Week 6

- Things to consider before developing a solution / improving the quality
- Quality improvement & breakthrough performance (Chapter 5)
- Six sigma approach / DMAIC (Chapter 15)
- Root cause analysis / tools and techniques (Chapter 16)

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QUALITY MANAGEMENT 444

WEEK 6
LECTURE 11

Chapter 5

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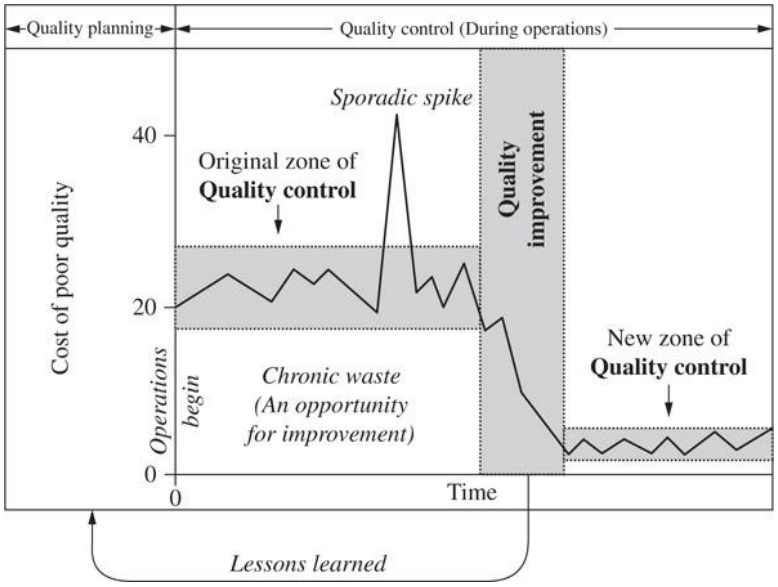
Quality Management



Quality planning. Operational planning directed at product and process planning. This includes the broad array of activities that collectively create overall quality plan.

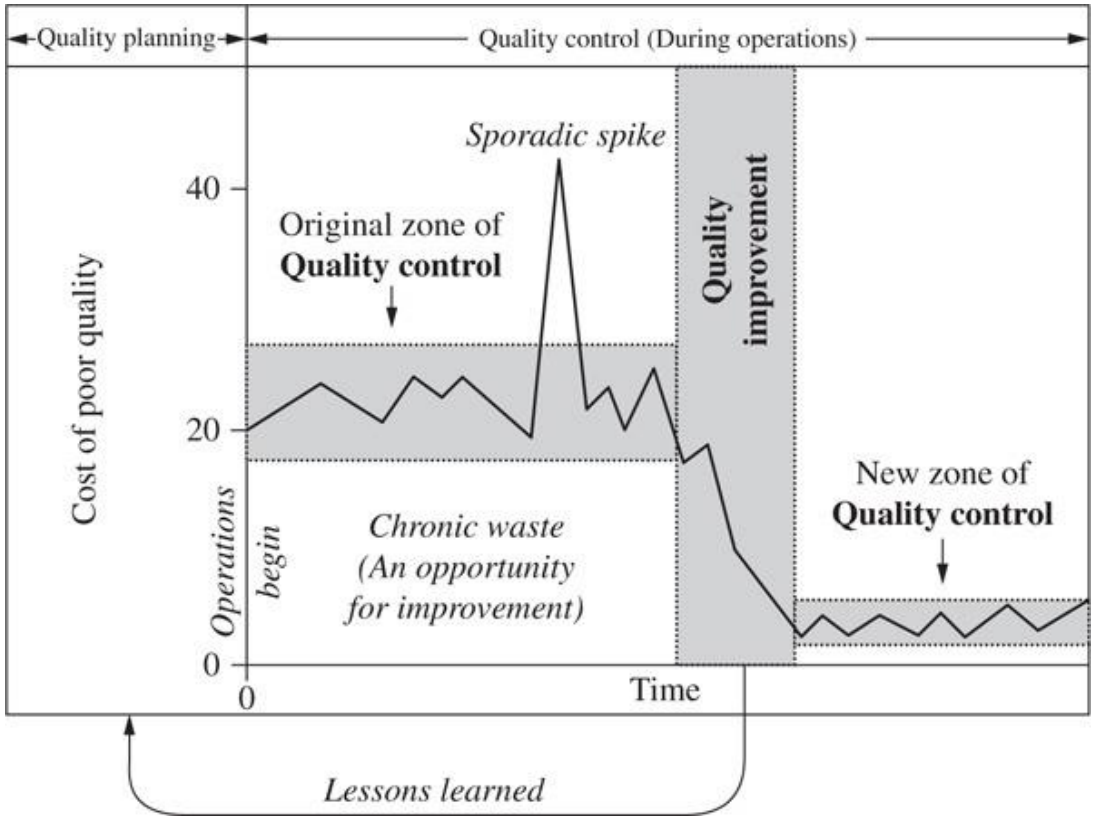
Quality control. Refers to the process employed to meet standards consistently and to hold gains. The control process involves observing actual performance, comparing it with some standard and taking action of the observed performance is different from the standard, and the required change is justifiable.

Quality improvement. Quality improvement plays a dominant role in reducing the costs of deficiencies, waste and driving out defects - thus achieving improved levels of performance.

Quality improvement and breakthrough performance

Quality Planning	Quality Control	Quality Improvement
Establish goals	Determine the control subjects	Prove the need with a business case
Identify who are the customers	Measure actual performance	Establish a project infrastructure
Determine the needs of the customers	Compare actual performance to the targets and goals	Identify the improvement projects
Develop features which respond to customers' needs		Establish project teams
Develop processes able to produce the products	Take action on the difference	Provide the teams with resources, training, and motivation to: Diagnose the causes Stimulate remedies
Establish process controls transfer the plans to the operating forces	Continue to measure and maintain performance	Establish controls to hold the gains

Quality improvement and breakthrough performance



(a few) ‘Things’ to consider

- The big picture
- What’s the aim? (What are you trying to do?)
- Types of quality problems
- Complex adaptive systems

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Big picture (5W2H approach)

5 W'S	WHAT?	Subject – identify and describe the problem.
	WHY?	Purpose – identify known explanations which enable the problem.
	WHERE?	Location – where did the problem occur?
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2 HOWS	HOW?	Method – in what situation did the problem occur?
	HOW MUCH?	Cost/ Impact – quantify the extent of the problem.

