

Total Quality Management:
Rational Prerequisites & Expectations

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Table of Contents

Introduction to Total Quality Management (TQM).....	3
Advantages of TQM	4
Criticisms of TQM.....	5
Quality Assurance Vs. Quality Control	9
Prerequisites & Expectations	10
Financial Stability and Organizational Support.....	10
Initial Investments.....	11
Financial.....	11
Structural.....	14
TQM in All Departments	17
Quality Chains	17
Vendor and Supplier Relationships	19
TQM in Production Departments.....	21
Process Organization	21
Feedback Loops	23
Supporting Initiatives.....	25
Case Study Example	28
Discussion.....	32
Conclusion	34
References.....	35

Introduction to Total Quality Management (TQM)

In the early 1920's, research into the relationship between statistical theory and quality control had started (Business Performance Improvement Resource 2002). The research was attempting to develop a method to prevent product defects by detecting and correcting issues within the production line. The philosophical bases of this quality research stated that a variation in process would lead to a corresponding variation in product (Business Performance Improvement Resource 2002). By the 1940's, Japan and America were ahead of the rest of the world in quality research with developments by now famous Quality Gurus: W. Edwards Deming, Joseph Juran, Kaoru Ishikawa and A.V. Feigenbaum. Ultimately, Total Quality Management was created and is now commonly practiced by successful companies. TQM is now recognized as a professional discipline and important in every role of every organization: goods and service industries, consumers and academics (The American Society for Quality 1993A).

“Total Quality” was initialized in 1969 when Feigenbaum, at a conference in Tokyo, began to address not only production, but issues within organizations (Business Performance Improvement Resource 2002). The concept of “Company-wide Quality Control” quickly spread to become organization-wide quality issue resolution (The American Society for Quality 1993A).

Total Quality Management is defined as a practical method of solving problems. It is a management philosophy turned social movement; it includes technical interventions and initiatives which feature (Powell 1995, Zbaracki 1994):

1. Achieving Customer Requirements, Maximize Customer Satisfaction
2. Quality Work - Reduction and Elimination of Rework
3. Employee Empowerment, Team-Based Problem Solving
4. Continuous Improvement and Constant Measurement of Results
5. Improve Relationships Through Supply Chain Management

Advantages of TQM

Organizations which implement TQM philosophy successfully report improvement in all of the above-listed areas as well as an increase in employee morale and commitment. (Bowen and Lawler 1992). The success of TQM is strongly associated with four organizational factors: Quality, People, Organizations and Senior Management. The main advantages of TQM include improved product, reduced production time, increased customer satisfaction and employee satisfaction and of course, improved financial outcomes.

All quality leaders state that the purpose of TQM is to keep organizations in business through the preservation and health of the organization and its members (Hackman & Wageman 1995). Businesses which implement TQM are able to adapt better to a demanding marketplace. The roles and relationships of TQM initiatives form the basis of a strong competitive stance for any business in any industry.

In a study printed in *Administrative Science Quarterly*, 80% of TQM organizations reported noted improvements. The four most frequent improvements were (1) reduced error rates, (2) decreased production time, (3) increased cost savings and (4) reduced employee turnover (Hackman & Wageman 1995).

Criticisms of TQM

Despite its success stories, TQM is also subject to criticism. Many management fads have rolled through businesses and industries, each promised greater organizational efficiency and a positive impact on company profit margins upon implementation. Re-engineering and Lean Philosophy are among the most recently explored. To some, TQM seems to be just another assertion of social psychology with no impact on the bottom line. (Powell 1995)

The most basic argument against the effectiveness and validity of TQM is based around its initial cost. The production of poor quality products incurs costs such as loss of customers and high rework costs. However, the cost of implementing new processes to rectify and improve a current process flaw may be far greater comparatively and even infeasible and counter-productive (Hackman & Wageman 1995). Critics say that TQM concepts fail to understand that every environment is different; TQM oversimplifies and underestimates the actual costs and efforts required to restructure a corporate climate (Sahni & Gaertner 1996, Kerr 1993). Further, excessive management time and unattainable employee commitment levels are required to maintain the increased paperwork. (Powell 1995)

