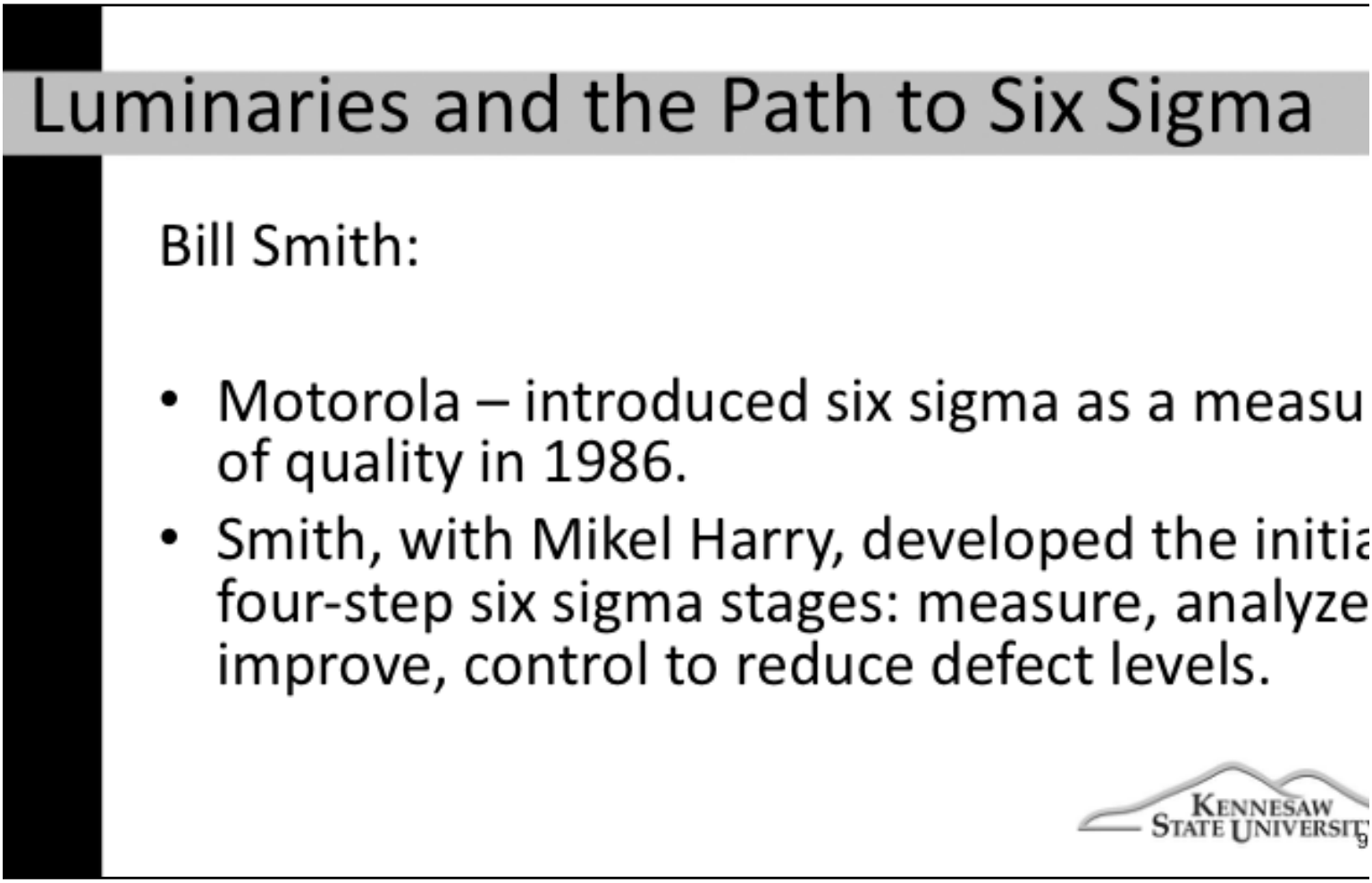

Motorola – introduced six sigma as a measure of quality in 1986. Bill Smith, with Mikel Harry, developed the initial four-step six sigma stages: measure, analyze, improve, control to reduce defect levels.

Luminaries and the Path to Six Sigma

Mikel Harry:

- Motorola
- With Richard Schroeder, founded Six Sigma Academy in 1994.
- Main architect of six sigma movement.

