

Six Sigma and Organizational Goals

Six Sigma Foundations and Principles



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Session Overview

- Recognize why organizations use Six Sigma
- Discuss how the philosophy is applied
- The evolution of Six Sigma from Quality

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What is Six Sigma?

- Six Sigma is a set of management techniques intended to improve business processes by greatly reducing the likelihood that an error or defect will occur.
- Organizations apply Six Sigma tools and techniques through:
 - Structured improvement projects using Six Sigma roadmaps (DMAIC, DMADV, etc.)
 - Using Six Sigma tools and analytical approaches in their daily work (continual improvement)

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Applying Six Sigma Philosophy and Goals

- A Six Sigma *deployment* is the implementation and use of Six Sigma methods at all levels of an organization – the organization uses these approaches as the primary means to drive improvement
- The most successful deployments recognize:
 - The participation and education must involve everyone
 - It is a long term (permanent) culture shift in the way problems are solved
 - The roles and responsibilities have to be integrated into all existing job descriptions
 - It requires effort and discipline to maintain

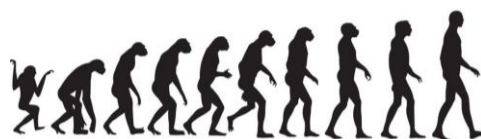
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Factors that Lead to Failure

- Lack of commitment to real process improvement – efforts to implement actual change stall
- Six Sigma is not meaningfully integrated as a way to achieve business goals
- Lack of a structure to continue the program once engagements with outside consultants are complete
- Training too many people, too fast
- Only doing one project per person



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Definitions of Six Sigma

- The phrase “Six Sigma” has a few accepted definitions, depending on context:
 - **Six Sigma Philosophy** – the perspective that all work processes can be defined, measured, analyzed, improved, and controlled. Process inputs (x’s) can be improved and controlled to realize an improvement in the process outputs (Y). This relationship is expressed as $Y = f(x)$
 - **Six Sigma Tools** – A toolset of qualitative and quantitative approaches that Six Sigma practitioners and teams use to drive process improvement.
 - **Six Sigma Methodology** – The use of a prescriptive and structured approach to process improvement. The most widely adopted and recognized approach is the DMAIC problem solving approach.
 - **Six Sigma Performance** - A process that has reduced variability to the point of achieving fewer than 3.4 defects (or errors) per million opportunities.

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The DMAIC Methodology

DMAIC is the primary problem-solving methodology used in the Six Sigma approach, its steps are as follows:

- **DEFINE** the problem or issue to be worked on. Why is it important to the customer?
- **MEASURE** the problem to quantify the current impact.
- **ANALYZE** the process to determine what is causing the problem.
- **IMPROVE** the process. Implement changes resolve the identified and prioritized root causes
- **CONTROL** process inputs and monitor the system so the problem doesn't reoccur

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Success factors of DMAIC

- Utilizing the tools contained within each step of the DMAIC process as they are sequenced.
- Members of the team represent all areas of the process. This is often a cross functional team and/or a cross departmental team
- Each phase must be completed and approved before moving to the next.
- The organization must provide the time and resources needed to adequately complete the phases
- Senior Management must receive the necessary training to understand their role in being committed to the DMAIC approach and the Six Sigma organizational approach

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The Evolution of Six Sigma from Quality

- Concepts of quality improvement and waste reduction has been in the minds of people for centuries
- Setting work standards has been around for more than a century and was the foundation of guilds and crafts trades dating back as early as the 1400s
- From the mid-1800s to the early 1900s, separation of work was developed with the goal of speeding up production processes
- In the early 1900s, Frederic Taylor and Henry Ford developed ideas and techniques that are still in practice today

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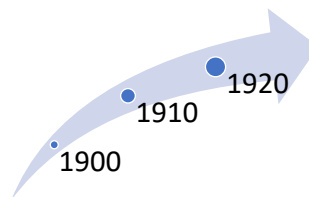


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Frederic Taylor

Frederic Taylor, an American mechanical engineer, wrote the book, *The Principles of Scientific Management*. These principles consisted of:

1. Replace rule-of-thumb work methods with methods based on a scientific study of the tasks.
2. Scientifically select, train, and develop each employee rather than passively leaving them to train themselves.
3. Provide detailed instruction and supervision of each worker in the performance of that worker's discrete task
4. Divide work nearly equally between managers and workers, so that the managers apply scientific management principles to planning the work and the workers actually perform the tasks.