Businesses take the operational changes which they can easily adapt to, and leave the more difficult disciplines behind. In the most basic example, not many companies maintain statistical process control programs after the TQM initialization period. The largest quality issues are often caused by process variation; the only persons capable of validating, controlling and monitoring such problems are those on the front-line (Hackman & Wageman 1995). Sufficient evidence does not exist, proving the continual use of statistical process control by any employee or department. This prevents the promotion of “management by fact” which is the fact-over-data basis of TQM and demonstrates TQM as being difficult to maintain (Lerch & Mukhopadhyay 1994)

Customer satisfaction and quality are also a target or criticism. One way of handling customer requirements is to focus on the controllable factors affecting the product quality while another method involves the manipulation of the customer. Marketing agents can be hired to instill in the customer their need for a product which the company can make, moving the customers’ attention from the product they originally requested. The customer requirements can be redefined to accommodate current production methods, and quality levels (Lerch & Mukhopadhyay 1994). Through manipulating a customer, a company may display a customer-focused attitude while not actually providing quality work, thereby increasing customer satisfaction without changing any internal factors.

Another major factor inhibiting TQM is the idea that its performance cannot be measured. Managers and CEO’s are after clear measures of performance while TQM

does not allow for concise measurement of its effect on an organization. The standard measures used in any profitable organization include changes in market share, profitability and price of stocks (Sahni & Gaertner 1996). Further, in the public sector and non-profit organizations, these measures are invalid. Reduced measurements such as monitoring and compiling the effects of TQM at each level in an organization may produce a clearer total outcome. However, deriving the effect of TQM by measuring employee performance is a long and tedious task, one with many linkages. Not many companies could accomplish this task fully or accurately (Lerch & Mukhopadhyay 1994). Further, employee attitudes affect their job performance, and quality issues can be the result of negative employee attitude or interaction with others or technology (Bowen and Lawler 1992).

Ultimately, critics say that the implementation of TQM may be successful and lead to a “happier” work environment but, the global market is very unstable at times and performance in the market is affected by an industry-wide decline due to factors uncontrollable by single organizations. Therefore, even with the best TQM processes and continuous improvement in place, no guarantee of remaining in the marketplace exists (Hackman & Wageman 1995).

This essay is not meant as a “how to guide” for TQM implementation, but will analyze the elements of TQM and the impacts of organizational factors on the success of TQM. Though TQM can be applied in any organization in any industry, this essay will focus on the manufacturing industry alone.

The essay will start by differentiating between Quality Assurance (QA) and Quality Control (QC) to dissipate the notion of the two being equivalent and ensure the reader understands that QC is an element of QA. After eliminating that common misunderstanding, this essay will examine the financial and structural prerequisites and expectations required by a company before it considers implementing TQM. Many organizations move towards implementing TQM without proper research and preparation, ultimately leading to the abandonment of TQM philosophy for illegitimate reasons. Further, the essay will focus on non-production departments within an organization and its impacts on TQM through; Quality Chains and Vendor/Supplier Relationships. To end with, the real impacts of production departments will be illustrated including the importance of; Process Organization and Feedback loops. An example case study including descriptions of TQM tools will follow.

Quality Assurance Vs. Quality Control

- Quality Assurance is a process improvement program
 - Includes the use of analytical tools for data collection and analysis.
- Quality Control includes Statistical Process Control
 - Focus on detecting production specific issues to prevent defective product
- Quality Control is a foundational member of Quality Assurance.

Quality Assurance (QA) is the program whereby processes are improved and maintained to prevent and avoid defect-causing issues. Quality Control (QC) is comprised of action oriented concepts meant to utilize various analytical tools to collect and test data in anticipation and to prevent the creation and release of defective output (Ishikawa 1990). Quality assurance and quality control should not be implemented as stand alone programs as they work cohesively together; QC is a foundational support of QA.

Statistical quality control/Statistical process control is one of the strongest QC tool sets available. Full understanding of this requires the training of production personnel and access to knowledgeable QC professionals. QC does not look to single out poor performing employees but instead assumes that 90% of problems are directly related to process issues and nothing to do with employees (Ishikawa 1990).

Quality tools focus solely on the detection of production issues and the control of defective product and processes (Business Performance Improvement Resource 2002).

