MANTECH Publications

Journal of Product Design, Quality Engineering & Technology
Volume 2, Issue 1, January-April 2017

Six Sigma Review

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Abstract

When you can identify and quantify hidden process defects, you can eliminate them and move those wasted dollars to the bottom line and to investment in new opportunities to grow your business. By knowing which factors affect your process outputs and cause problems, you can take the steps to improve them. Gaining and using that knowledge is the goal of Six Sigma. Like peeling an onion, Six Sigma uncovers the layers of process variables and defects that you need to understand and control to eliminate the wasted time, effort, and materials that add to your costs but don't add value for your customers.

It's a problem-solving technology, but it's also a management methodology that ties process improvement directly to lowered costs, improved customer satisfaction, and higher returns on your investment of time and money in your business. Six Sigma is far more than a "quality" fad. The proof Hundreds of companies are implementing Six Sigma as you are reading this book. They are lowering their costs, improving customer satisfaction, and increasing their profit. In other words, they are getting great results. Now you can as well! ain a high-level understanding of the tools methods and application of Six Sigma Learn the basic vocabulary of Six Sigma Understand the roles and responsibilities of Six Sigma practitioners. Identify the benefits of Six Sigma as a business improvement methodology.

Keywords: *Six sigma*

INTRODUCTION

What is Six Sigma? To put it very simply, Six Sigma is a problem-solving methodology that reduces costs and improves customer satisfaction by greatly reducing waste in all the processes involved in the creation and delivery of your products and/or services. **See figure 1.**

Sigma (σ) is a letter in the Greek alphabet that has become the statistical symbol and metric of process variation. The Sigma scale of measure is perfectly correlated to such characteristics as defects-per-unit, parts-per-million defectives, and the probability of a failure. Six is the number of sigma measured in a process, when the variation around the target is such that only 3.4 outputs out of one million are defects under the assumption that the process average may drift over the long term by as much as 1.5 standard deviations. Six Sigma may be defined in several ways. Tomkins (1997)

Defines Six Sigma to be "a program aimed at the near-elimination of defects from every product, process and transaction." Harry (1998) defines Six Sigma to be "a strategic initiative to boost profitability, increase market share and improve customer satisfaction through statistical tools that can lead to breakthrough quantum gains in quality."

Figure 1

Six Sigma was launched by Motorola in 1987. It was the result of a series of changes in the quality area starting in the late 1970s, with ambitious ten-fold

improvement drives. The top-level management along with CEO Robert Galvin developed a concept called Six Sigma. After some internal pilot implementations, Galvin, in 1987, formulated the goal of "Achieving Six-Sigma capability by 1992" in a memo to all Motorola employees (Bhote, 1989). The results in terms of reduction in process variation were on-track and cost savings totaled US$13 billion and improvement in labor productivity achieved 204% increase over the period 1987–1997 (Losianowycz, 1999). In the wake of successes at Motorola, some leading electronic companies such as IBM, DEC, and Texas Instruments launched Six Sigma initiatives in early 1990s. However, it was 1 not until 1995 when GE and Allied Signal launched Six Sigma as strategic initiatives that a rapid dissemination took place in non-electronic industries all over the world (Hendricks and Kelbaugh, 1998). In early 1997, the Samsung and LG Groups in Korea began to introduce Six Sigma within their companies. The results were amazingly good in those companies. For instance, Samsung SDI, which is a company under the Samsung Group, reported that the cost savings by Six Sigma projects totaled US$150 million (Samsung SDI, 2000a). At the Present time, the number of large companies applying Six Sigma in Korea is growing exponentially, with a strong vertical deployment into many small- and medium-size enterprises as well. As a result of consulting experiences with Six Sigma in Korea, the author (Park et. al., 1999) believes that Six Sigma is a "new strategic paradigm of management innovation for company survival in this 21st century, which implies three things: statistical measurement, management strategy and quality culture." It tells us how good our products, services and processes really are through statistical measurement of quality level. It is a new management strategy under leadership of top-level management to create quality innovation and total customer satisfaction. It is also a quality culture. It provides a means of doing things right the first time and to work smarter by using data information. It also provides an atmosphere for solving many CTQ (critical-to-quality) problems through team efforts. CTQ could be a critical process/product result characteristic to quality or a critical reason to quality characteristic. The former is termed as CTQy, and the latter CTQx.

