Modular *kaizen* Concepts

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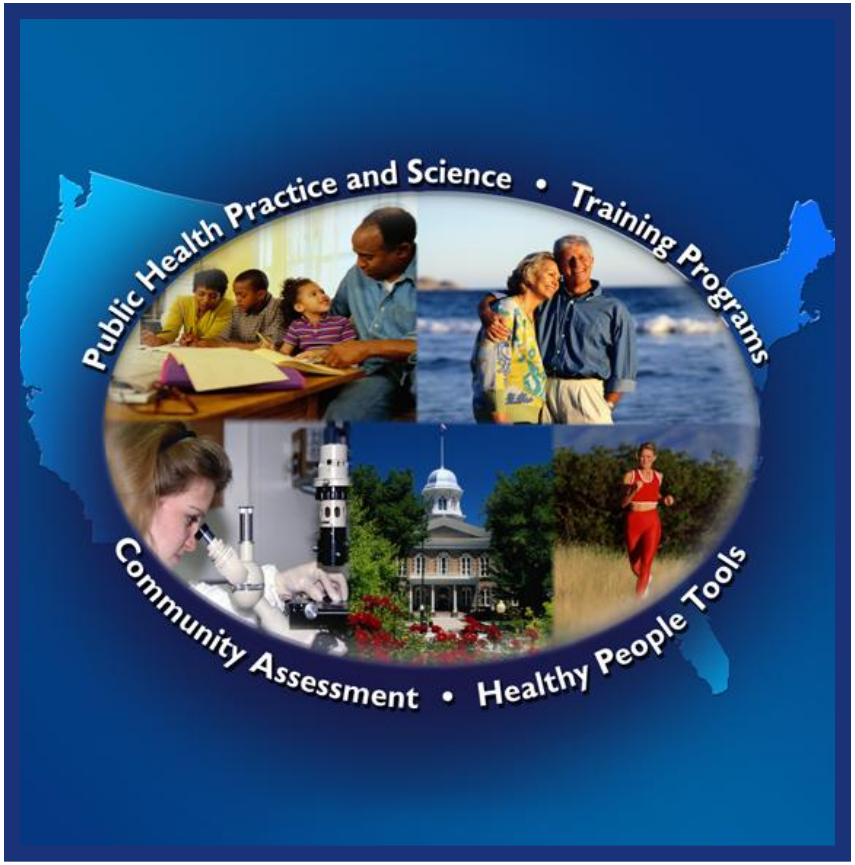

