

12 Requirements For Six Sigma Success

A PROGRAM MUST
BE DESIGNED
AND ADAPTED
TO SUIT EACH
ORGANIZATION'S
NEEDS.

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In the past few years Six Sigma has become one of the most prominent trends in the quality area.

Numerous large and well-known corporations, such as Motorola, General Electric, American Express, Ford Motor Co. and AlliedSignal, have all ambitiously applied the Six Sigma methodology. Because the results have often been extremely good, resulting favorable publicity has stimulated growing interest among other companies.

A serious drawback of the concept's increasing attention is that some companies choose to be trendy and simply follow the herd without questioning, adapting and designing a Six Sigma program to suit their own specific needs.

This focus on methodology has also been seen in previous quality trends in the Western world—for example in quality circles, *kaizen*, ISO 9000 and quality award models. The hoped for results fail to be seen because of flawed application and expectations. A similar future scenario for Six Sigma is possible.

Our experience and research conducted at the Royal Institute of Technology in Stockholm lead us to believe there are 12 requirements for a successful Six Sigma program.

By working systematically and ensuring favorable development of each requirement, it is possible to dramatically improve the chances of a company's Six Sigma activities producing the intended results.

1. Management Commitment and Visible Support

The likelihood of success with Six Sigma requires the activities being run and supported by top management. Without its total commitment, achieving the organizationwide breakthroughs in attitudes Six Sigma requires is extremely difficult.

This top management support has been noticeable in organizations that implemented Six Sigma with great success, such as Motorola and General Electric. It is, therefore, extremely disturbing that in some companies we are beginning to see a tendency for Six Sigma not to be run by top management.

It is obvious top managers in companies that have achieved success with Six Sigma have acted with determination and adopted a highly visible profile in doing so. As a result, improvement activities were given very high priority throughout the organization. Jack Welch of General Electric and Bob Galvin of Motorola are good examples of executives who adopted such a leadership approach.

Another common problem is that the role of middle management in the improvement process is not always clear. Many companies have trouble getting middle level managers who will be directly affected by measures, to be active in the process itself.

In the worst case, this problem can lead to a vigorous resistance to change at this level. Since middle management is normally organized on a functional basis, it may also result in suboptimization of the improvement process.

To achieve genuine success with Six Sigma, it is therefore important for managers at all levels to become involved and be recognized as the problem owners.

Many successful Six Sigma programs are based on efforts to attach status to the different roles within Six Sigma and make them an important phase in individual careers.

Salary increments and possible bonus systems should be closely linked to the company's Six Sigma program.

General Electric, for example, makes it clear there will be no promotions without active participation in Six Sigma activities, while Volvo refers to its Black Belts (BBs) as future leaders. This is a powerful incentive to individuals to give priority to and become involved in improvement programs.

2. Treatment of Six Sigma as a Holistic Concept

The idea behind Six Sigma is to introduce an efficient infrastructure on which to base improvements.

All roles have to be well-defined and effective if the desired results are to be achieved.

It is particularly important that the development of Champions, BBs and Green Belts (GBs) be coordinated. These are the roles that make up the project organization for problem solving on which Six Sigma is based.

Experience tells us improvement activities should be carried out in project form. A project group consisting of the employees who will be affected by the improvement is set up for each chosen improvement area. This generates a sense of involvement that facilitates the implementation of changes while guaranteeing the maximum knowledge of the situation and problem.

Making the improvements in project form also increases the ability to cover cross-functional problem areas, while the Six Sigma methodology adds to the efficiency of the improvement activities. Six Sigma project members are normally referred to as GBs and White Belts and are often under the leadership of BBs.

Besides the actual project groups, working in project form requires a backup organization. This organization consists of the responsible management and a supporting specialist.

The idea is that the managers of the business should be recognized as problem owners and thus as the client for the improvement projects. Furthermore, as these managers are also resource owners, they are able to allocate time for the employees to take part in the improvement project. In Six Sigma, Champions usually fill this responsible management role.

