19 Implementation Strategies

19.1. Introduction

In this chapter we introduce the implementation processes of robust engineering into the corporate environment and provide complete and detailed strategies behind the process. In it we will also show compatibility and possible enhancements of any other quality program or process that an organization may already have in place. Some organizations absolutely thrive on change and embrace the challenges and opportunities that come with change and diversity. Those organizations will have the foresight and vision to see that the robust engineering implementation strategy can be a guide for them and ultimately, can help them to stay on the cutting edge and ahead of their competition.

19.2. Robust Engineering Implementation

The six critical components for a smooth implementation process for robust engineering are as follows:

1. Management commitment
2. Corporate leader and the corporate team
3. Effective vommunication
4. Education and training

5. Integration strategy

6. Bottom-line performance

It is extremely important that all of these elements be used. Additional favorable components may be present, of course, that complement corporate strengths and/ or enhance and build on less-developed areas of the organization. Companies that face major challenges and have the greatest needs for a working quality process will definitely have the most to gain from robust engineering.

Step 1: Management Commitment

Robust engineering is one of the most powerful tools for making higher-quality products with little or no waste, and making them faster too. However, as with any new quality process, without the full support of managers, the organization will not receive the full benefit of this program. Buy-in from top and middle management is essential. No matter how good or how efficient a program might be, it can be extremely difficult for personnel at the lower end of the organization if management is not committed to supporting it and making it work. It is essential that management fully understand all of the benefits of the process and see that the program is in no way a threat to their position or to their importance to the organization.

Today, any organization is dependent on the quality of its offerings. Management wants everything to be more efficient, faster, cheaper, and of higher quality. However, the only organizations that will achieve competitive status are those willing to invest in a more advanced and efficient methodology to achieve that quality.

When top management is not only supportive, but encouraging, the rest of the organization will follow suit, and momentum will be gained for the process. A negative attitude by the powers that be can cause the breakdown of the program.

Step 2: Corporate Leader and the Corporate Team

Once all levels of management have bought into the idea of implementing robust engineering methodology, it is imperative that someone be chosen to be the driver, the leader of the project. This person should be a manager, highly efficient as a leader, motivated, and able to motivate others. He or she should be someone whom others would be honored to follow. He or she should be dependable and committed to the goals of the program, be firm in delegation, very detail-oriented, and strong on follow-up. Clearly, it is in the best interest of the organization that the corporate leader be highly respected and have knowledge of the work of all departments. He or she must be able to assert authority and have strong project-management skills. In short, you are looking for a "champion." Top management must be certain that they have chosen the right person for the job.

At the start of the process, an open meeting between upper management, middle management, and the chosen corporate leader should take place. At this meeting, a complete understanding must be reached on all of the elements involved, and the tasks must be broken down to be more manageable and less overwhelming. If the methodology is not managed properly, the robust engineering project will not succeed.

The next most significant contributing factor to the success of the robust engineering implementation process is an empowered, multidisciplinary, cross-functional team. Since robust engineering implementation is an engineering

project, it would be very beneficial to place as many engineers as possible on the team. The team must learn all of the methodology possible. The team should consist of representatives from every department and should be a mix of personalities and talents. It is also important to note, at this point, that there should be no cultural or organizational barriers that could cause the system to break down.

Each team member should have a clear understanding of the overall implementation process and of how his or her part contributes to the "big" picture. To this end, members of the team should divide and/or share all the tasks in the implementation according to responsibilities in the organization and personal abilities. Each team member should take full responsibility and be held accountable for his or her part in the process.

Defining the overall goals and the vision for the project will be the responsibility of a strategic planning team, and the project leader should be actively involved with the strategic planning process as well as with the project. It is also the responsibility of each member of the cross-functional team to support, acknowledge, and communicate his or her understanding of the project and its objectives throughout the entire organization. Success of the process requires control, discipline, and some type of benchmarking against competitors as it progresses.

Managing change is difficult in any organization, and under most circumstances, employees have a natural resistance to and feel threatened by change. A project of the magnitude of robust engineering requires extremely effective management of resources and people to assure its success. Remember, however, that anything new requires consistent encouragement and that mistakes and failures should be considered part of the process. The corporate leader must report back to management on the process at each phase. If he or she sees that something is not moving as planned, he or she must work through members of the team or upper management to keep the process moving in the right direction. Often, when a breakdown occurs, it can be linked directly to unclear or ineffective communication.