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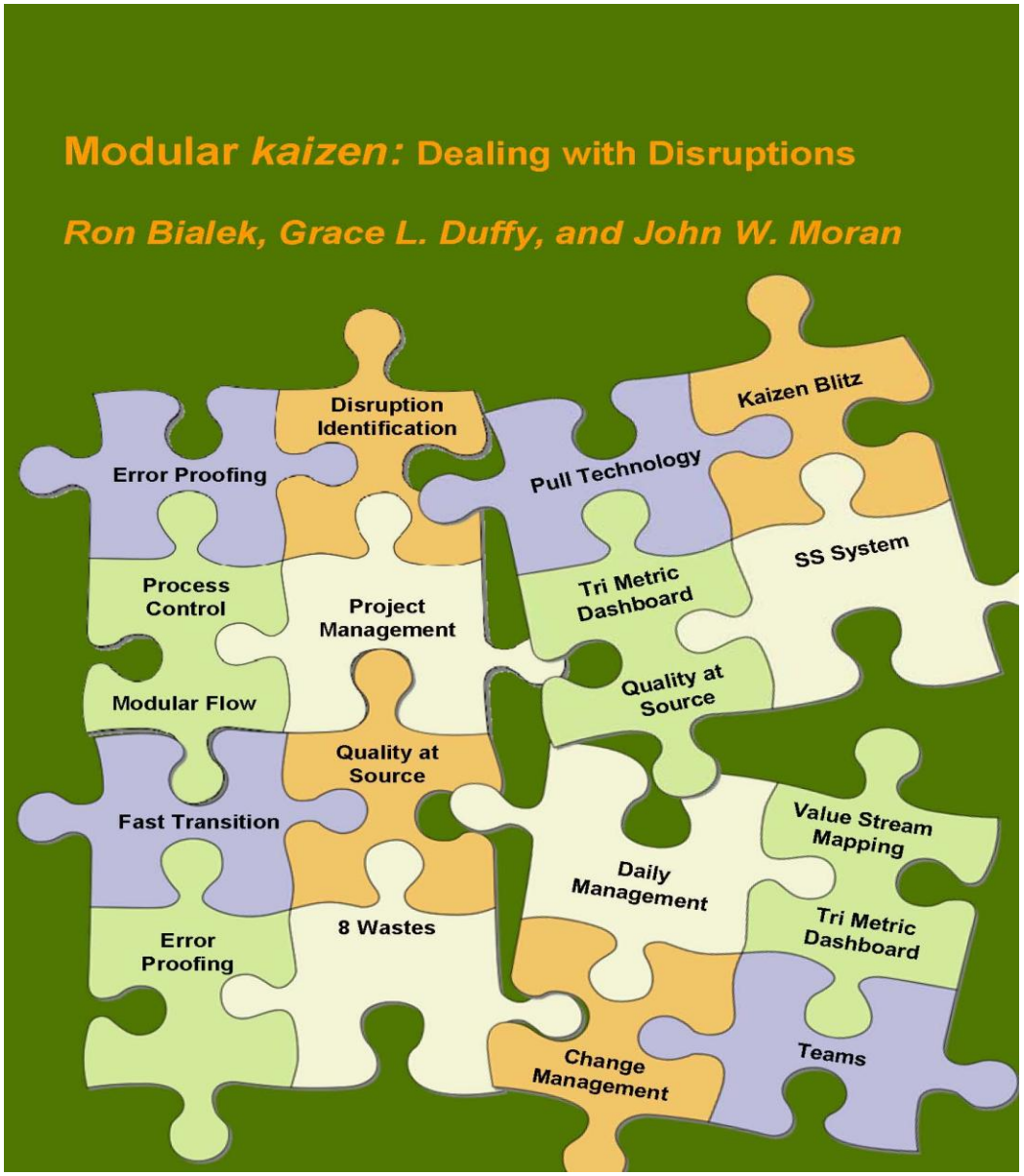


Purpose

- Designed to help health departments in disruptive environments
- Improve processes
- Greater efficiency, effectiveness, transparency, and accountability
- Build on proven practices
- Enhance the power of quality and process improvement

Introductory Session

- Kaizen (pronounced ki-zen) is a Japanese word constructed from two characters:
  - **“Kai” - change**
  - **Zen” - goodness or virtue**
- Kaizen is commonly used to indicate the long-term betterment of a process (continuous improvement) – re-orient a process

Introductory Session

- Modular *kaizen* is a process to address the need for continuous improvement within Public Health's highly interruptive environment.

- Modular *kaizen* is a modification of the traditional Kaizen improvement process designed to provide the same rapid results without removing critical personnel from daily operations until needed.

- All the components of an effective kaizen event are planned; however, the activities are scheduled in small chunks that fit the rapidly changing calendar of team members and subject matter experts.

Introductory Session

- The opposite of Kaizen Blitz. Rather than getting everyone into a room until the solution is developed, Modular *kaizen* is conducted over a series of short activities designed to fit into a highly interrupt driven work environment.

- This approach is complimentary to both PDCA and DMAIC models of quality improvement.

Introductory Session

- The Modular *kaizen* approach minimizes disruption by making sure no ***"action"*** is executed until ***"check"*** has been done and data have been analyzed to identify the reality of the current situation.