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Mikel Harry, with Richard Schroeder, went on to found Six Sigma Academy in 1994. Mikel Harry is considered the main architect of six sigma movement.

Luminaries and the Path to Six Sigm

Crosby's Four Absolutes

1. The definition of quality is *conformance to requirements.*
2. The system of quality is prevention.
3. The performance standard is zero defects (close to Six Sigr
4. The measurement of quality is the price of nonconformanc

"Do it right the first time."

The foundations of Six Sigma can be traced to a group of highly knowledgeable individuals in quality.
Crosby's Four Absolutes for quality conformance and prevention are high level statements that help us define and frame the idea of quality within the realm of our business.

Luminaries and the Path to Six Sigma

Deming's 14 Points:

1. Create constancy of purpose toward improvem of product and service. Innovate, allocate resources to long-term planning. Put resource into research and education.
2. Adopt the new philosophy. Do not tolerate commonly accepted levels of errors and defect

Dr. Deming is another quality guru who has made substantial contributions to the body knowledge that we quality. These can be summed up at Deming's 14 points.
These include a constancy of purpose toward improve and an unwillingness to accept commonly occurring defects and errors.

Luminaries and the Path to Six Sigma

Deming's 14 Points:

3. Cease dependence on mass inspection to achieve
   Inspection does not improve quality. Quality is bu
   product and cannot be inspected into it.
4. End the practice of awarding business on the basis
   tag alone. Minimize total cost by working with
   supplier.

Deming strongly opposed inspecting quality into a product and focusing exclusively on price at the expense of quality. There is no reason why we cannot have both if we are strategic.

Luminaries and the Path to Six Sigma

Deming's 14 Points:

5. Improve constantly and forever every process fo
   planning, production, and service. Continually i
   test methods and identify problems, from the ve
   planning stages right up to distribution to custo
6. Institute training on the job. In Japan, manager
   their careers with a long internship. They work i
   procurement, accounting, distribution, and sale

Deming was a huge proponent of continual improvement at a time when most industries looked to sustain their position in the marketplace as oppose to seize opportunities for growth. This continual improvement also can reflected in terms of training. Training on the job, cross training, and confirming that training is still valid.

Luminaries and the Path to Six Sigma

Deming's 14 Points:

7. Adopt and institute leadership. The job of management is not supervision, but leadersh

8. Drive out fear. No one can perform unless he she feels secure.

Deming points to the difference between supervision and leadership and the need to drive fear out of the organization. If an organization is driven by fear, it will never achieve and grow.

Luminaries and the Path to Six Sigma

Deming's 14 Points:

9. Break down barriers between staff areas. Create tea of members coming from all areas and sectors of th business to prevent and solve problems.

10. Eliminate slogans, exhortations, and targets for the workforce. Posters and slogans have never helped anyone to do a better job.

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Dr. Deming believed in keeping the message simple in the organization. Breaking down barriers and building cross functional teams from all areas of the business.

Luminaries and the Path to Six Sigma

Deming's 14 Points:

11. Eliminate numerical quotas for the workfo and numerical goals for management.

12. Remove barriers that rob people of the pr workmanship. Eliminate the annual rating c system.

Deming was not very enthusiastic about numerical quotas for the workforce or numerical goals for management. Even today, every organization has a difficult time moving away from the need for numerical metrics as means of tracking performance. He also had little use for merit systems and annual ratings and instead felt that these mechanism fed into employee fear and created an environment of competitiveness instead of collaboration.

Luminaries and the Path to Six Sigma

Deming's 14 Points:

13. Institute a vigorous program of educatio and self-improvement for everyone.

14. Put everyone in the company to work to accomplish the transformation.

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Finally, in line with his ideas of continuous improvement, Deming envisioned an organization heavy into the education and self-improvement of every employee. Employees are the organization most valuable assess. They should be treated as such. Once you have raised the level of knowledge of your employees, utilize them and everyone to transform your business. Too often, organizations have segments of their employee population that go unutilized or under-utilized.

Luminaries and the Path to Six Sigma

Feigenbaum's Total Quality Control:

- *Total control of quality* **and** *control of total qua*
- Apply quality to all stages from design to delive
- Share quality responsibilities among functions
- Quality is not only the manufacture of a produ

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Feigenbaum had some similar yet distinct insights into quality beyond the manufacturing floor. By focusing our quality efforts in the design and delivery realms, we can see gains in areas out of the scope found on the manufacturing floor.