Step 3: Effective Communication

It is the responsibility of the cross-functional team to find ways to communicate with the entire organization. Every employee should receive the same messages, and the team must make sure that the meaning is clear to everyone. Robust engineering requires the organization to learn a new vocabulary, and it is the responsibility of the team to find interpretations that everyone can understand. The team members should consider what employees might ask about the process and then be prepared to answer those questions in language everyone will understand. Some of the questions that may come up follow:

❑ What is meant by *robustness?*

❑ What is meant by *optimization?*

❑ What is meant by *variability?*

❑ What is the robustness definition of failure?

❑ What is the operational meaning of prevention?

Of course, there are many other terms that must be defined. The task must be approached through well-thought-out, effective communication channels. Employees will react to what they perceive that a message says, so ambiguity must be

avoided, and every base must be covered. The strategic planning team should put the necessary information into written form to help ensure that everyone is hearing and "getting" the same thing. Each cross-functional team member must see to it that his or her department members understand "what was said" as well as "what was meant." Every employee needs to be able to make decisions based on receiving the same information. Even the best of systems will fail if everyone is not pulling in the same direction, so clear, concise, and timely information is crucial.

It is vital to the success of the project that misconceptions and misinformation be dealt with before the process is started.

Step 4: Education and Training

The importance of training and education can never be overstated, especially when new projects or programs are being introduced into an organization. A lack of understanding by even one employee can cause chaos and poor performance. The robust engineering process requires every employee to have an understanding of the entire process and then have a complete understanding of how his or her part in the process contributes to the bottom line. To that end, some training in business terminology and sharing of profit and loss information should be undertaken for every employee. Training also can help to inspire and motivate employees to stretch their potential to achieve more. It is essential to a quality program such as robust engineering that everyone participate fully in all training. Engineers especially need to have a full understanding of the methodology and its potential rewards. But everyone, from top management to the lowest levels of the organization, must commit to focusing on the goals of the project and how they can affect the bottom line. Knowledge adds strength to any organization, and success breeds an environment conducive to happier workers.

Organizations the world over are discovering the value of looking at their organizations to find out what makes them work and what would make them work better. Through the development and use of an internal "expert" they are able to help their people work through changes, embrace diversity, stretch their potential, and optimize their productivity. These internal experts are corporate assets who communicate change throughout an organization and provide accurate information to everyone. Even when quality programs already exist, often the internal experts can work with the cross-functional team to communicate the right information in the right ways. These experts are also extremely efficient and helpful in spreading the goals and the purpose of robust engineering, as well as explaining the quality principles on which the methodology is built.

Step 5: Integration Strategy

Trying to implement robust engineering methods and create an environment where they can be seen as part of everyone's normal work activities is a challenge in itself. Many quality programs are in popular use at this time, and some view robust engineering as just another program. However, such programs as quality function deployment (QFD), Pugh analysis, failure modes and effects analysis (FMEA), test planning, and reliability analysis are much more effective, take less time, and give higher performance with measurable results when combined with robust engineering.

Robust engineering is a brand new approach to engineering thinking. The old way of thinking was "build it, test it, fix it." The robust engineering way is "optimize it, confirm it, verify it." The Robust engineering implementation process has revolutionized the engineering industry, and it is doing away with many of the more

traditional tools and methods. Some companies, in part, have been able to change their perspectives on what constitutes failure and have been able to redefine reliability. With robust engineering, the emphasis is on variability.

When you make a product right in the first place, you don't have to make it again. Using the right materials and the right designs saves time, saves effort, saves waste, and increases profitability.

Step 6: Bottom-Line Performance

When one measures the results of new ways against the results of old ways, it is usually easy to tell which is better. When there are considerable differences, a closer look at the new way is certainly merited. Systems that implement robust engineering come out ahead on the bottom line. The real question is: Would you rather have your engineers spending their days putting out fires, or would you rather have them prevent the fires by finding and preventing the causes? What if you offered incentives to your workers, the ones who actually made it all happen? What if you motivated them by rewarding them for differences in the bottom line? Your employees will feel very important to the organization when they see how they have helped to enhance the bottom line, but they will feel sheer ecstasy when they are able to share in the increased profits.