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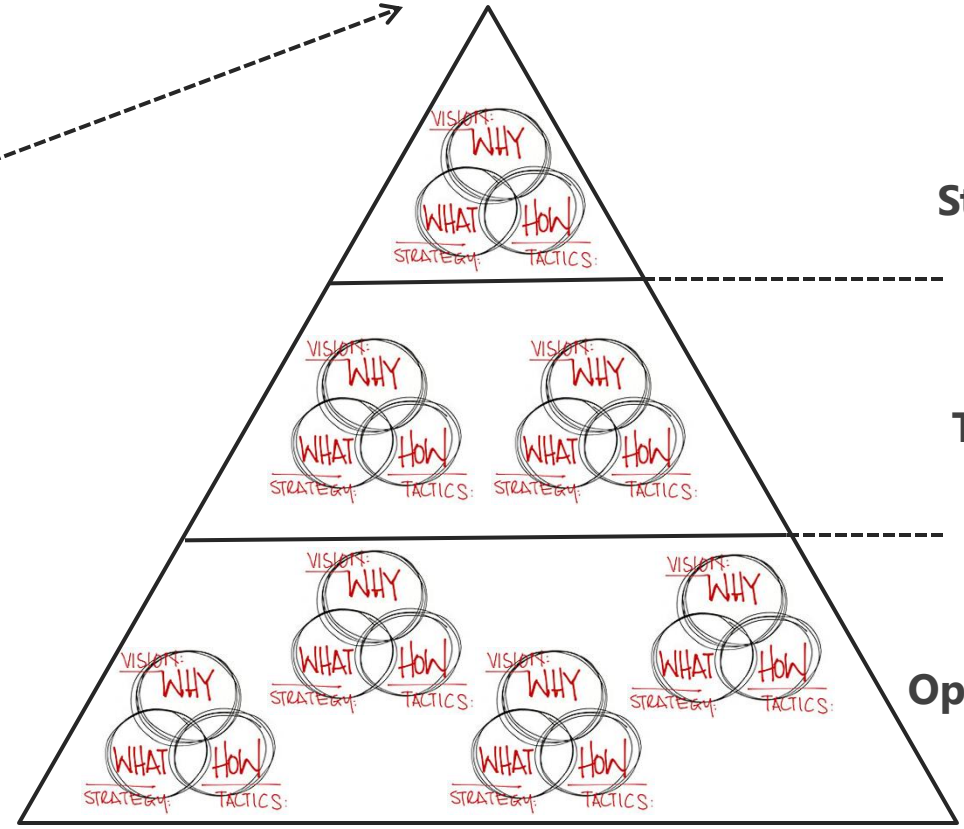
The big picture



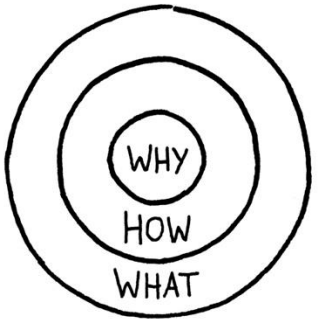
Why, what and how

WHY?	WHAT?	HOW?
The need for change	What are we trying to do (our strategy)?	How to address the problems?
The vision	What are we dealing with? (Types of problems)	How to implement change?

Dealt with ‘why’ in Week 5, right?

The big picture

Some of you might have seen this… (?)



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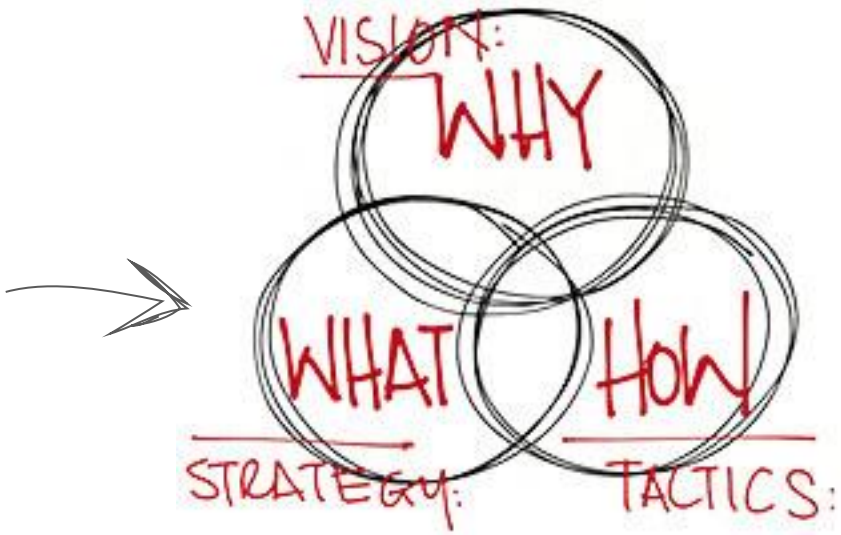
What?



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What's the aim?

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What's the aim?

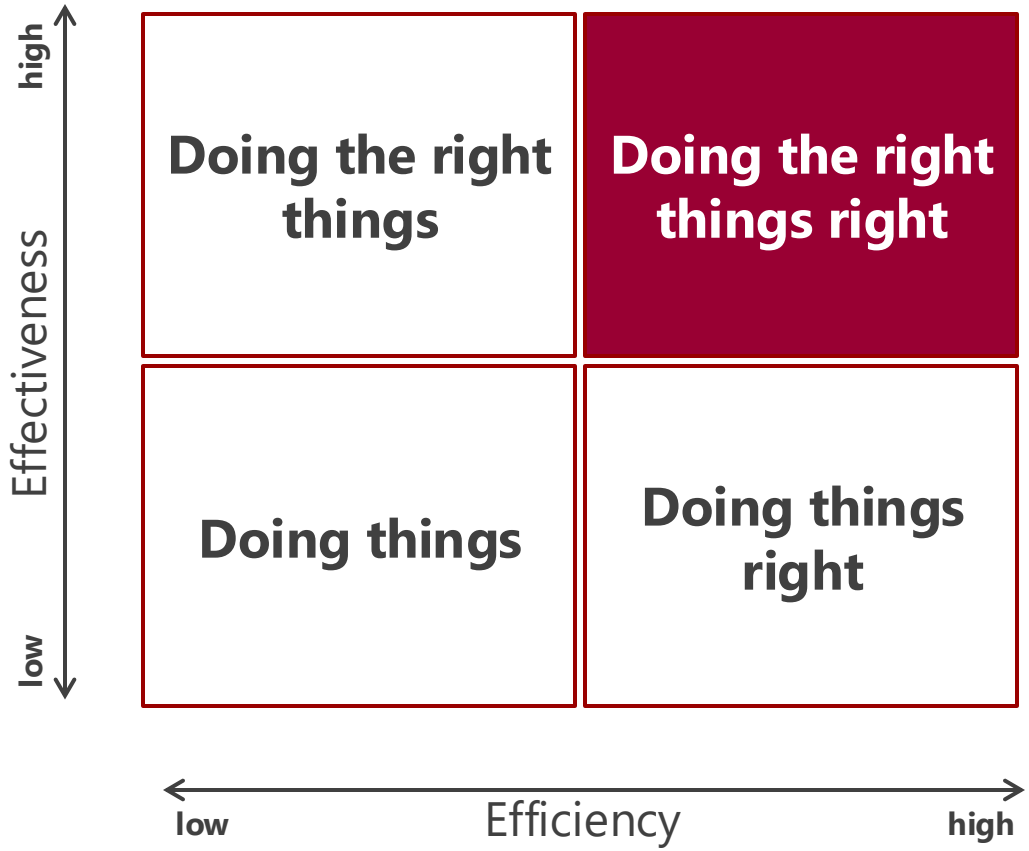
Sound strategy x Operational Excellence = Leading Performance