The supporting specialist role consists of quality organization and improvement specialists. Their task is to identify areas for improvement, prepare the relevant background data, support project initiation, provide training in improvement techniques, provide competence support for

12 KEY REQUIREMENTS FOR SIX SIGMA SUCCESS

1. Management commitment and visible support.
2. Treatment of Six Sigma as a holistic concept.
3. Investment of adequate resources.
4. Focus on results.
5. Customer orientation.
6. Focus on training and its content.
7. Adaptation to an organization's situation and needs.
8. Prioritization and selection of projects.
9. Development of uniform language and terminology.
10. Development of strategy to introduce Six Sigma.
11. Follow-up and communication of success stories.
12. Responsiveness to external influences.

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problem solving, coordinate activities and compile results and experiences.

Sometimes improvement specialists also serve as project managers in improvement projects. In Six Sigma, these roles are filled by Master Black Belts (MBBs), BBs and, to some extent, GBs.

In the ongoing discussion of Six Sigma, particularly at companies that have implemented it, there is far too much focus on the role of BBs. This includes talk about the content of BB training and the number of trained BBs. If the other roles are neglected this can, at worst, lead to a system that has little chance of being effective. This, in turn, means high expectations often may not be fulfilled.

The primary focus instead should be on the role of management. It is important for top management's competence to be developed before that of other employees.¹ This improves management's ability to actively support other development activities and provides the necessary confidence that comes from having Six Sigma proficiency.

Should the role of management become secondary, the consequences are serious because management is the resource owner. The lack of management involvement can easily make the active improvement measures ineffectual.

3. Investment of Adequate Resources

In many companies Six Sigma programs have resulted in considerable financial benefits. Motorola, for example, generated savings of \$15 billion in an 11-year period,² and General Electric saved \$2 billion in 1999.³ Our experience is that many companies have saved an average of \$100,000 to \$200,000 per implemented improvement project. The return on the investments made has often been very good, in many cases more than five to 10 times the original investment.

It is, however, important to note the companies that have produced good results have invested adequate resources, provided extensive training programs and involved many individuals in their Six Sigma programs.

Normally, the number of full-time, employed BBs represents 1 to 3% of the total number of employees. Even back in 1992, Motorola invested \$150 million

per year in Six Sigma courses,⁴ and in 1999, General Electric invested \$500 million in improvement programs.⁵ One implication of this is that time and other resources must be systematically dedicated to Six Sigma for it to have the desired result.

Claims of not being able to afford to allocate resources are easily refuted. If you look closer at the cost of poor quality in a company, you can often easily see them amount to around 20 to 30% of a company's revenues, disregarding the fact that many quality failures such as customer dissatisfaction and loss of market share cannot be quantified.⁶

Any claims by a company that improvement programs cost too much should therefore be interpreted as the result of ignorance and shortsightedness.

4. Focus on Results

It is extremely important for Six Sigma activities to primarily focus on achieving results. The tools and methodologies required to get results are merely aids for the improvement activities, which can vary from situation to situation.

Another threat to Six Sigma success therefore comes from the frequently exaggerated focus on the methodologies and tools included in Six Sigma training courses.

To arrive at sound solutions, this knowledge of tools and methodologies is naturally important, but the tendency is often for them to become ends in themselves—a common phenomenon in the past with other quality initiatives. There are also indications it has become a matter of prestige for Six Sigma courses to include very advanced statistical tools and methodologies.

Broadly based in-house training in advanced statistical methodologies may be important as a means of providing the skills needed to solve complex problems, but there is a significant risk this will be at the expense of other competencies.

This fact is particularly serious since most Six Sigma training programs are of roughly the same duration. BB training generally lasts for four weeks, so course components will be a compromise among different, necessary areas of expertise.

An important aspect of Six Sigma's focus on results is to set challenging improvement goals. The concept

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emphasizes these should be based on facts that have been gathered and analyzed systematically. Challenging goals are needed for the overall improvement work and for individual improvement projects. It is important that these goals be explained and clarified for the entire organization, with regular refreshers.