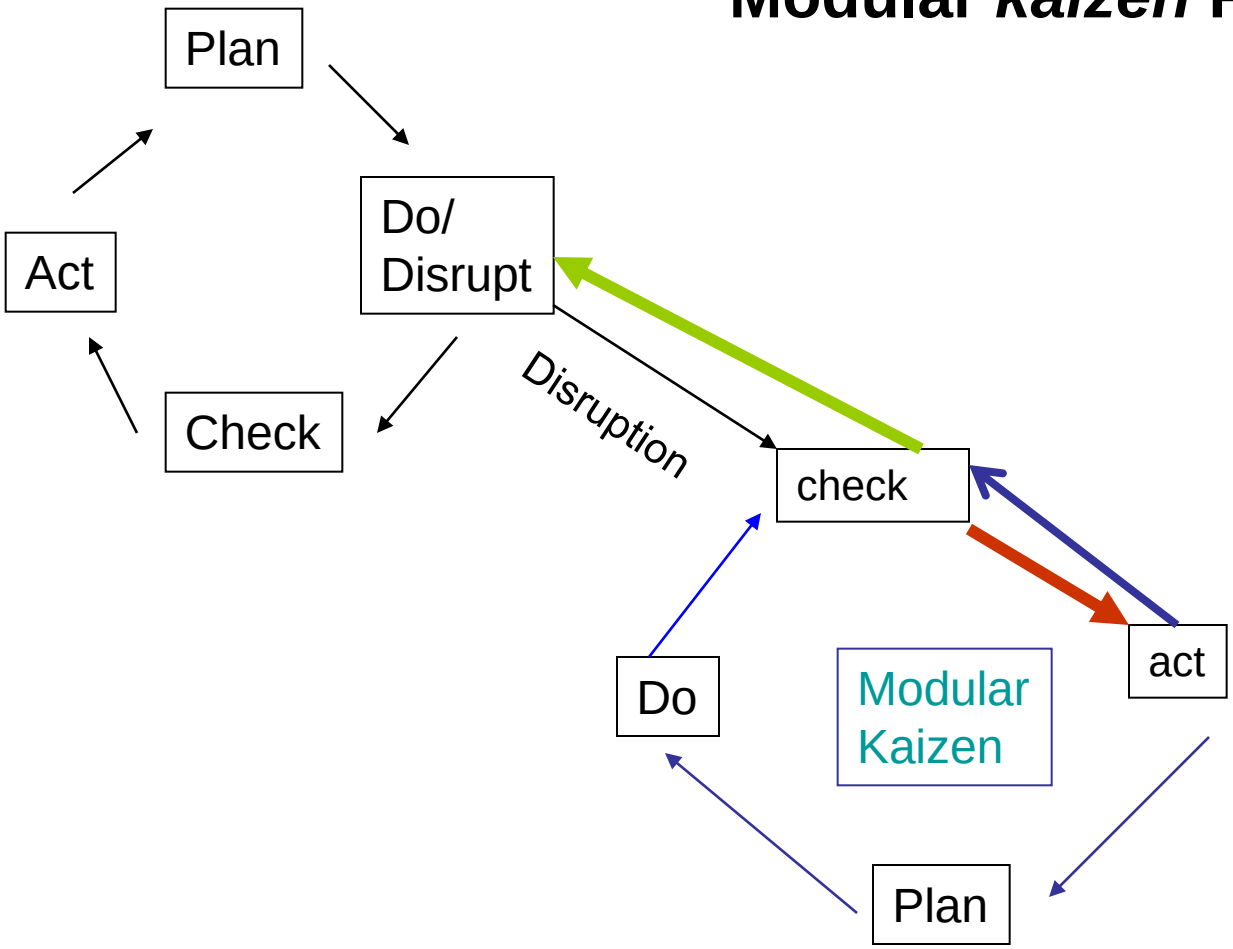
- Modular *kaizen* is an approach that resists the urge to respond to a disruption with panic. Once the process is stabilized, a full PDCA cycle is undertaken to develop a plan and action steps to proactively minimize the recurrence of the disruption.

Introductory Session

- The participants in this session will be exposed to the Modular *kaizen* model of c-a-P-D cycle and the tools most commonly utilized:
  - Impact and Disruption Matrix
  - Force and Effect+ca Diagram (Disruption and Impact Diagram)
  - House of Modular *kaizen*
  - SIPOC+CM Diagram

Introduction To Modular *kaizen Concepts*

Modular *kaizen* Flow



Check

- Investigate and understand the disruption
- Is it Special Cause?
- Document the severity/urgency
- Who/What impacted?
- Estimate the length of the disruption – timeline
- Use the Limited Information Collection Principal to guide data collection

Act

- Based on the data gathered in Check:
  - Do nothing – continue to monitor the disruption
  - Investigate - establish an investigative team to dig deeper into the disruption and report back – high level scope
  - Respond - apply all available resources to the disruption to solve it and bring it under control using the PDCA Cycle