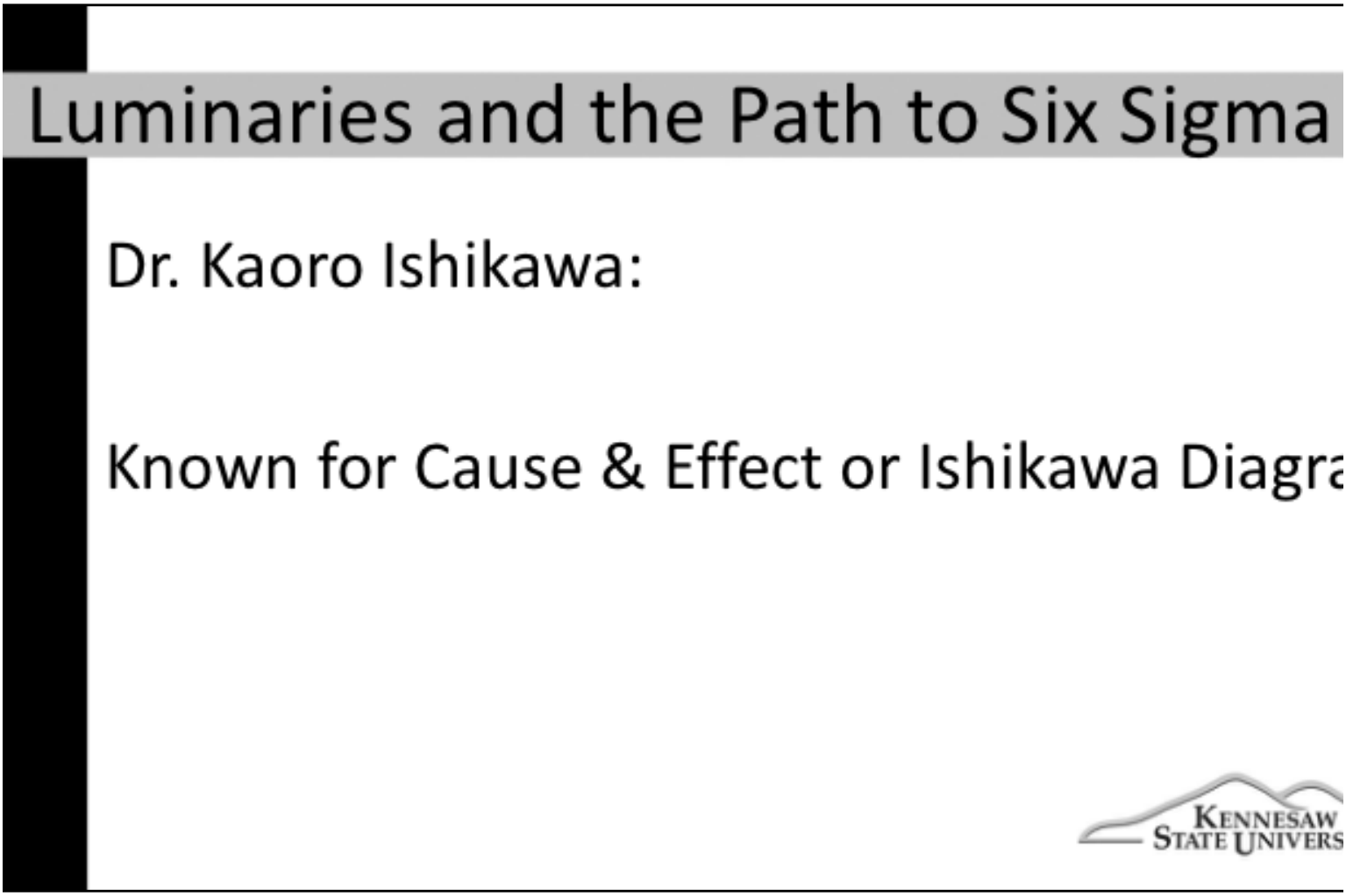
Luminaries and the Path to Six Sigma

Total Quality Control:

- … is an effective system for integrating the quality-development, quality-maintenance, and quality improvement efforts of the various groups in an organization so as to enable production and service at the most economical levels which allow for full customer satisfaction.