5. Customer Orientation

There is a serious risk of Six Sigma programs becoming too inward looking. The programs are heavily geared toward internal variations, the focus is usually on production, and the Six Sigma training often gives lower priority to customer orientation.

In this situation, the Six Sigma activities can become suboptimized and lead mainly to internal cost cutting, while customers and the potential to increase revenues are ignored.

If a Six Sigma program is to have the maximum effect, improvement activities need to be given a distinct customer focus. This means the selection of Six Sigma projects must, to a considerable extent, be based on what customer benefit is attainable.

It is therefore important to develop the knowledge of customer needs and behavior and evaluate completed projects from the perspective of the customer. Management must focus closely on this customer orientation.

6. Focus on Training and Content

A distinct advantage of Six Sigma is that more resources are devoted to competence development and training than with most previously used improvement concepts. This increases the chances of success.

But how the training programs are planned and carried out is very important. Most Six Sigma training courses combine theoretical instruction with practical applications. This often improves learning and skill development dramatically.

The competencies included in many Six Sigma training programs, however, are often far too one-sided, and many important areas are overlooked. The main focus is usually on statistical problem solving

methods, while the focus on project management, behavioral techniques and customer orientation is often weak. It is these latter skills that determine how successful an improvement project will be.

Success also depends on developing a training program adapted to the particular needs and circumstances of the individual company.

We have doubts about whether knowledge of some of the more sophisticated analytical tools needs to be spread throughout organizations. A better arrangement could possibly be to have a few experts who have mastered the more advanced methods and who can, when necessary, support the analyses being made by the BBs and GBs.

7. Adaptation to an Organization's Situation and Needs

A common belief seems to be that Six Sigma must have a certain common structure, include certain fixed tools and procedures and focus on a certain type of problem. Such a standardized approach can lead to a nonoptimized program.

The adaptation of the program to an organization has to be based on a number of parameters including the nature of the business, products, customer relations and competition.

Relevant conditions such as the employees' level of training, attitudes and working climate, as well as the company's financial situation and management's commitment and knowledge will also help determine the design of a Six Sigma program. Even factors like country and culture can be important.

Another key adaptation should be to the size of the company. Many of the companies whose Six Sigma activities have received attention are relatively large. This means most of the programs, tools and methods they employ have mainly been developed to suit large businesses. It can sometimes be difficult to apply such an approach in small companies, so specific Six Sigma programs should be developed for them.

Many aspects of a product's quality are grounded in the supplier stage, particularly as more and more companies prefer to focus on their core business, often relying on outsourcing in other areas. Developing Six

Sigma programs for small companies could help large companies when they encourage or demand that their often relatively small suppliers use Six Sigma.

8. Prioritization and Selection of Projects

Once a business and its processes have been evaluated or analyzed to identify areas with improvement opportunities and shortcomings, a wide range of possible improvement projects will normally emerge. The prioritization and selection of projects to be worked on is vital to the success of the Six Sigma program.

Operational managers—the problem owners—should make these decisions. This provides ability for freeing necessary resources and giving the right priority to the problem solving process.

Improvement projects can be selected in a variety of ways. First, distinguish between the result focused and tactical rankings of priorities. The former ranking is intended primarily to have the maximum effect—the highest possible return on the resources invested in improvements. Tactical ranking, on the other hand, focuses on adaptation to the existing situation to achieve other benefits, such as guaranteed successes.

The result focused ranking of priorities is usually based on the use of the Pareto principle. In other words, the objective is to identify the few vital areas that are the cause of the greatest part of the problems.

Other important factors that influence result focused ranking include profit potential, market and customer impact, efficiency gains and time savings. Theoretically, this means the Six Sigma process will be highly efficient; in reality, other factors of great importance also come into play.

The tactical ranking of priorities is often a necessary complement, especially when a nonmature organization launches an improvement program such as Six Sigma. Here, the selection of a project is determined by such factors as the employees' opinions and interest in the changes, the problem solving competency of the individuals concerned, attitudes towards change, the ability to achieve results quickly, the difficulty of the solution and the sustainability of the results.