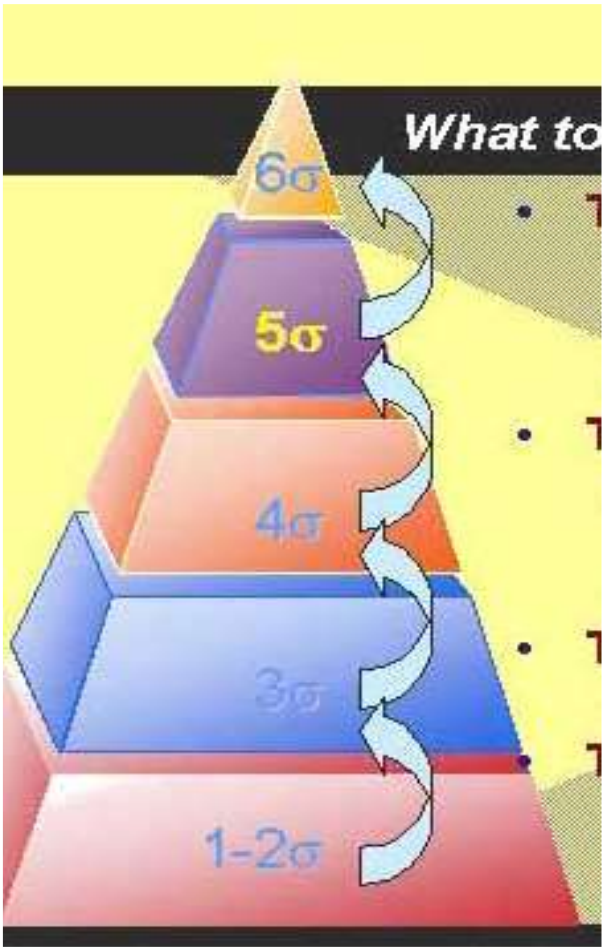

Figure 1.1 Typical view of camshaft

II. DEFINING SIX SIGMA AND STARTING ON THE PATH

FollJack Welch, former CEO of GE, credits Six Sigma With increasing the gap between GE and any close competitor. I was there and knew Jack Welch was a self-proclaimed cynic when it came to quality type programs, but this is what he said about Six Sigma: "I describe Six Sigma as the most important initiative GE has ever undertaken" Just as Six Sigma invigorated GE, it can do the same for your organization. It is a myth that Six Sigma only works for large companies. GE treated its business as many small business units integrated together. In this book I will share the technology of Six Sigma and teach you how to apply it to your business. I will break down the elements of Six Sigma and put them into simple terms so that you can directly implement this methodology in your everyday business processes, immediately. Even if you've never taken a business course, you will be able to utilize the concepts, terminology, and methods

presented in this book to achieve Six Sigma success. The Six Sigma journey begins with an understanding of some of its most basic components. Vital few The "vital few" is a recurring concept in Six Sigma. In this context, it refers to the main actions or events in a process that cause problems. By dealing with these vital few causes, we can often dramatically reduce problems. Six Sigma helps us identify the vital few and then provides a step by- step methodology for process improvement.