1 x 0 = 0

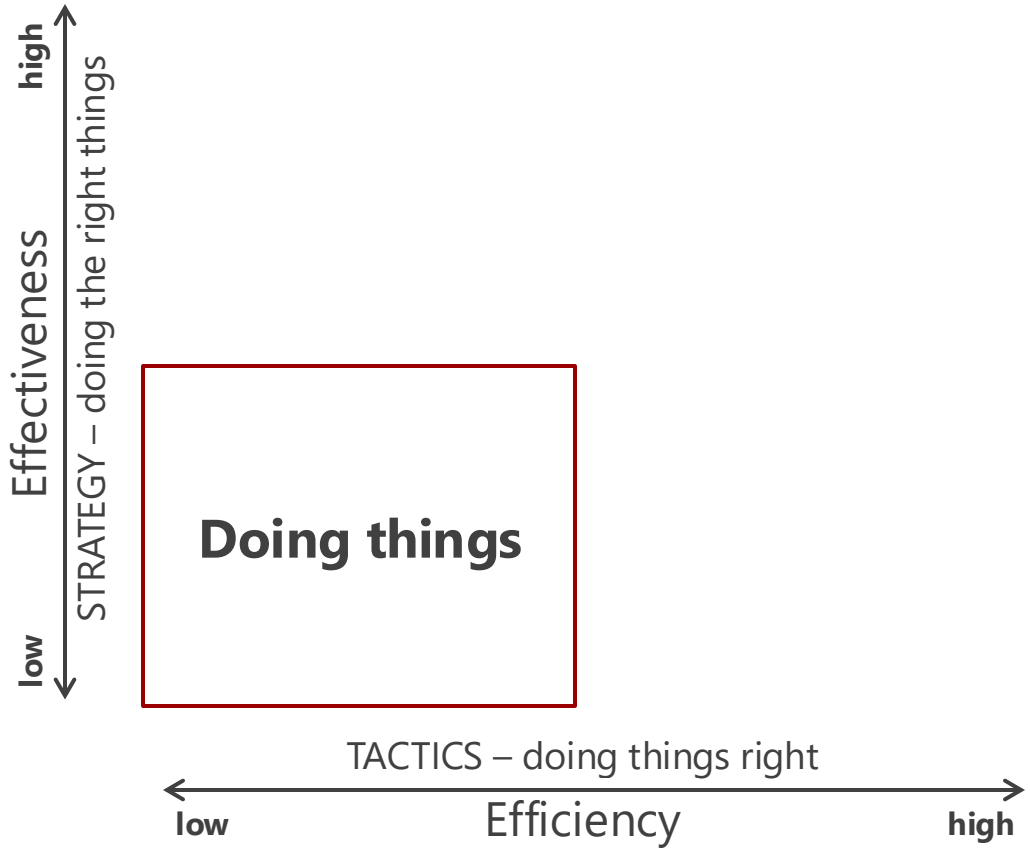
0 x 1 = 0

Effectiveness vs. Efficiency

Effectiveness vs. Efficiency



Effectiveness vs. Efficiency



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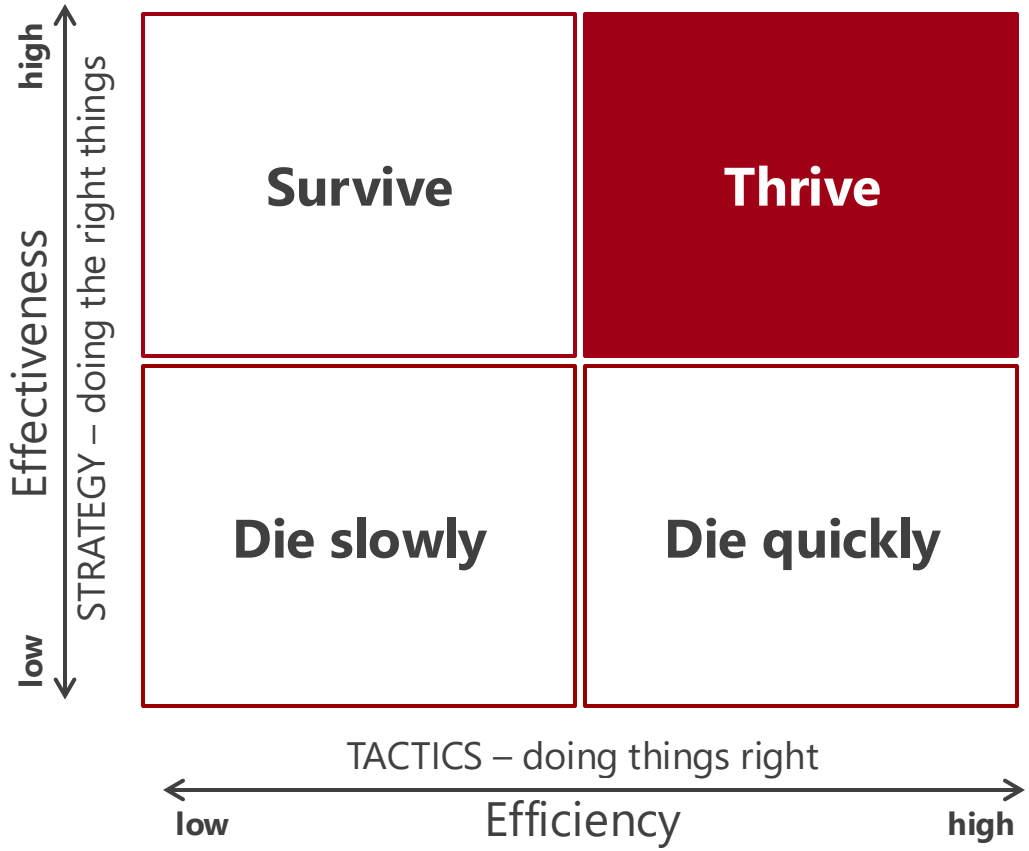