Physical effort is required to test samples while statistics is used to apply inference theories. This allows companies to make credible judgments of populations based on samples within the population. For example, the data collected from a reasonable sized sample within a batch of products can be used to determine the quality of the entire batch, just as surveys taken relate information from a smaller group to an entire population. Samples are gathered from products at specific stages in the production cycle to determine the greatest areas with and causes of variance (Business Performance Improvement Resource 2002).

Prerequisites & Expectations

Financial Stability and Organizational Support

Critics of TQM address its large start up costs and non-existent measurable. TQM's hope-based outcomes can be refined and tracked as profit values but require the employees in the front line to understand, analyze and improve their work procedures (Kerr 1993). Coaching is required for this level of knowledge to be attained by the average worker. Further, employees capable of understanding the job model should be encouraged to test solutions. It is necessary to strategically position employees who can access front line data and implement improvements (Lerch & Mukhopadhyay 1994).

The most important, and perhaps largest, required investments include staff training in problem-solving and statistical process control. However, investments may not be

required depending on the extent of the company weaknesses. Two main categories of weaknesses are: organizational processes and corporate culture (Whiting 2003). Before implementing TQM, businesses must be ready to consider corporate changes such as relationship alterations within the supply chain, development of customer criteria standards, and the creation and use of cross-functional team to solve problems holistically, using multi-disciplinary knowledge and experience (Hackman & Wageman 1995). It must be understood and every job and each employee is subject to participation in continuous improvement to successfully apply TQM. Within corporate changes, behavioral processes are targeted; organizational support is required to promote and adapt methods of motivation, learning and change (Hackman & Wageman 1995).

Initial Investments

Financial

- Initial cost of TQM depend on the current state of each organization and its needs
- Profit increases resulting from TQM practices are difficult to decipher
 - Cost avoidances by eliminating rework are impossible to calculate
 - Cost of Quality and rework trends can help monitor improvements
- Costs of TQM are easy to determine; mainly training and team development
 - A new section in accounting table can be created to track costs
 - External agents can be hired to complete employee training

The total cost of initial investments often determines whether or not a program will be implemented. Determining the cost of implementing TQM philosophy and practices is fairly easy to do as the costs of training can be accounted for. However, the increase in profit as a result of TQM is very difficult to decipher (Kerr 1993).

TQM consists of two major initial costs; training and team development, but only if they are necessary. The extents to which they are necessary play a significant role in the total initial cost. While in employees are in training, the company loses productivity time, an opportunity cost. Aside from lost productivity, the remaining costs are negligible. Risk factors can be used to determine the extent of TQM urgency based on the severity of business operations and their consequences. Understanding that uncertainty exists in every situation, management must deter crises and plan for appropriate use of resources to accomplish required tasks. Implementing TQM is reducing the risk of crises by reducing uncertainties in the organization and regaining control of operations. This allows for better preparedness in resource allocation and ensures smooth production flows through the year and into the future (Kaplan & Norton 1992).

Knowledge in statistical process control is required to fulfill the management by fact principle of TQM. The obtaining, use and tracking of data to solve problems requires extensive knowledge. Root causes of problems must be traced before solutions can be provided (Hackman & Wageman 1995). Training staff in statistical process control and the problem-solving-cycle may require much training and support time as there are many analytical tools to learn before the staff can use them as support in their methods of

problem solving. Statistical process control and the problem-solving-cycle rely on each other and are fundamental to TQM strategy (Lerch & Mukhopadhyay 1994).

Training may be categorized as training cost or a support cost, reported on cash flows and tracked as any other business cost. Training may be a continuous cost as teams are formed and collaborate through the year to solve problems and strengthen initial training and learned skill sets. The increased profits attributed by TQM are not accounted for in a separate category from those already existing in a company. Production efficiencies, total output and cost of quality type measures can be used to monitor improvements but to actually link the total effect of TQM to be produced on an accounting statement is difficult to determine (Sahni & Gaertner 1996).

One method of measuring the importance of completing jobs right the first time is monitoring the cost of rework. The total cost of rework can be directly accounted for as the problem is fixed. Monitoring these costs can aid company's in determining the points of errors and highlights areas and processes needing improvement. The largest methods of cost savings can be found by monitoring cost of quality and continuous improvement must exist until reworks are eliminated (Hackman & Wageman 1995).