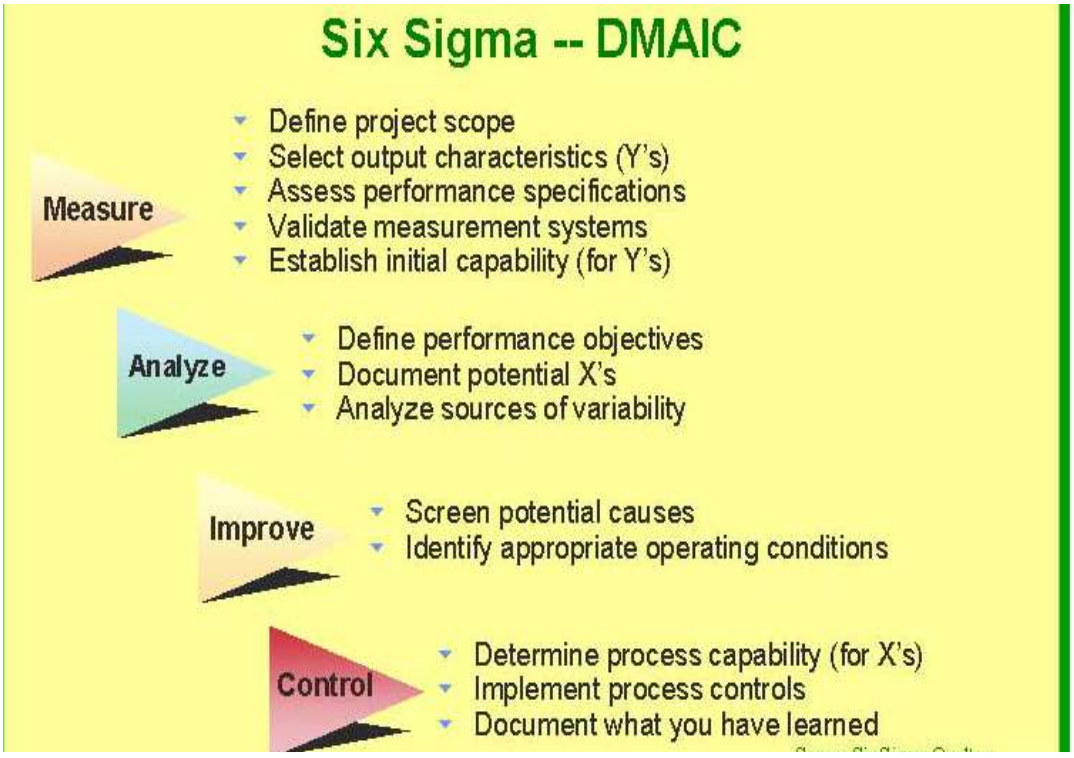

Figure 2.2 Chemical composition of Grey cast iron camshaft graph

THE BASIC COMPONENTS OF SIX SIGMA

There are three basic concepts that are common to all businesses that Six Sigma addresses: processes, defects, and variation. You may not have used these terms before, but let's look at each one.

Process

A fundamental concept of Six Sigma is process. A process is any set of Repetitive steps—in any manufacturing, services, or transactional environment to achieve some result. There are processes for all of your core business activities and functions. They are the steps that the people in your

organization go through to do their jobs and deliver your products or services.

You may not have thought much about them, but they're there nevertheless. Understanding them and making them work at the highest level possible is the goal of Six Sigma.

Defects

Part of the Six Sigma methodology includes measuring a process in terms of defects. Six Sigma helps you eliminate those defects so you can consistently and profitably produce and deliver products or services that meet and exceed your customers' expectations. It's not unusual for a small business to have a minimum of 10 percent of its net income being wasted by process defects. In other words, those defects are dollars wasted! Here are typical defects we have all experienced:

- Scheduling defect at doctor's office
- Waiting in line at drive-through (wrong food, too much time)

Defect

A measurable characteristic of the process or its output that is not within acceptable customer limits, in other words, not conforming to specifications. The sigma level of a process is calculated in terms of the number of defects in ratio to the number of opportunities for defects.

Examples

- Getting someone else's dry cleaning order
- Waiting for more than five minutes in the fast food drive through line
- Shipping damage
- Incorrect invoices
- Missed deadlines

