution plans
- Review 6 month delivery requirements
- Review cost targets
- Review new product development status/issues

Quarterly:

- Review Business trends
- Review technology trends
- Management review of current product development projects
- Management review of quality and cost indicators

Yearly:

- Set yearly goals and objectives for product development, cost, and quality
- Establish key results expected of partnership in the coming year
- Review annual research and development, and capital expenditures

Forming a partnership with a supplier over the long term becomes easier to manage. It allows for each company to focus

more on cost reduction, quality, and technology development than on expanding efforts on supplier audits, new product development, and daily responses to product order changes. After the partnership contract is formed, the partnership will require some type of sustaining activity to ensure the partnership gains are realized.

Several companies have unique methods for sustaining supplier relationships. Polaroid has a unique program for managing its partners referred to as Zero Base Pricing. Polaroid first gets a clear understanding from each supplier on why the product cost is what it is. They then do not accept any cost increases without Polaroid people visiting the supplier's plant to determine methods of offsetting the cost increase. The net result is that Polaroid understands what makes up the product cost and are willing to get involved with resources to keep those costs as small as possible.

Northern Telecom has implemented what they call "power marketing." Telecom has organized a Technical Advisory Council consisting of 22 of its key suppliers. The purpose of this council is to speed up product development and even to select products. Members get their engineers involved in design reviews, product approvals, and enhancements before the design is locked in. They also participate in testing and gain intimate knowledge of Telecom facilities and capabilities.

Motorola also has a supplier advisory board which consists of major suppliers and is tasked with giving suggestions to Motorola on how they can be better partners. In this example Motorola has invested in developing an advisory board from which they get input on how well they are doing from a supplier point of view.

Suppliers As Partners: Realized Benefits

By partnering, improvements will be made in the total cost of ownership [14]. By applying JIT manufacturing more effectively, the inventories will decline, therefore the working capital turnover of the company will increase, resulting in increased profitability for the company.

Reductions in the volume of paperwork required in the acquisition process help decrease the time from purchase order to delivery [1].

Elimination of packaging could improve costs. Deliveries made directly to the factory assembly lines instead of warehouses using re-usable instead of disposable packaging will decrease pack/unpack and handling costs.

Price stability will be reached by partnering resulting in stronger confidence in budget figures. Sharing financial data will result in better understanding of product costs among each organization. Price increases or decreases based on agreed profit margins with openly disclosed financial data between organizations result in successful partnerships. The financial strength of both companies will likely improve from decreases in operational costs.

In partnering dedication to highest quality of service will increase product quality. Continuous quality improvement will be a way of life. Quality will be a shared responsibility, with customers identifying issues and sharing with suppliers in the resolution process.

The information on capacity plans, product plans and demand forecasts causes the supplier/partner to design, buy, build and ship intelligently avoiding schedule problems [10]. Stable delivery schedules over a set period allow suppliers to improve price and quality.

Improvement in reliability and maintainability can be reached through partnering [1]. Resolution of field problems by members of each company result in a better understanding of the failure mode enhancing long term resolution.

By working together, there will be better knowledge of the future technology development capabilities and directions of the partner as well as direct input from customer to supplier about preferences for investments, effectively increasing the value of each R&D dollar spent [9].

As we have seen, forming and maintaining partnerships is not a trivial task and should not be entered into lightly. However,

many organizations have reaped great benefits from the effort. Establishing a partnership with a complimentary organization can help a company meet the new manufacturing challenges by drastically reducing product development time to market and reducing overall system costs.

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