Outside agents may be hired to implement training if the current staff does not have the appropriate skills and capabilities. While in-house training is always the least costly method of training, many institutions and accreditations have been created to produce experts in the field of TQM who may be hired as consultants and trainers. These

institutions work with management to instigate TQM ideologies and spread techniques and philosophy (Hackman & Wageman 1995).

Structural

- The commitment of senior management is imperative to TQM success
- Employee motivation and corporate culture are the greatest driving factors of TQM
- Continuous improvement should be a way of life to keep up with market changes
- Team-based, cross-functional, problem solving promotes holistic solutions
- Eliminate fear and quotas to encourage communication and divergent thinking

Aside from improving product quality and setting up the framework for a diverse company, TQM carries positive organizational by-products including the concept of total quality throughout an organization, employee motivation and role of senior management.

No quality improvements can be made without the approval of management. It is imperative that management understands and promotes the philosophy and practices of TQM. Managers create the products of and processes used within an organization. The efficiency of employees is dependent on the quality and effectiveness of management developed systems. If managers have opposing views of quality, those differences will be reflected throughout the organization in the form of miscommunications and in the creation of defects. It is important that all managers take the same understanding of TQM

and express a single vision. That vision should be implemented through the

organizational strategies and every communication produced (Hackman & Wageman 1995). This will often bring about positive change through the entire organization.

Ultimately, it is up to senior management to ensure the workplace is safe and efficient. But the new challenge is ensuring that maximum efficiency is achieved through open communication and critical analysis of the organizations methods of business. Quality issues end with the input of management who are ultimately responsible for the output of an organization (Hackman & Wageman 1995).

Once management and employees are united in their understanding of quality improvements and the reasons for them, continuous improvement ought to be facilitated through participative management (Eskimo 2001). Quality improvements, like any other process or program, need to be revisited and improved as changes are made, including technology changes and markets shifts. As long as defects occur, the opportunity for improvement exists. Following continuous improvement, employees will continue to improve their work and intern, keep learning about their work and role (Lerch & Mukhopadhyay 1994).

Spreading the understanding that quality does not just refer to physical products but affects all processes and interactions within an organization is not only a by-product but a foundational requirement of continuous improvement (Business Performance Improvement Resource 2002). Once employees understand that business is comprised of interdependent parts, they will work together to solve the problems that cross

departmental borders. Strengthening the internal bonds and ensuring increased efficiency within the organization is just as important as reducing production times. Everyone affected by an issue should be involved in the problem solving and solution testing exercises. The use of cross functional teams leads into increases in employee empowerment, another major by-product of TQM (Business Performance Improvement Resource 2002). Not only are employees capable of working together to address organizational issues, but within their own department they can target local issues, set goals and objectives (Kaplan & Norton 1992).

Employees appreciate being involved in decision-making and strategizing, especially if their ideas are heard and encouraged (Business Performance Improvement Resource 2002). Employees care about their job and the way their job is done. Employees will take the initiative to improve their work if they are supported. Employee motivation and change in corporate culture account for over 80% of effective TQM implementation (Bowen and Lawler 1992).

Quality improvements often require new tools, physical and analytical, training, encouragement and follow-through. Management must take seriously the advice given and requests made by employees. Otherwise, employees become discouraged, believing nothing will ever change, or improve, employees stop contributing improvement ideas (Bowen and Lawler 1992). In the encouragement of ideas, negative attitudes in the organization must be removed. The elimination of fear and comparative employee

evaluations and punishment will prevent the organization from having an open culture, conducive to idea creation and exploratory thinking (Hackman & Wageman 1995).

TQM in All Departments

Quality Chains

- A Quality Chain is a sequence of value-adding units, each a customer and supplier
- Customers should be given a method of product rating to collect feedback
- Customer satisfaction is the ultimate goal
 - Customers are in direct control of sales
- “Customers” includes internal and external, any body on the supply chain
- Use quantitative and qualitative analyses to define customer requirements
- No item leaves a department until all customer requirements are met for that component

Customer satisfaction is the start and drive of TQM. All staff must understand this fact as management is often seen as the boss to please whilst customers are the true judges of quality of service, product and are in direct control of whether or not repeat business will occur. With the customer-satisfaction approach, top-down management is removed and a customer-driven focus is used in decision making (Kaplan & Norton 1992). Complex organizations find this approach to be holistic in nature.

