Software Quality Assurance & Six Sigma

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CECS 445

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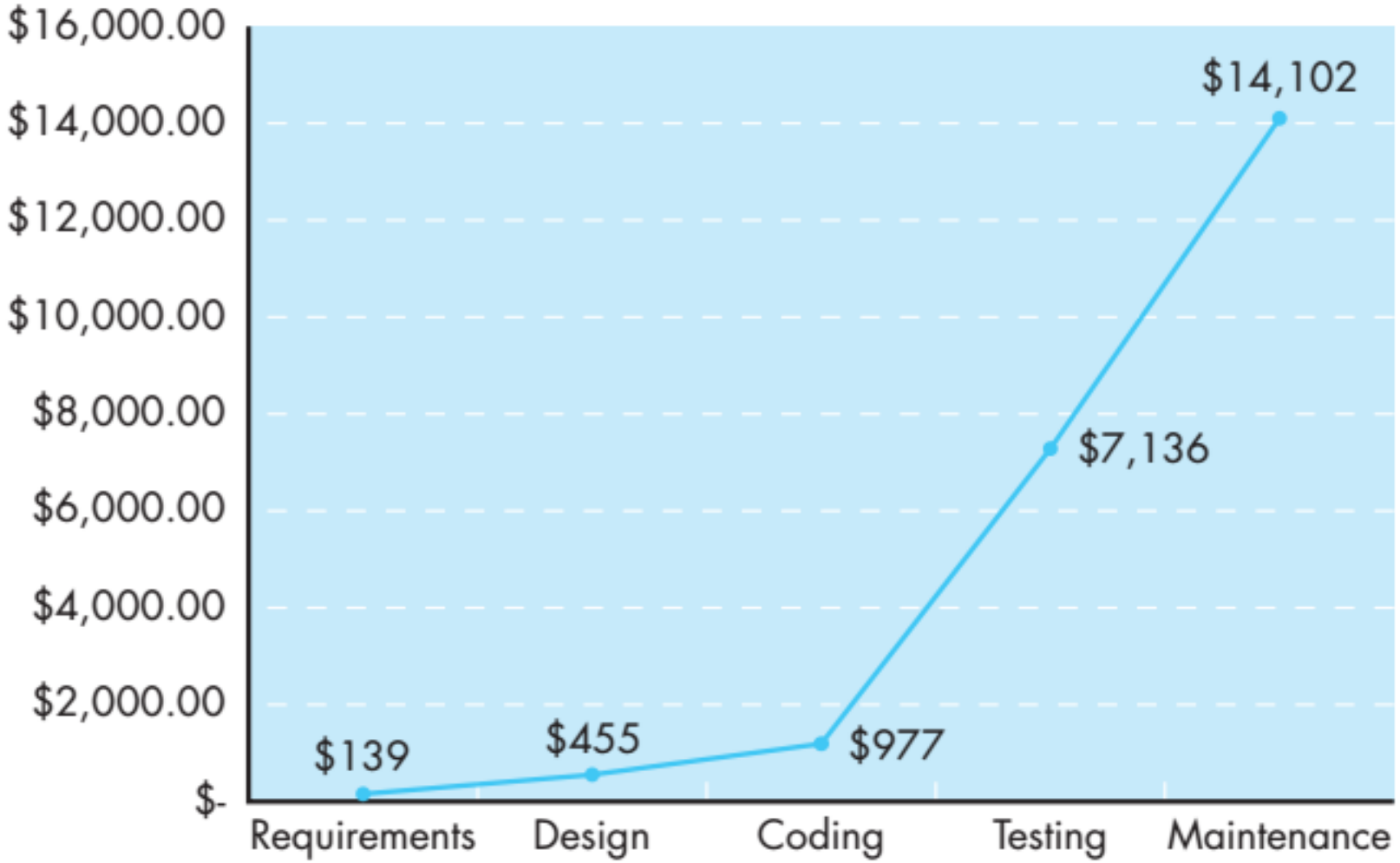
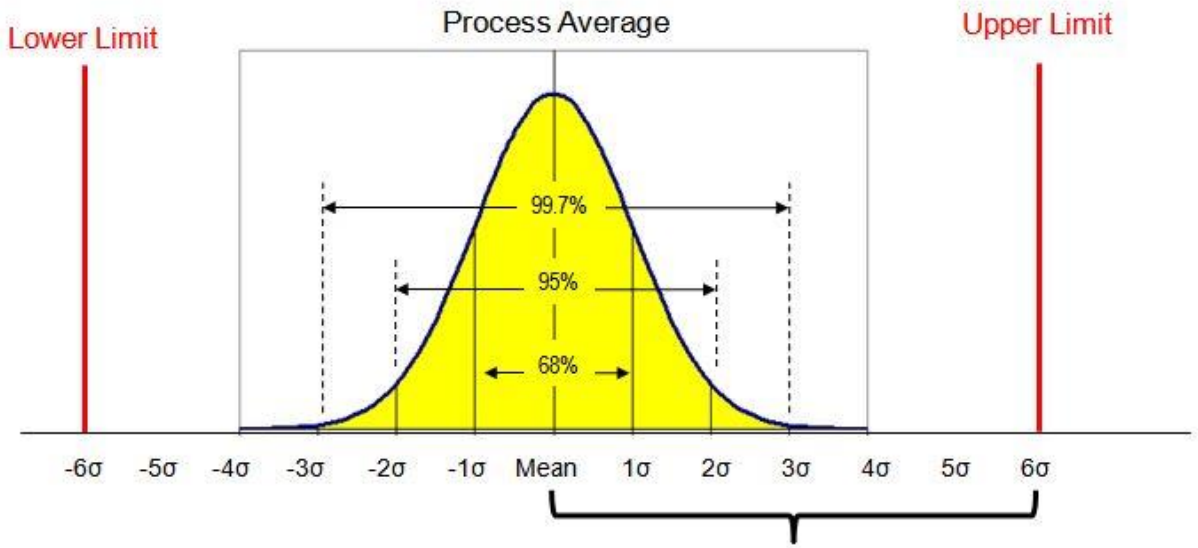
Software Quality Example: Good or Bad?