» Feigenbaum (1991)

In summation, Feigenbaum characterized Total Quality Control as an effective system for integrating the quality-development, quality-maintenance, and quality improvement efforts at the most economical levels



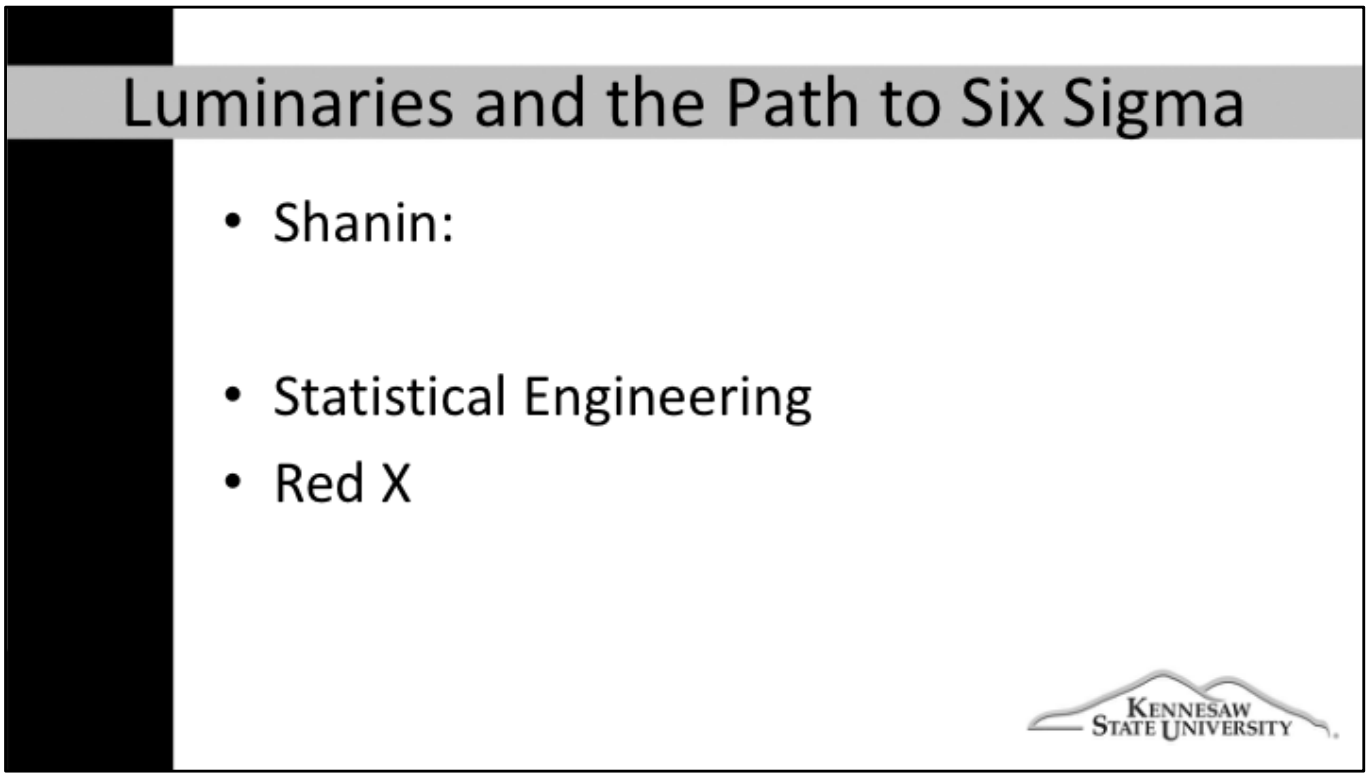
Other contributions found in various stages of the Six Sigma process come from Ishikawa, who is known for the fish-bone diagram and the Five Why's