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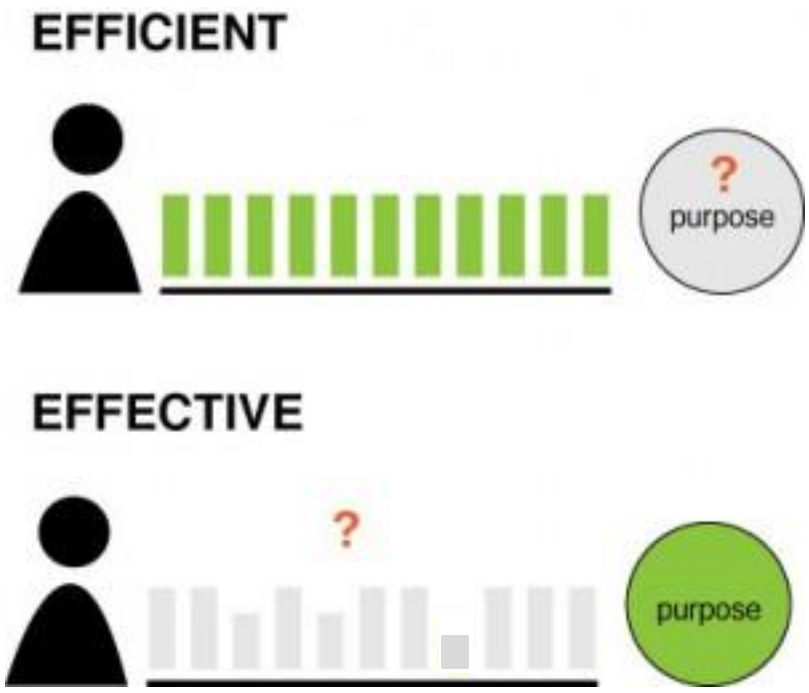

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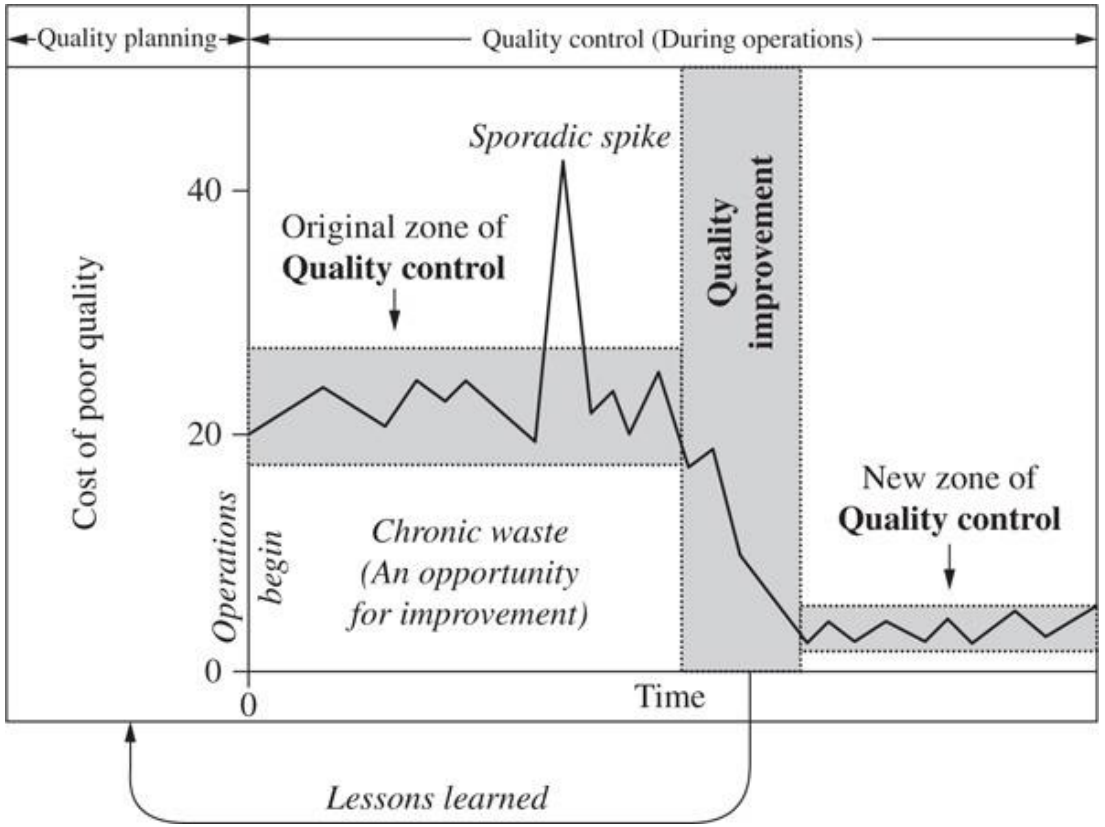
Types of (quality) problems

- Fire fighting
- The system is working (not) just fine
- Growth
- The ‘iPad-type’ problem