Determining customer requirements will allow an organization to fully understand what the customer requires. This guarantees customer satisfaction. This task of determining customer requirements is easy to underestimate as it takes more than a general description to understand customer needs (Juran 1974). Quantitative and qualitative analyses are required to identify and measure customer requirements (Hackman & Wageman 1995). Such descriptive and in-depth reporting of customer requirements ensures the basic unit produced is as required by the customer. Further, non-product features, such as speed of service, product reliability and warranty, add to the customer experience and may be used as competitive advantage. Customer requirement data should be kept on hand. Such data can be obtained in direct ways including information meetings, follow-up phone calls and surveys. (Kozak, 2009) Many companies choose to utilize indirect methods of data collection to avoid conflict or embarrassment on either side. Toll-free complaint lines, customer focus groups are commonly used. Marketing research firms can be used for information regarding large markets (Hackman & Wageman 1995).

One important concept is that of internal customers. The basic premise of this is the idea that not only is the end user the customer, but any party receiving output is a customer. Nothing should leave a department until it is entirely complete (Bowen and Lawler 1992). Internal customers are employees or departments within a value-adding process which are receiving output from another within the department. For example, in a production environment, the final assembly team is a customer to the finishing team. The final assembly team is receiving product from the finishing team and the product must

meet their standards, such as visual quality, all sides requiring finish are finished and correct finish was used. If the product standards are not met, the final assembly team must return the product to the finishing team as a rework, a defective product requiring repair. The enforcement of internal customer attitude ensures that workers along the value chain are not depending on the workers at the last step to clean up mistakes. This also makes it easier to track which departments are having the most issues and the most common types of issues arising (Hackman & Wageman 1995). For example, if many products have to be re-finished, that department will require quality emphasis and support.

Vendor and Supplier Relationships

- Work closely with suppliers and vendors, form a relationship through teamwork
- Require suppliers to meet stricter Quality specifications
- Require suppliers to adopt a Quality program

Within the supply chain, a further extension of the internal and external customer concept is the vendor and supplier relationships. Historically, cost was the basis of determining the value of a product. However, organizations should measure the value of the purchase in terms of quality (Hackman & Wageman 1995). It is imperative that organizations work closely with their suppliers as if they were a department within the organization (Powell 1995)

Suppliers of an organization are not just suppliers but partners. Strong and positive vendor and supplier relationships promote the success of TQM within an organization (Kaplan & Norton 1992). In today's dynamic and fast moving market, organizations cannot risk their own customers by continuously changing supplier when an issue arises. Good partnerships are formed by clear communication and teamwork. Organizations should move towards working with their suppliers in a partnership to ensure quality specifications are met and the correct product is obtained and can be reproduced (Hackman & Wageman 1995). A supplier who is appreciated is able to secure a customer, while the receiving organization can gain confidence in the supplier and avoid having to "shop around". Statistical data in a few studies stated that vendor and supplier relationships have a greater impact on organizational improvement compared to process changes in production environments (Kaplan & Norton 1992). Together, suppliers and organizations can increase the connectedness of their resources to produce goods faster. (Powell 1995)

One study showed that at least 50% of organizations which follow TQM philosophy work in collaboration with their suppliers to increase and maintain the quality of their purchased sub-components. In the event of non-conforming product, organizations should send their quality representatives who understand the product to consult with the supplier. Together they can analyze the supplier process and implement TQM methodologies to assist in supplier production (Hackman & Wageman 1995). Ultimately,

the suppliers will form a quality program; a benefit to the customer organization and supplier (Powell 1995).

TQM in Production Departments

Quality in America is historically associated with production as it became an important topic in military related production during World War II. Employees worked in large factories and were paid by piecework. Disregarding quality, many pieces were created to achieve the highest pay possible. This ultimately resulted in the production of unsafe military equipment (The American Society for Quality 1993B). Though piecework pay does not exist, quotas and bonuses act as a motive to produce pieces without regard to quality standards.

Process Organization

- Quality planning, eliminate possibility of defects in planning phase
 - Reduce and eliminate need for defect detection
- Errors found while in production are already too late to completely correct
- Cross-functional teams can address the “Universal Sequence of Events”

Quality planning is a process which encourages full development of production strategies for each product or project required. It fully emphasizes defect prevention and aims to eliminate the need for defect detection (Juran Institute 2007).