Luminaries and the Path to Six Sigma

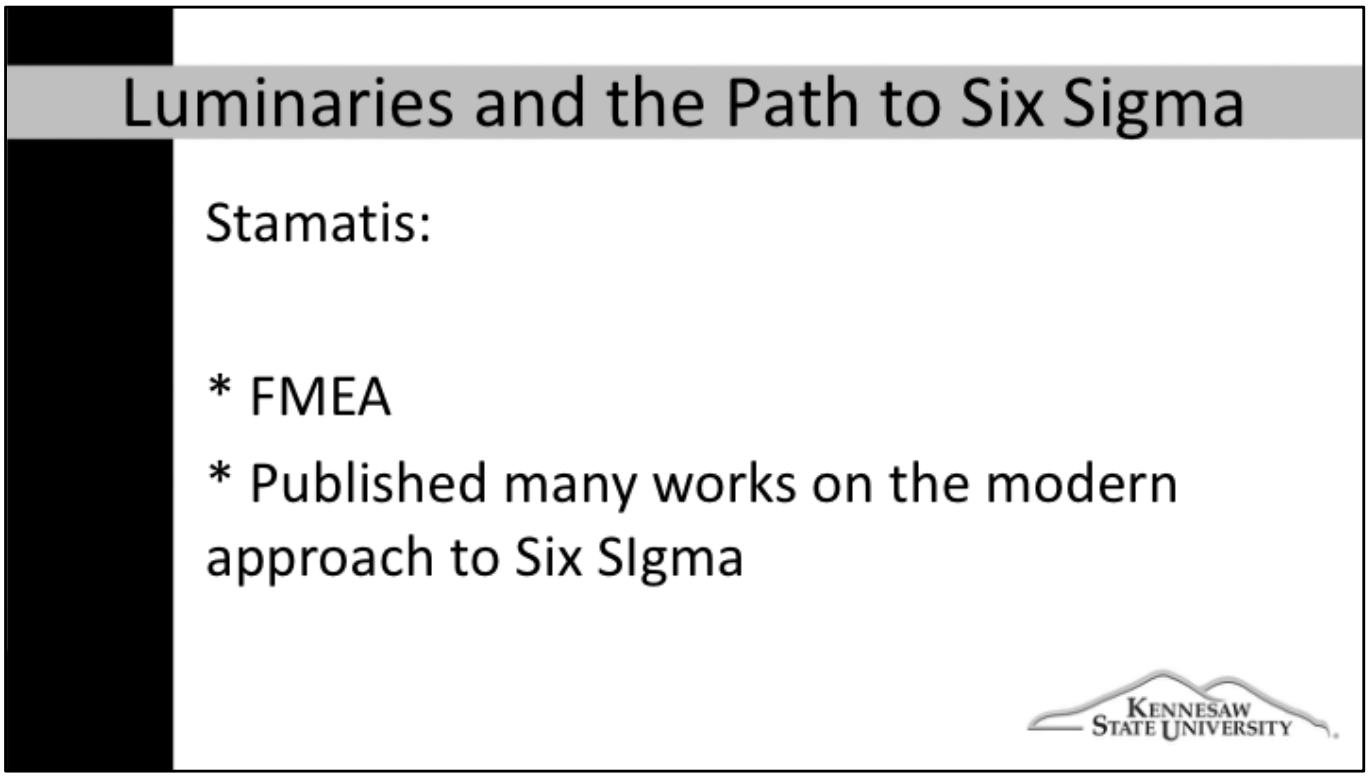
Juran's Trilogy:

- Quality Planning
- Quality Control
- Quality Improvement

Another luminary in quality circles is Juran. Juran's most significant contribution is known as Juran's Trilogy. This includes Quality Planning, Control and Improvement



Shanin advanced many techniques evolving around the principles variance and statistical engineering. In any problem there is most always a dominant variable that virtually defines the extent of the problem. This is based on Pareto Principle, the 80/20 rule. A dominant cause is a varying process input for which a small variation causes an unusually large variation in the output. This became known as the Dominant Cause(s) Principle: Very few input variables are responsible for most of output variation.



D.H. Stamatis' published contributions exceed more other luminaries in quality. He most noted for his foundational work in Failure Mode and Effects Analysis.

Luminaries and the Path to Six Sigma

Dr. Genichi Taguchi:

- Father of Quality Engineering
- Loss Function
- Robust Design

Taguchi was another quality guru who recognized the importance of initiating the proper quality at he engineering and design levels of the process

Luminaries and the Path to Six Sigma

Dr. Walter Shewhart

- Assignable and Chance causes
- Statistical Process Control
- PDCA

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Once we have established the causes, Shewart took things forward by identifying assignable and chance causes. These causes can be monitored through Statistical Process Control and confirmed through PDCA (Plan Do Check Act)