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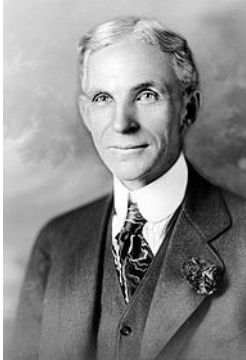
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Henry Ford

Henry Ford, founder of the Ford Motor Company introduced numerous advances in automobile manufacturing:

- Intense commitment to lowering costs
- A standardized distribution system of dealerships
- Mass production of goods organized in an assembly line
- High wages to attract the best talent
- Introduction of the standardized 8-hour, 5-day workweek



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Walter Shewhart

Given these new methods, the Quality Control/Quality Assurance Specialist roles were created to monitor adherence to established standards

This separation of tasks resulted in an evolving view that the Quality Function was the one responsible for satisfying the customer expectations, and not the people performing the work

In the 1920s, Walter Shewhart created a technique to monitor process performance using graphs to understand if the process was behaving in a predictable way. This technique became known as Quality Control Charts



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Kaoru Ishikawa

Company Wide Quality Control (CWQC) was introduced in the 1960s by Kaoru Ishikawa demonstrating that quality is applicable to the entire organization, not just products

Quality Circles were introduced in Japan in the late 1970s and were comprised of small groups of employees who discussed issues and collaborated to implement solutions

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The Evolution of Six Sigma from Quality

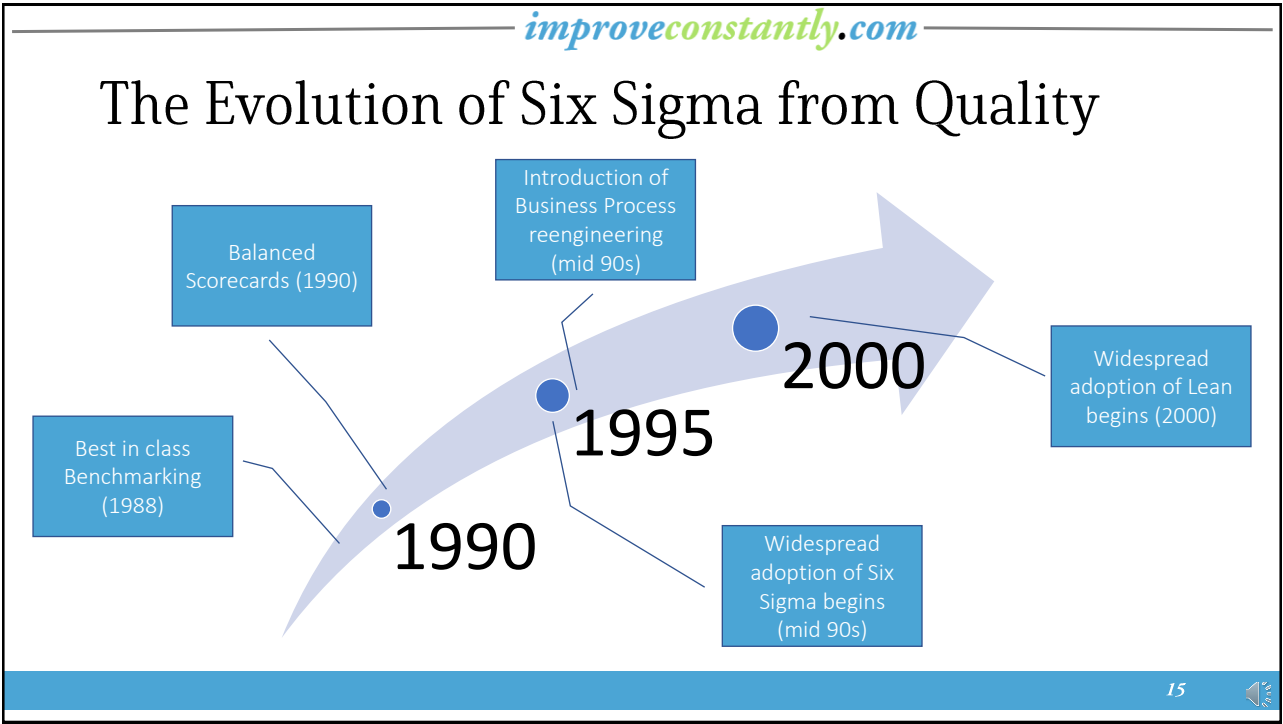
1980: Total Quality Management & success through customer satisfaction

1985: Evolution of Shewhart's Quality Control Charts to "Statistical Quality Control" (mid-1980s)