It is important to consider the value of proper planning and measure the true impact of changes in production. For example, when a production order is delivered to the production floor, materials have already been ordered, drawings approved by engineering and the customer and the equipment in the plant has been evaluated and deemed capable of completing the required tasks. Most production workers are given instructions from their supervisors and mistakes and defects are not discovered until final assembly, when all of the subcomponents are finally put together. This is because employees are not educated beyond their required knowledge to complete their single task and reliance on correct paperwork is all they have to reference.

The Juran institute has developed what they call the “Universal Sequence of Events” (Juran Institute 2007). The flow follows “Define-Measure-Analyze-Improve-Control” methodology and can be applied to any situation or issue. The first action in the sequence of events is the identification of the organizational issue.

Cross-functional teams can address this as product issues not only concern production but engineers, project management and purchasers, to name a few. Quality teams can be formed to work specifically on such issues. A project can be created with designated responsibilities to ensure the right people are used as resources to provide accurate and reliable information. With achieving customer requirements as the goal, employees are motivated to collectively solve the problem (Hackman & Wageman 1995).

But sometimes, when people are faced with issues in finding the root causes of a problem, the blame game is played. Implementation of process management at such

points will ensure people do stay focused on the real target. Keeping in mind that it is the process under scrutiny and not employees, when ideas are generated they need to be proven as the root cause of the issue. Once the solution is found, proven and implemented, the changes to the process should be documented. New controls should be created, followed by updating the QC associates with the new standards. Keeping the QC associates involved and aware of changes will ensure that new standards are upheld (Juran Institute 2007). Otherwise, an uncoordinated effort will lead to misdirection and is a waste of resources and effort (Hackman & Wageman 1995).

Feedback Loops

- Continually evaluate targets and actual results
- Measure adoptive depth of TQM through organization
- Management must encourage continuous improvement of competitive stance

Within all TQM processes, to measure the success of change, feedback loops must be in place. Measuring customer retention and increases in profit margin cannot be accurately measured, directly or indirectly but some steps can be put into place to keep the employees working towards corporate targets effectively.

Continuous improvement is never finished. Management and employees must ask a few simple recurring questions to ensure teams are effective, processes are being followed through and targets are being met. Ultimately, organizations need to ensure that all

changes made are being continued or find out why they were discontinued and start the problem solving cycle again.

In accordance with common issues and the original targets causing the need for TQM, management should formulate yes/no questions. A publication in American Science Quarterly (Hackman & Wageman 1995) suggested the following questions:

- (1) Are we correctly assessing customer requirements and measuring product performance against the defined requirements continuously?
- (2) Are we choosing suppliers based on quality instead of cost? Do we work with suppliers to improve quality processes through the supply chain?
- (3) Are the cross-functional teams using their resources/each member properly?
- (4) Do we implement statistical process control methods to collect and analyze data? Are appropriate targets being set and hypothesis being tested?
- (5) Is process management invoked to ensure efficient and cohesive team problem solving?

The answers to these questions will clearly demonstrate the depth to which TQM principles have been adopted by the organization. If feedback loops are not kept, managers assume the company is effectively utilizing its resources when actually, management should invoke process management strategies. If this does not occur, the company may not follow the drive of continuous improvement and remain at status quo, instead of advancing and improving its competitive stance.

Supporting Initiatives

Employee empowerment and self motivation are strong factors contributing to the success of TQM, especially its continuous improvement philosophy. Supporting initiatives do exist to assist in problem solving or idea creation. While it is important to consider the specific needs of the company before designing a generic program, learning from others can cut down on time and validate ideas. Listed below are four of numerous tools which can be utilized in implementing TQM and maintaining targets. They have been chosen because they are very different in approach and target different organization factors; this displays the broad nature of TQM to solve problems and strengthen the organization holistically.

1. Just-in-Time (JIT)
2. Kaizen
3. Single Minute Exchange of Die (SMED)
4. Gemba

1. Just-In-Time (JIT)

Just-in-Time is a philosophy which was originally set in place to ensure customer requirements were met in all senses. The product was to be on time, including the right quantity and quality standards. Customer in this scenario refers to both internal and external customers.