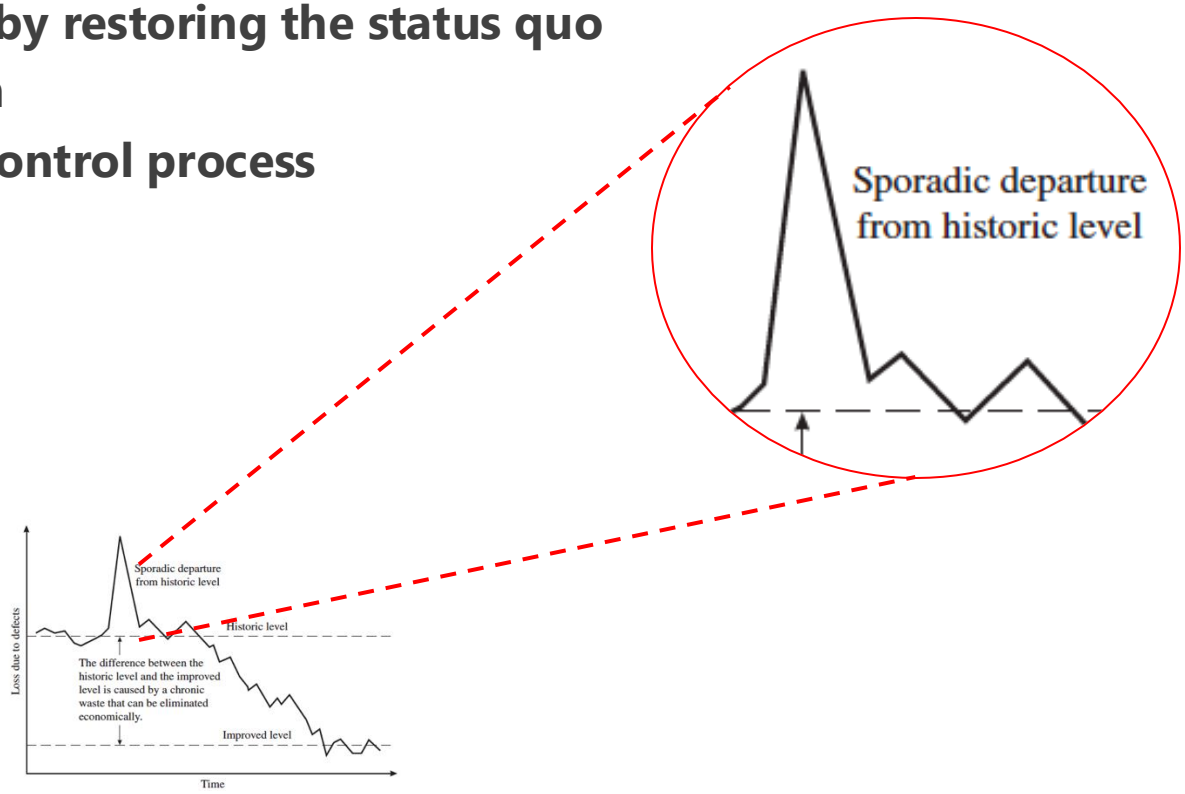
- Sporadic problems
- Chronic problems
- Future orientated problem
- Innovation

Sporadic and chronic quality problems



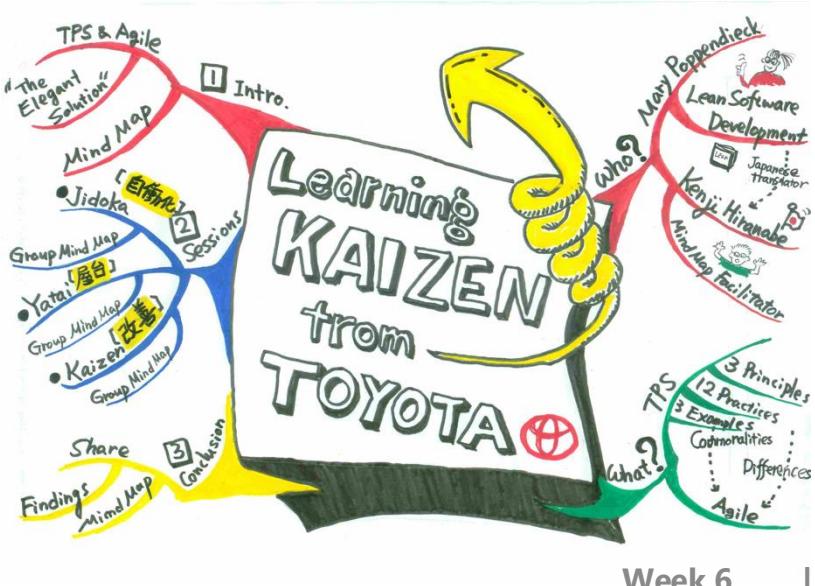
Sporadic quality problems

- **Sudden, adverse change in the status quo**
  - ⊙ **Dramatic**
  - ⊙ **Requires remedy by restoring the status quo**
  - ⊙ **Once-off problem**
  - ⊙ **Attacked by the control process**



Chronic quality problems

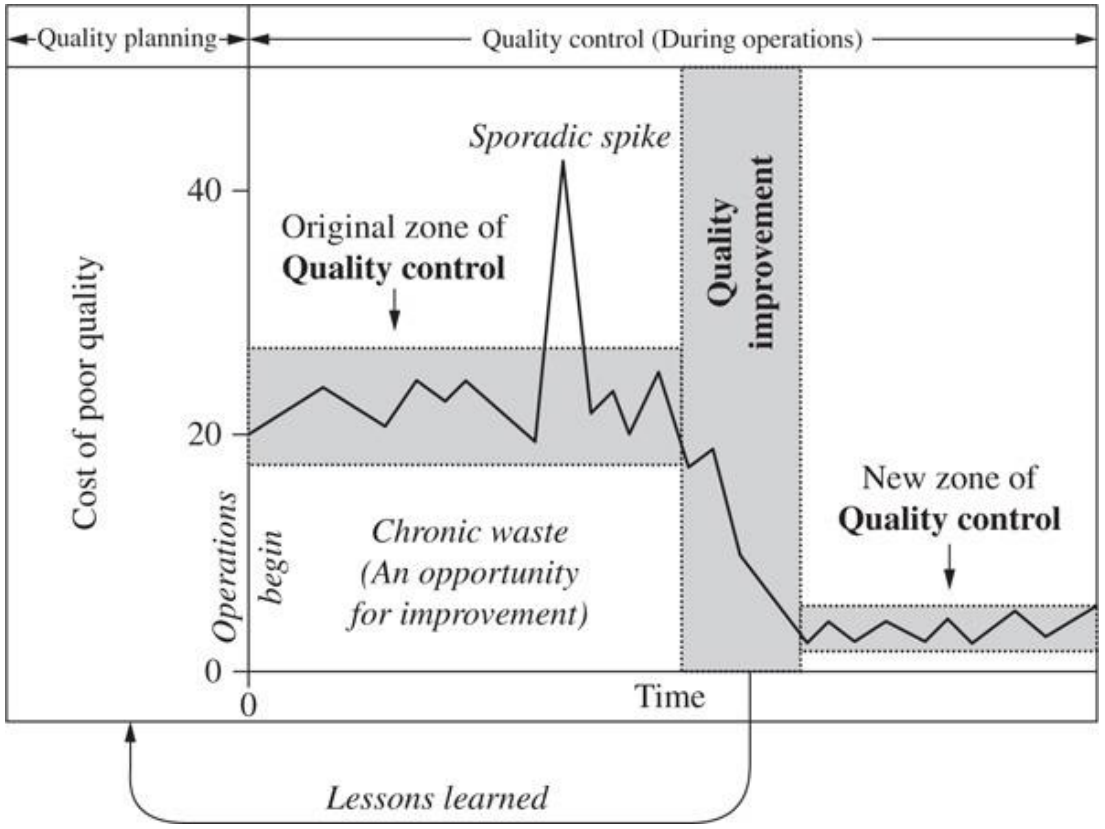
- **Long-standing adverse situation**
  - ⊙ **Requires remedy by changing the status quo**
  - ⊙ **Difficult to solve, accepted as inevitable**
  - ⊙ **Chronic problems are accepted as inevitable**
  - ⊙ **Continuous improvement addresses chronic problems, involving the whole organisation**
    - ⊙ **Kaizen**
    - ⊙ **http://www.thetoyotasystem.com/lean_concepts/kaizen.php**



Kaizen at TOYOTA

https://www.youtube.com/watch?v=wot9DFzFRLU

Impact on cost (of (poor) quality)?