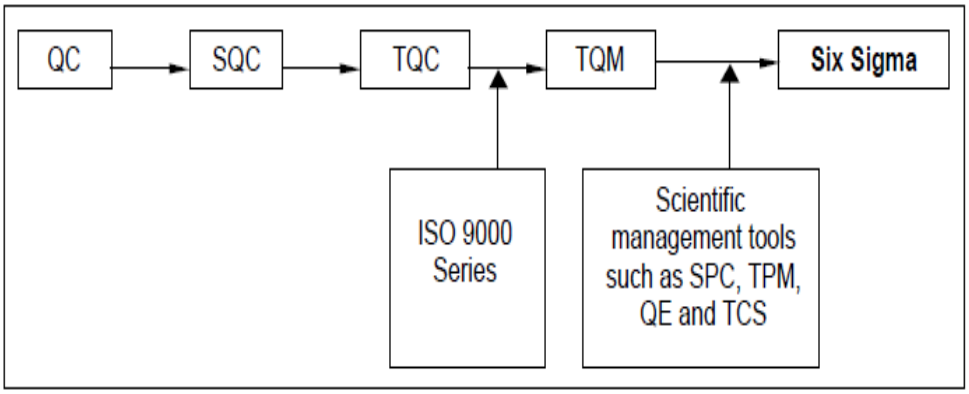

Figure 1.2 Development process of Six Sigma in quality management

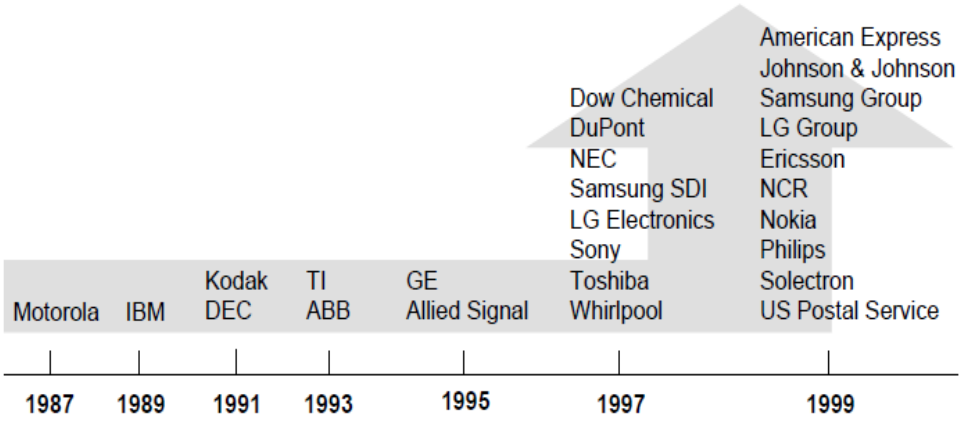

Figure 1.3 Globally well known Six Sigma companies

The list can go on for the remainder of this book, but the point here is that these are everyday life defects, and businesses have defect lists just as long and, in some cases, interact with your personal defect list.

Variation

The Six Sigma methodology reduces variations in business processes. It seems obvious, but you can't consistently produce a high quality product or service (your output) if you have variations in your processes, right? Basically, you have achieved six sigma when your processes deliver only 3.4 defects per million opportunities (DPMO). For example, this would mean that out of one million bags checked in at the airport luggage counter, only 3.4 would be lost. In other words, your processes are working almost perfectly. Of course, this is very difficult to do, but you can begin to approach it (or at least get a lot better) by implementing the methods described in this book. The fact is that most businesses operate at three to four sigma quality levels, which translates to about 25 percent of their revenue lost to defects in their processes. Those defects represent waste, rework, higher costs, and dissatisfied customers. At what level of quality level does your business operate? Wouldn't you like to do better? Of course you would! That's what this book is all about. Now that you have a preliminary understanding of the basic concepts of Six Sigma, you may be asking "Can Six Sigma really work for a small business?" The answer is, Six Sigma can be implemented in any business, regardless of what you do or how small you are. Six Sigma is about problem-solving, and problems are everywhere. It doesn't matter what type or size of business this breakthrough methodology is applied to. You might be a wholesaler, a retailer, a manufacturer, or a service

organization. You might have three employees, or maybe you have 300. No matter, Six Sigma will work for you.

COMMON MYTHS ABOUT SIX SIGMA

Over the years I have talked to hundreds of business leaders, and I could not possibly count or include here the number of misconceptions I have heard about Six Sigma. However, here are some of the most common myths about Six Sigma:

- It applies only to large companies.
- It only works in manufacturing settings. Although it's true that Six Sigma started in manufacturing, it has been applied successfully in all segments of business—banking, healthcare, the military, fast-food chains, airlines, hotels, retail stores, and on and on and on. If there's a repetitive process with a problem, you can apply Six Sigma!
- You must hire an outside consultant.
- You need experts (i.e., "Black Belts"), to make it work.
- Six Sigma is a complicated, statistical methodology that the ordinary person is incapable of understanding.
- Six Sigma doesn't include customer requirements. That's totally false. Every Six Sigma project starts with the customers, with determining the factors that are critical to the customer. Those factors Six Sigma is repackaged Total Quality Management. Quality programs are valuable in that they can create a quality perspective and culture. But Six Sigma fixes identifiable, chronic problems that directly impact your bottom line. Six Sigma projects are selected to reduce or eliminate waste, which translates into lower costs, happier customers and real money for the bottom line. Six Sigma is not theory. It defines measures, analyzes, improves, and controls the vital few processes that matter most, to tie quality improvement directly to bottom-line results.
- Six Sigma is an accounting game without real savings.
- Six Sigma is just training.
- Six Sigma is a "magic pill" to fix problems with little effort.