At present, JIT refers to reducing production time by eliminating of all forms of waste including communication errors, excess movements, inappropriate tooling. Like other TQM initiatives, JIT will only succeed if all employees are committed to eliminating waste and maximizing efficiency while maintaining quality standards. JIT is a driver of continuous improvement as motivated employees are driven by the challenge of raising the standards (Institute for Manufacturing.200?).

2. Kaizen

Kaizen is a management philosophy used to encourage continuous improvement through small changes at a time. The willingness to change is the key to Kaizen success as it requires the involvement and support of everyone. Control circles and group activities are fundamental to Kaizen as they are used to determine methods of problem solving. The purpose of Kaizen is to encourage change, no matter how small. Value Based Management.Net identified the five foundational elements to the Kaizen method: Teamwork, Personal Discipline, Improved Morale, Quality Circles and Improvement Ideas (Value Based Management.Net. 200?).

3. Single Minute Exchange of Die (SMED)

Single Minute Exchange of Dies method was created to address reductions in changeover time as a method of increasing production efficiency by reducing downtime. The main concept is to reduce changeovers to single minute timing, less than ten minutes, instead

of hours. The method uses the people who complete the changeover to go through the steps and determine what exactly is costing the most time during the changeover and further to suggest methods of reducing the required time. A time goal is set along with tasks to be accomplished and designated responsibilities with deadlines. It is imperative to get everyone's opinion on best practices and even view a few changeovers to see the different approaches to the same task. Post SMED, changeover time should be recorded and compared to the initial time and goal. A follow-up meeting should be held to receive feedback and monitor progress over all shifts and teams (TPF Europe B.V. 2007)

4. Gemba

Known as Gemba Walking, this is a top down approach to learning methods. This method relies on management to initiate walks through the organization. The intention of gemba is to get managers to pass down their TQM knowledge to employees lower on the ladder of hierarchy. The walks involve senior management and an employee involved in TQM initiatives. The ability of the senior management to teach lean philosophy, expect to see it in practice and conduct immediate analysis of progress upon immediate sight of a project is in direct correlation with the success of TQM.

The benefit of gemba walking is to allow the younger employees to view the organization through the eyes of a senior manager. This allows the younger employee to quickly attain knowledge which is the result of years of experience. At the end of the walk the employee is hold much more knowledge of the organization and is greater prepared to apply TQM principles rather than continuing work as usual. Over time, employees can

reflect on the work done and learned skills. This inspires a natural drive to continue setting goals to accomplish greater goals (Mann 2005).

Case Study Example

“Integrating Continuous Improvement and Innovation into a Corporate Culture: A Case Study” by Zahir Irani and John M. Sharp was chosen to be used as an example case, demonstrating the advantages and challenges in implementing TQM.

The case study occurred in the early 1990’s at a small jobbing shop in North West England which was started in 1973. By the 1980’s the company had grown from a part-time shop to over 100 employees and realized that quality was the next market focus. The executives attained the British Standards for Quality from the British Standards Institution and became the first job shop to attain the accreditation. The industry had its usual expansions and recessions but the job shop held a strong business plan which grew and changed dynamically, both strategically and financially to maintain a consistent demand on the shop.

From its conception, the aggressive movement towards keeping ahead of the competition was always apparent at the job shop. The shop mainly produced custom projects, made to order inventory. However, the company owner always believed that an in-house product should be created to ensure ongoing sales of a steady product instead of relying on solely custom jobbing to generate revenue. The owner himself encouraged the documenting and follow-through of ‘best practices’. He believed that investing in people through

training and motivating employees would produce innovative ideas; a radical trend of thought at the time. Because the owner was ahead of the curve in this area, the initial organizational culture was shaped by his vision remained unchanged through the years.

The nature of custom jobbing prevents the company from carrying standardized parts. Through changes in the market, the shop was forced to keep up with flexible manufacturing technologies, employee training and the drive to stay competitive. Continuous improvement kept the company competitive through the years. The company kept up to date with the latest technology and continually upgraded the skills of its employees.

Customers required diverse products. Often only one unit of a product was ordered. Understanding the customers' needs and required quality criteria was essential to producing appropriate product and ensuring return business. It was also important to consider industry standards when making a product. For example, some products were required to pass safety standards set by organizations, like the Canadian CSA, before being allowed on equipment.