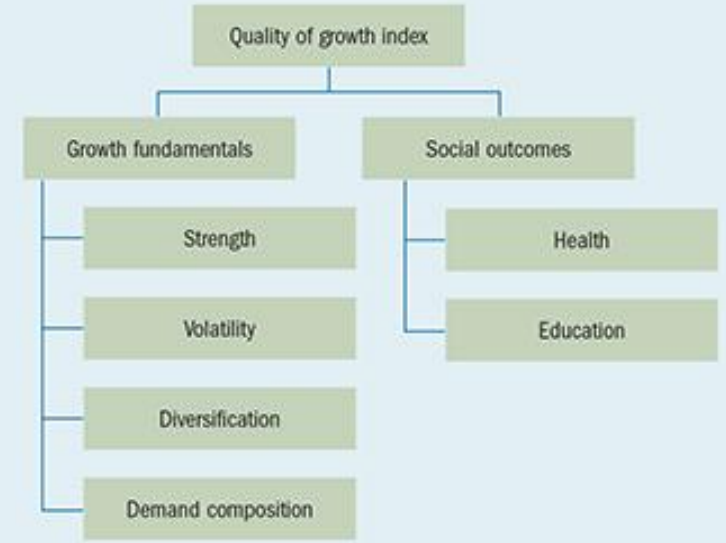


Growth: ensuring a quality future

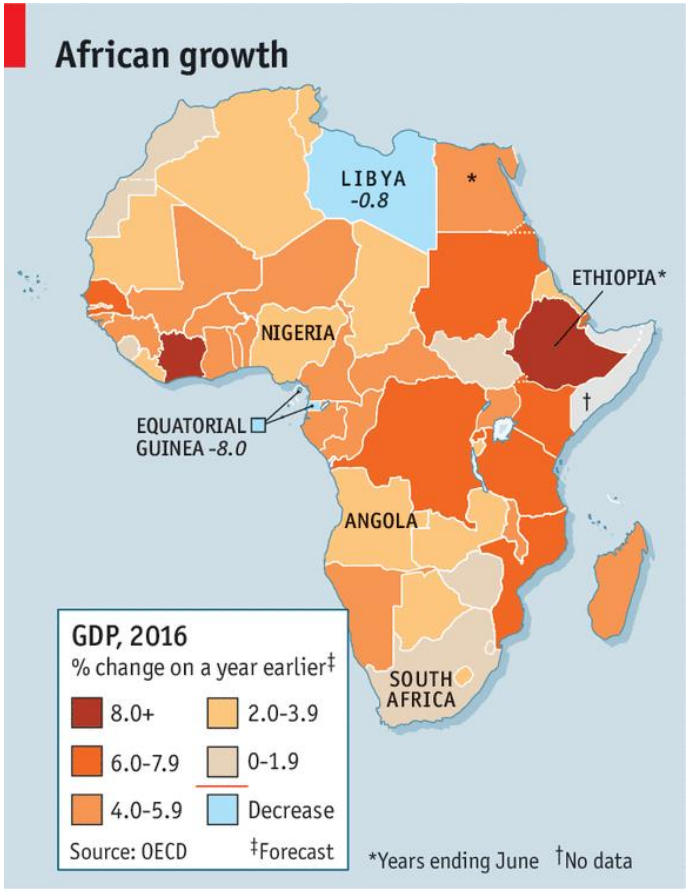
Chart 1

Two-pronged growth

The quality of growth index takes into account both growth fundamentals and social outcomes.



Source: Mlachila, Tapsoba, and Tapsoba (2014).



Economist.com

(disruptive) Innovation

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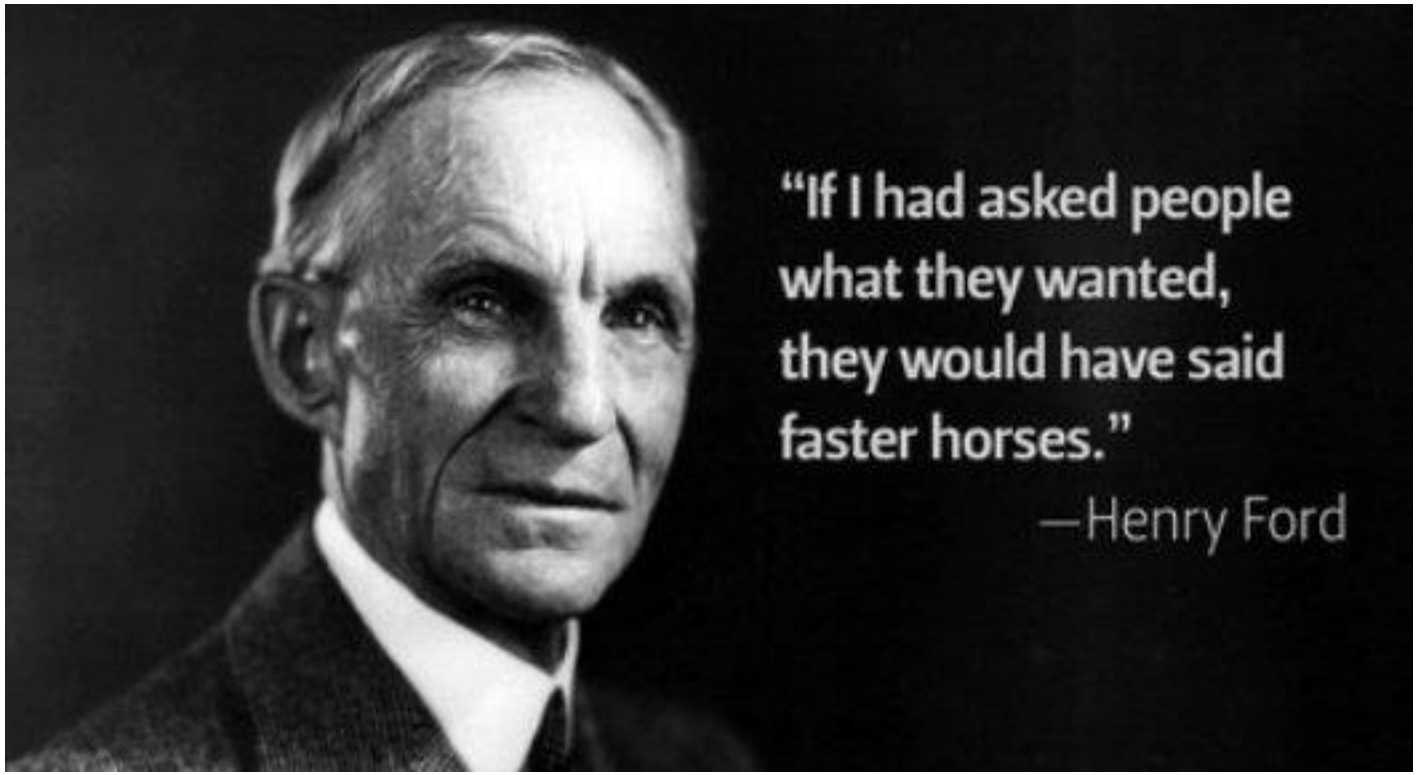