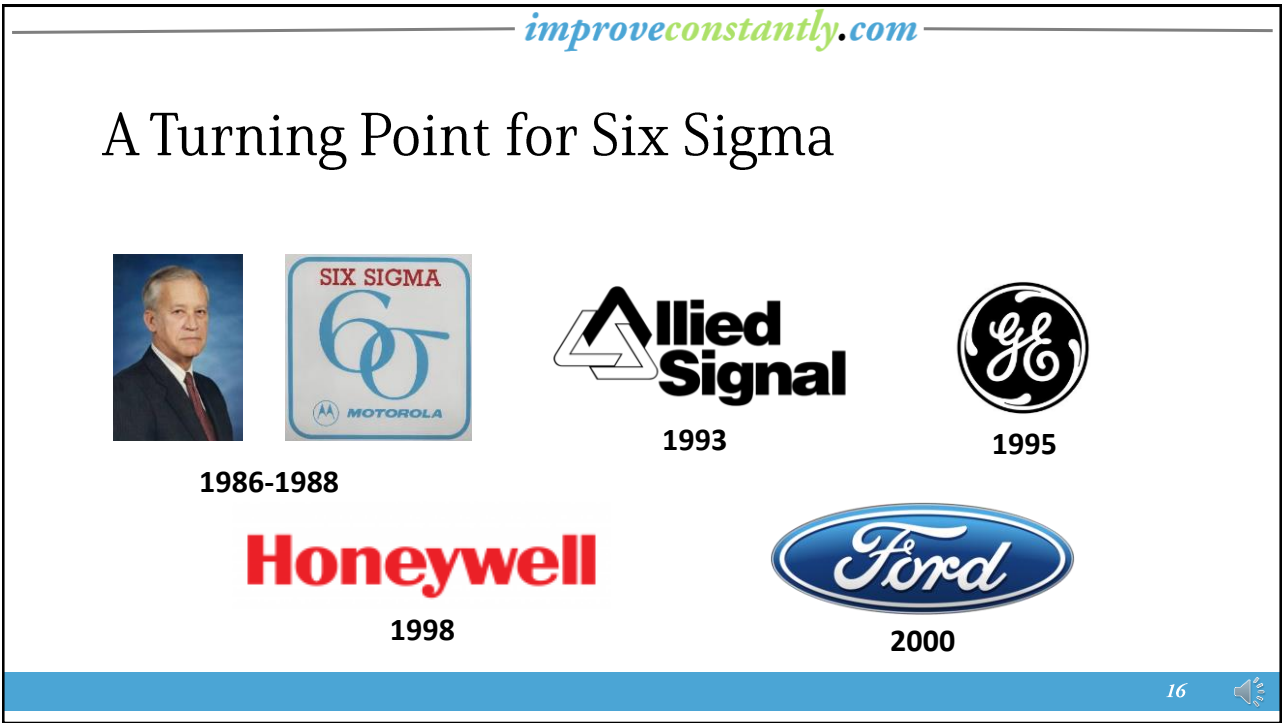
1990: Introduction of ISO 9000 Series of Quality Management Standards(1987) and Malcolm Baldrige Award created by the U.S. Congress (1987)

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The Value of Six Sigma to the Organization

- **Improved bottom line for the business** – over time, as variation is reduced, defects, rework and other costly issues are diminished
- **Increased customer satisfaction** – Customers, both internal and external have an improved experience
- **Simplified work processes** – As work become more consistent, the processes become easier and simpler for the workers to carry out
- **Development opportunities** for future organizational leadership as opportunities arise to get additional training and to participate/lead improvement efforts

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The Value of Six Sigma to the Organization

- **Systematic elimination of waste**, poor-quality issues, and labor-intensive work
- **Workforce empowerment** to collaborate, investigate and implement solutions to improve the businesses work processes
- **Business management based on metrics**, data and objective evidence rather than emotion and “gut feel”

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Six Sigma - Results

- **General Electric** increased profitability by *\$7 – \$10 billion* in five years
- **DuPont** added *\$1 billion* to its bottom line within two years of implementation
- **Bank of America** saved *hundreds of millions of dollars*, and *cut cycle times by more than half* in the first three years
- **Honeywell** saved *\$2 billion* in direct costs and achieved record operating margins
- **Motorola** saved *\$4.4 billion* in four years



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Six Sigma Summary

Six sigma is an organization wide approach to statistically improving processes **with the aim of reducing variation**. By reducing variation, processes are more consistent, reliable, and predictable.

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Session Recap

- Recognize why organizations use Six Sigma
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