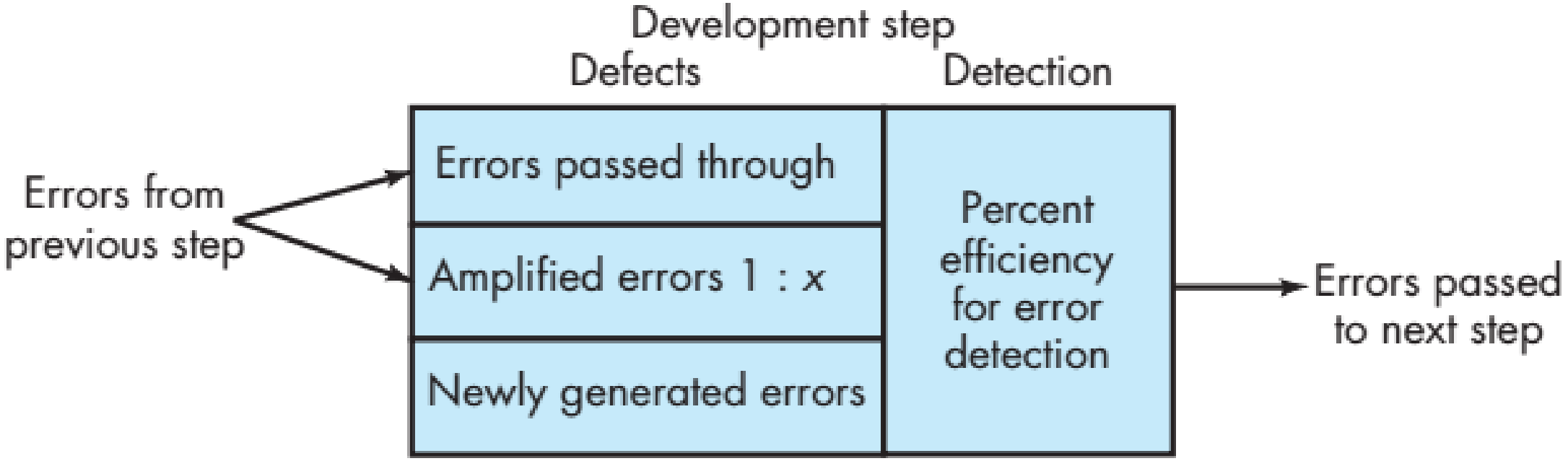
Six Sigma

- *Define* customer requirements and deliverables and project goals via well-defined methods of customer communication.
- *Measure* the existing process and its output to determine current quality performance (collect defect metrics).
- *Analyze* defect metrics and determine the vital few causes.

- *Improve* the process by eliminating the root causes of defects.
- *Control* the process to ensure that future work does not reintroduce the causes of defects.



Measure Defects – *Defect Amplification Model*



$$\text{Error density} = \frac{\text{Err}_{\text{tot}}}{\text{WPS}}$$, WPS = # of requirements for that cycle

Analyze Defects – *Error Density, Availability & MTBF*

$$\text{Error density} = \frac{\text{Err}_{\text{tot}}}{\text{WPS}}$$, WPS = # of requirements for that cycle

$$\text{MTBF} = \text{MTTF} + \text{MTTR}$$

Mean-Time-Between-Failure (MTBF)

Mean-Time-To-Failure (MTTF)

Mean-Time-To-Repair (MTTR)

$$\text{Availability} = \frac{\text{MTTF}}{(\text{MTTF} + \text{MTTR})} \times 100\%$$

Improve & Control

Value Stream Mapping: Value stream maps illustrate the flow of materials and information in one of the processes. It helps with optimizing flow within companies.

Pareto Chart: The Pareto chart illustrates the differences between particular data groups allowing the Six Sigma teams to point out the most significant threats against the process.

Regression Analysis: Regression analysis is a statistical approach, used to ascertain the negative or positive relationships among several variables.

Kaizen: This is a practice of continual observation, identification, and implementing particular improvements to the production process.

Kai = Change

Zen = For the Better

Improve & Control – Kaizen & Quality Circles