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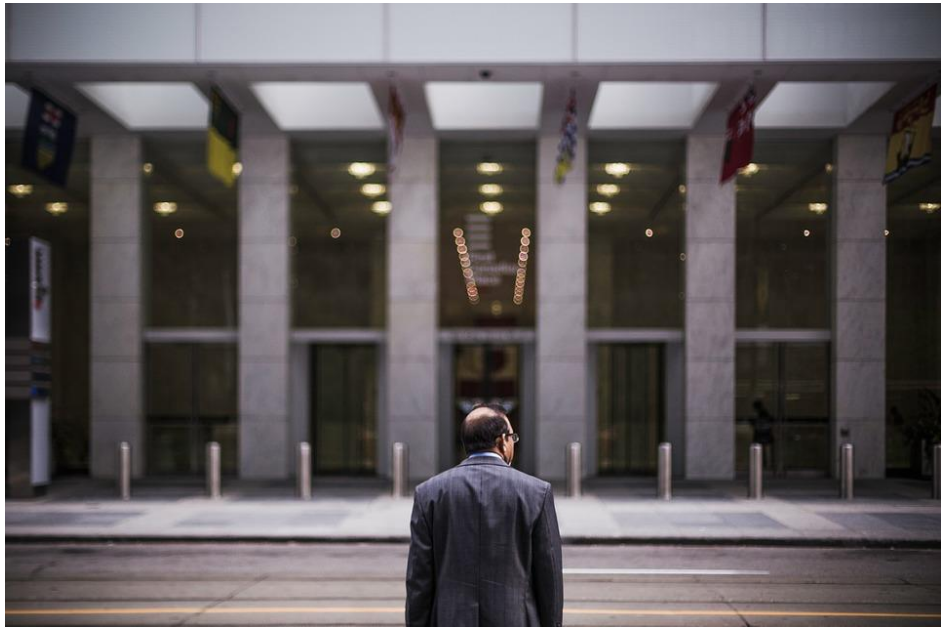
Complexity & CAS



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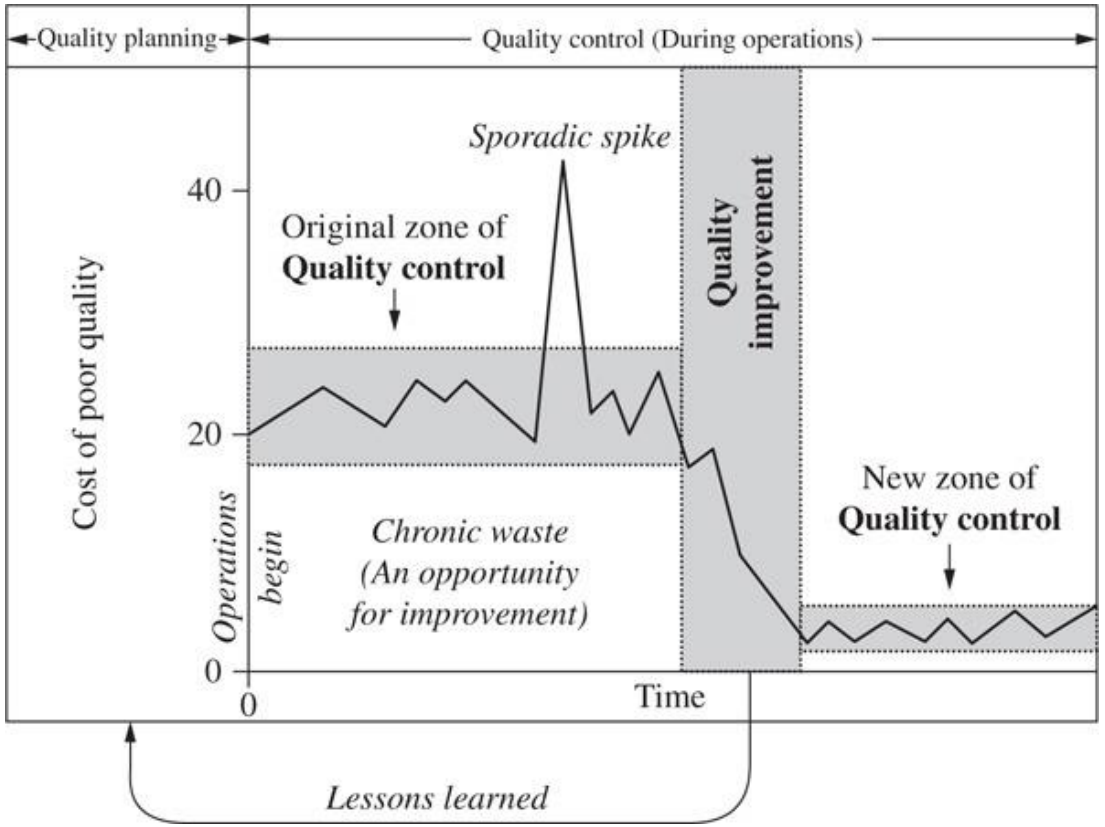
Chronic quality problems



Breakthrough performance

Performance breakthroughs can be aimed at both sides of quality:

- ✓ Having **higher-quality product and service features** provides customer satisfaction and revenue for the producing organization. These product features drive revenue.
- ✓ Achieving **freedom from failures** will reduce customer dissatisfaction and non value-added waste. To the producing organization, reducing the product failures, which reduce costs, is a target for breakthrough.