Lead times were never short enough but, through proper production capacity studies and scheduling, the company would ensure that rush jobs did not disrupt regularly scheduled production. In the early 1990's, a deep recession hurt the customer base of the job shop and long-term orders were being cancelled overnight. The production levels and custom material inventory were impossible to reconcile and manage. With regular production on

time, no late projects, the company was left with downtime on the production floor due to cancelled projects. This was the first time the company had to make an organizational effort towards reductions in cost and wastes to stay afloat.

The job shop was already developing in-house products. The company understood that good management practices would be required to decipher new inventions from the current innovative ideas; not every innovation leads to an invention. The executives found that companies in all industries with greatest revenue are also the companies with the greatest R&D expenditures. Within three months the company had designed, produced and launched a line of golf and other leisure vehicles for a niche market it discovered and targeted. The commitment to employees, team-based problem solving and best practices had paid off.

Ultimately, the job shop grew and prospered in a dynamic and competitive market because its owner and executives encouraged commitment to the customer, continuous improvement, employee empowerment, innovation, efficiency and total quality service. These initiatives improve the everyday environment at the job shop as well as procedures and processes involving vendors and suppliers. The job shop owner and executives attribute their success to two characteristics: individual and organizational. Individually the staff succeeded in their application of TQM philosophy and practices including; having goals and valid measurables, organizational commitment, taking calculated risks, applying covert resistance and employing participative management. The organizational characteristics which encouraged success include: relationship building, the creation of

teams and the effective and efficient use of resources and support. The job shop continues to thrive through the continuous improvement and implementation of advance strategic, tactical and operational strategies.

The owner of the business was never trained in TQM or any specific initiative but intuitively he knew that a successful business would thrive to stay ahead of the competition and creatively encourage innovation to obtain full productivity from all employees. This case study reinforces the practicality of TQM as it is a rational approach to problem solving, applicable to any organization in any industry.

Discussion

Effective implementation of TQM leads to organizational flexibility and diversity. A company that communicates effectively and can change production processes quickly can remain diverse in the marketplace. We are now in a very diverse, global economy and in the coming years, attaining maximum employee performance and retention will be the next challenge.

I believe that through forming teams and promoting participative management company will increase the rate and effectively of TQM implementation. Recent HR studies have shown that new managers are interested in new ideas, changing the old management methods to improve efficiency and effectively; they are focused on results. These managers are willing to explore TQM philosophy and will produce positive results if management encourages their ideas.

Through team building initiatives, employers can reduce their reliance on single persons or departments and incorporate multiple disciplines to solve a problem through cross-functional teams. Initially the teams may not communicate properly as they communicate using departmental jargon however, problem solving together will increase their knowledge of the other departments and give them a sense of greater impact on the organization. These teams can also positively alter corporate culture and dissipate cliques within departments. Teams are also a method of employee empowerment and increase corporate intellectual capital. Organizations should invest in TQM education to

ensure all employees are capable of understanding techniques, completing designated tasks and further improving processes.

Through my own work experience and studying Total Quality Management, I have found that feedback loops are detrimental to monitor depth of TQM implementation and understanding and changes resulting from TQM initiatives. The most important feedback loops include those which measure:

- Cost of TQM implementation
- Cost and timeline of project completion
- Total effect of changes made: successes and failures including incomplete ideas
- Effectiveness of teamwork
- Follow through with SPC and other QC activities

Finally, I do not believe that critics of TQM really exist. The current “critics” are actually contributing to TQM by stating sources of probable conflict and should be addressed as people who can offer constructive criticism. Keeping in mind that teamwork is a foundational support if TQM, not listening to the criticism of team members is counter-productive and reduces team effort. The critical thinkers could be the most effective problem solvers and quality planners.

Conclusion

Total Quality Management is a rational holistic approach to issue resolution throughout every process and communication within an organization. Though it may require initial costs, in the form of training and team development, the costs are negligible when compared to the benefits of TQM implementation. Benefits include customer retention, reduced errors in product and communication, increased profit margin, superior quality product with the same or less resources, improved employee moral and the ability to attain organizational flexibility and diversify strengths to remain a secure competitor in the global market. Ultimately, organizations which implement TQM are taking a positive approach to ensure they remain a strong competitor in the marketplace.

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