We have had positive experiences when focusing systematically on areas of a business that are not part of production. Favorable results can often be achieved rather quickly from support functions such as administration because these areas have traditionally not been exposed to the same pressure to improve as has production.

By focusing strongly on the early stages in all processes, many problems and shortcomings that would otherwise have proved extremely costly can be prevented.

9. Development of Uniform Language and Terminology

It is important to develop a uniform language and terminology both internally and externally.

To date, the dominating terminology for Six Sigma has been that of Motorola. There is a risk this might deter some organizations, such as those in the public sector, from initiating Six Sigma programs. It might therefore be better to agree on a neutral yet precise terminology.

What is more serious, however, is that companies assign different responsibilities and tasks to the same Six Sigma role. This reduces the scope for learning from each other and means misunderstandings can easily arise.

It is also important to ask which role structure is most effective and look critically at what responsibility and authority should be given to the different people involved.

A related problem is many companies use foreign language training material and foreign instructors and consultants. Linguistic and cultural differences can cause misunderstandings and problems.

10. Development of a Strategy To Introduce Six Sigma

To increase the chances of implementing Six Sigma successfully, a well-thought-out introduction plan should be developed. Top management must be totally committed to the quick achievement of good results that demonstrate what the program can accomplish.

When working with organizations, we use a four-phase implementation methodology: introduction, trial, implementation and continuation.

The **introduction** phase involves outside specialists training top management and other key individuals by explaining and clarifying the concept's implications. This provides the competence and understanding needed to enable management to introduce Six Sigma successfully later.

This is followed by a **trial** phase, in which a small number of improvement specialists are given a crash course with the aid of outside instructors. The specialists then carry out a few, select improvement projects with external guidance.

The results of these pilot projects are evaluated carefully so they can serve as the basis of a Six Sigma

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program well adapted to the needs and the situation of the company.

Once the company has reached sufficient maturity, **implementation** starts. This involves launching the Six Sigma program throughout the entire business. Once this has been accomplished, the process moves on to the **continuation** phase, in which the concept is continuously maintained and improved. Six Sigma has then become a part of the company's internal culture.

11. Follow-up and Communication of Success Stories

A decisive success factor, often neglected by many companies in the past, is the careful follow-up and verification of the results of completed projects.

Follow-up should be from three perspectives: goals, methodology and return. Follow-up of the project goals means verification of the intended result has been achieved, which is also an important part of project management.

By far the most important follow-up is to determine the financial return generated by the improvements because this information will become a critical factor driving the entire Six Sigma program.

Apart from follow-up of the financial return, implemented improvements should also be followed up from the perspective of customer and employee impact. These nonmonetary effects are also extremely important because they help emphasize the customer focus of Six Sigma programs and create important incentives for the employees.

The follow-up of methodology involves acquiring valuable skills that can be applied to future improvement projects.

It is also important the results obtained be communicated internally and externally to customers and the market. This helps highlight models for success and generates the impetus for continued and extended improvement activities.

The responsibility and competency for deciding how this information should be incorporated into internal and external marketing needs to be established. Companies like General Electric and Motorola have done this successfully—probably one of the main reasons Six Sigma has spread so rapidly.

12. Responsiveness to External Influences

A common Six Sigma strategy is to ensure long-term self-sufficiency within the company when it comes to training for the different Six Sigma roles. This is important because of the great amount of training needed and because certain roles (mainly the BBs) are designed to have a high turnover rate.

Many companies have a policy that individuals should put about two years in the BB role as part of their career development and then be replaced by other individuals. The MBBs therefore act as instructors for novice BBs.

This system means lessons learned are passed on to the next generation of BBs but involves the risk of a kind of inbreeding in which the company bases its improvement programs solely on knowledge and skills generated and developed internally.

A successful Six Sigma program should therefore be combined with the active pursuit of new ideas from outside the company. External training courses, benchmarking and collaboration with researchers and consultants are crucial for ensuring companies that use Six Sigma are able to maintain cutting edge competency in the improvement area.

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