If you feel intimidated by the idea of adopting the Six Sigma Methodology or you are in any way unsure of your ability to succeed at it, I can assure you that you're not alone. Every business leader I have ever worked with has felt the same way you do at the beginning. But once you understand and recognize what Six Sigma can achieve for your organization, it's easy to embrace it with enthusiasm. Let's address some of the concerns You might have and get them out of the way—they are roadblocks on your journey to Six Sigma success.

COMMON CONCERNS ABOUT IMPLEMENTING SIX SIGMA ADVANTAGES

Six Sigma Will Help You to:

- Identify hidden waste and costs
- Identify and eliminate defects
- Increase profit margins
- Increase customer satisfaction
- Increase your employees' satisfaction and level of commitment
- Grow and expand your business

Let's briefly elaborate on these benefits.

1. Identify hidden waste and costs: On a personal level, if I ask you to give me the last two years of your check register, do you think I could find some waste? And are there hidden or natural spending patterns that don't need to exist?

2. Identify and eliminate defects: In your business do you ever have to spend effort and money on FedEx sending things overnight that should not have to be FedEx-end due mainly to your poor planning or some other related defect caused by your internal process?

3. Increase profit margins: How can you increase profit in your business? There are typically two ways: 1) increase the price of the services or product you are selling, or 2) decrease the cost of goods/services. This means you either need a differentiator to increase your price or to decrease the cost of goods and services you must identify and fix the defects that raise your costs.

4. Increase customer satisfaction: For the small business owner, this benefit should probably be at the top of this list. After all, your main function is to make your customers happy and keep them wanting to do business with you. Companies exist for one purpose: to profitably serve

customers. So it follows that any problem-solving initiative should help you do that. (See sidebar on next page for more on this.)

5. Increase your employees' satisfaction and level of commitment: Your people and you can enjoy solving a problem that costs you time and money. Employees feel like owners when they have the tools and are allowed to fix costly problems in the business. It provides a great sense of accomplishment for everyone.

Grow and expand your business:

"Growth," like any other problem, is a problem to solve. So what are the market factors to grow and expand? Is your business ignoring a distribution channel, or perhaps the Internet is not being used effectively. What are the most important factors for growth? What is your growth objective for this year? Six Sigma is about asking new questions and then systematically finding answers.

I want you to stop here for a minute and think about your business. After all, this book is about how Six Sigma can benefit you. The following exercise is designed to help you become more familiar with how your business operates and the problems you may be experiencing. It will also get you into the Six Sigma mode of thinking.

FINDING YOUR AREAS OF IMPROVEMENT

The following exercise will help get you thinking about areas you can improve in your business.

1) Six Sigma is a problem-solving methodology. List four problems your business is experiencing right now.

2) Now think about the day-to-day operations of your organization. List four of your major repetitive processes.

3) Next, think about the defects affecting your product(s) or service or outputs. What four defects do you see on a regular basis? List them below.

4) Finally, what variations do you see in your business processes?
   Variations, for example, might include differences in the way you do things from day to day or in your outputs. List the four major variations below.

Now you're starting to get the concepts, and this is the initial list for targeting areas of improvement and identifying the business problems that can keep you up at night. Keep this list handy, as we will use it in the coming chapters to start problem solving

CONCLUSION

Six sigma objectives

- You want to turn your current mistakes into profit. (Note: you can't turn mistakes into dollars. You can however, get rid of mistakes And realize lower costs and improved performance and profitability as a result.)
- You want more time for a personal life.
- Your business is doing well, but you know it could do much, much better.
- You want to increase profit.
- You want to make a better product/service at lower cost with less waste and rework.
- You want to deliver higher quality services and products to your customers.
- You want to increase the satisfaction of your customers.
- You want to grow and expand your business.
- You want to maximize your employees' contribution and increase their level of commitment.

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