- ⊙ **Project selection** requires expertise and practice on the part of management, so "doable" projects are identified so that the team clearly understands both the **problem and the goal**.

- ⊙ To attain a breakthrough in current performance requires **two "journeys":** the diagnostic journey and the remedial journey. These journeys represent the application of the fact-based method to solve the performance problems.

- ⊙ The **diagnostic journey** proceeds as follows:
  i. From problem to symptoms of the problem
  ii. From symptoms to theories of causes of the symptoms
  iii. From theories to testing of the theories
  iv. From tests to establishing root cause(s) of the symptoms
- ⊙ The **remedial journey** proceeds as follows:
  i. From root cause(s) to design of remedies of the cause(s)
  ii. From design of remedies to testing and proving the remedies under operating conditions
  iii. From workable remedies to dealing with predictable resistance to change
  iv. From dealing with resistance to establishing new controls on the remedies to hold the gains

Breakthrough performance

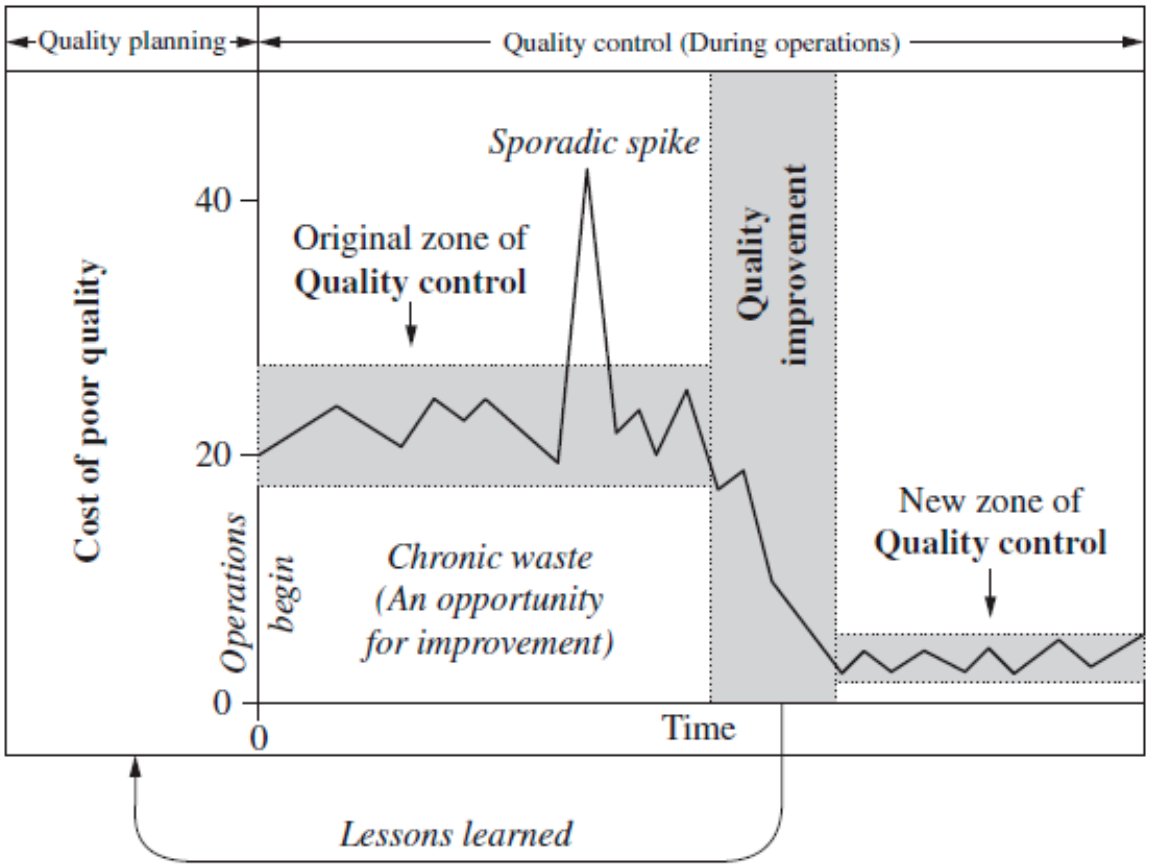
- The Juran Universal Sequence for Breakthrough, identified in the 1950s, consists of six steps to achieve superior results. The steps are:
  i. Nominate and identify problems (projects).
  ii. Establish a project and team.
  iii. Diagnose the cause(s).
  iv. Remedy the cause(s).
  v. Hold the gains.
  vi. Replicate results and nominate new projects.

- Improvement happens **project by project**. To achieve breakthrough requires leaders to define goals and projects that are resourced to ensure completion and results.

- It is upper management's responsibility to **mandate breakthrough**. Specifically, upper management must
  i. Establish multifunctional councils or steering teams to prioritize projects.
  ii. Nominate and select breakthrough projects.
  iii. Create project charters that include problem and goal statements.
  iv. Provide resources, especially people and time, to carry out the project.
  v. Assign teams, team leaders, and facilitators, "Black Belts" to projects.
  vi. Review progress, remove barriers, and manage cultural resistance.
  vii. Provide recognition and rewards.

Breakthrough performance

Figure 5.3 The Juran Trilogy. (Juran Institute, Inc., 1986.)



Structured approach to quality improvement

The problem: CHRONIC PROBLEM

The approach: PROJECT-BY-PROJECT

- **Three main steps (setting up):**
  - **Proving the need (business case)**
  - **Establish project infrastructure**
  - **Identifying projects**
  - **Organising and launching project teams**

- **Quality improvement projects involve these tasks (carrying out):**
  - **Defining the project scope and charter**
  - **Diagnosing the causes**
  - **Providing a remedy / solution and proving its effectiveness**
  - **Dealing with resistance to change**
  - **Instituting controls to hold the gains**

The business case for quality improvement

- Estimate the size of the chronic waste or other quality related losses
- Estimate the savings and other benefits
  - If the organization has never before undertaken a program to reduce quality related costs, then a reasonable goal is to cut these costs in half, within five years
  - Don't imply that the quality costs can be reduced to zero
  - For any benefits that cannot be quantified as part of the return on quality, present these benefits as intangible factors to help justify the improvement program
- Calculate the return on investment form improvement (Cost of poor quality, savings, increases in sales revenue vs. cost of the improvement initiative)
- Use a successful case history in the organization to justify a broader program (pilot or historic projects, the process and the outcome to be an example of success)

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6 sigma