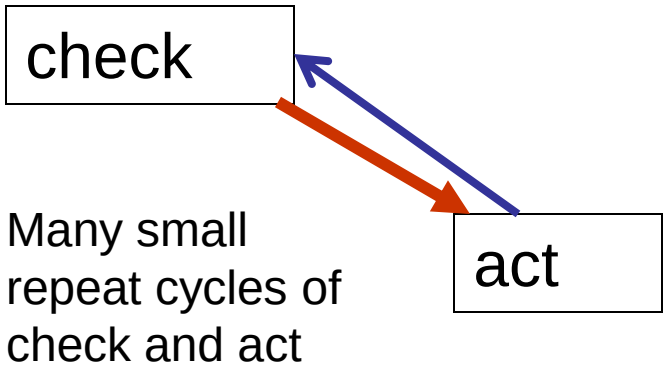
Check

- Evaluate and determine when disruption is under control and resources can be returned to departments to resume regular activities – **Green light**
  - Document lessons learned, knowledge gained, and any surprising results that emerged
  - Monitor and hold the gains

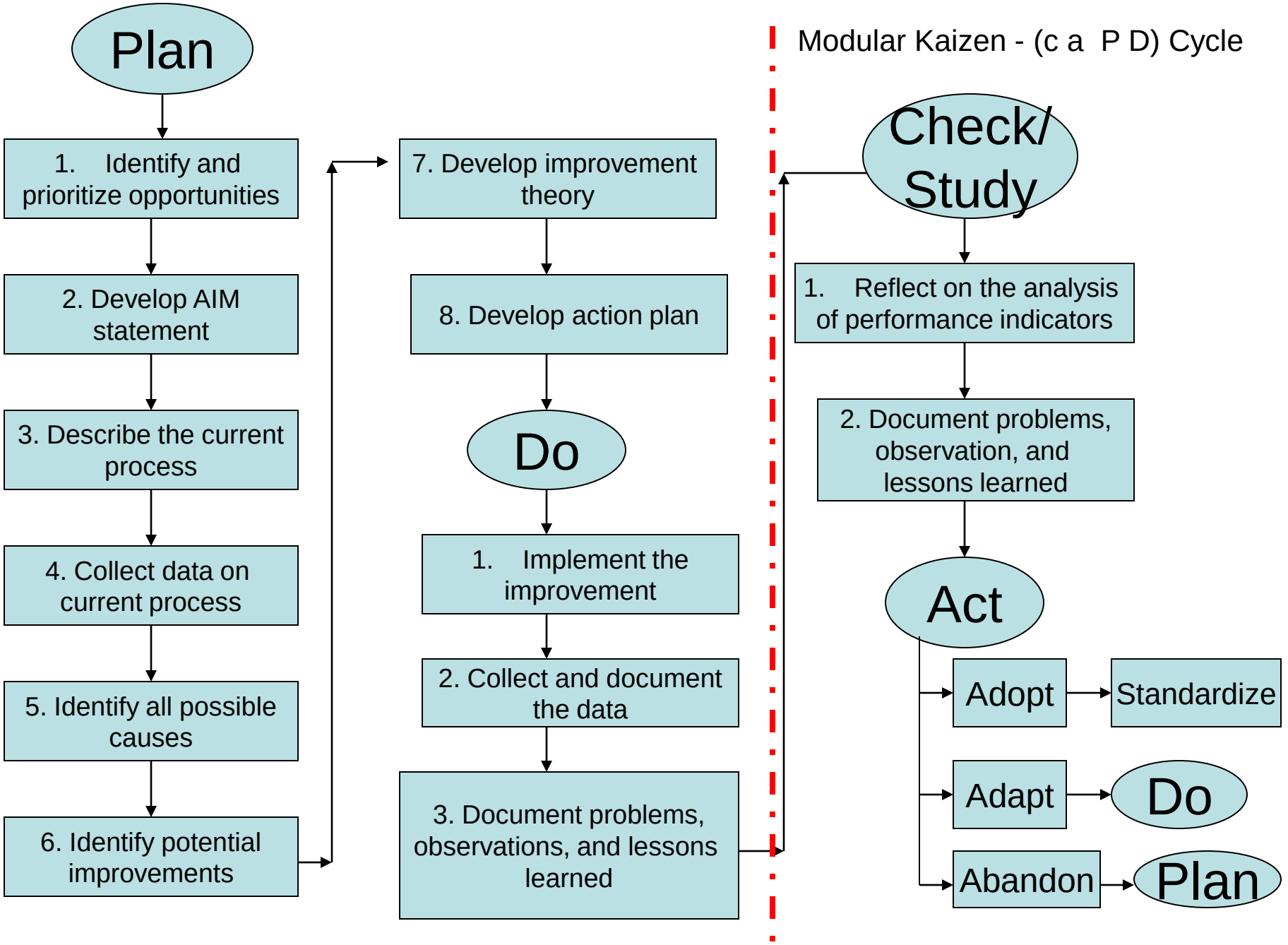
Act

Red light

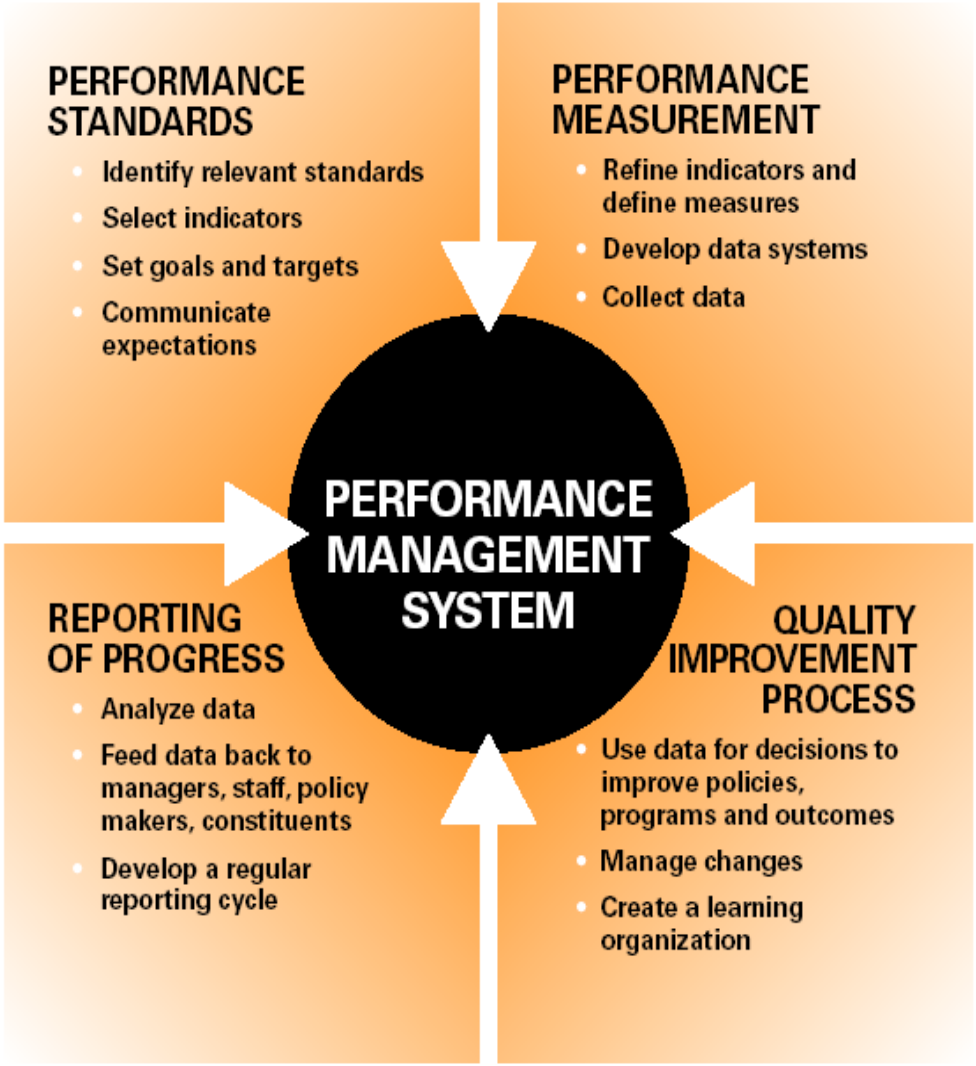
- If disruption is not under control repeat the Act/Plan/Do phase to make improvements
- Take action using the PDCA cycle



No act is executed until check has been done

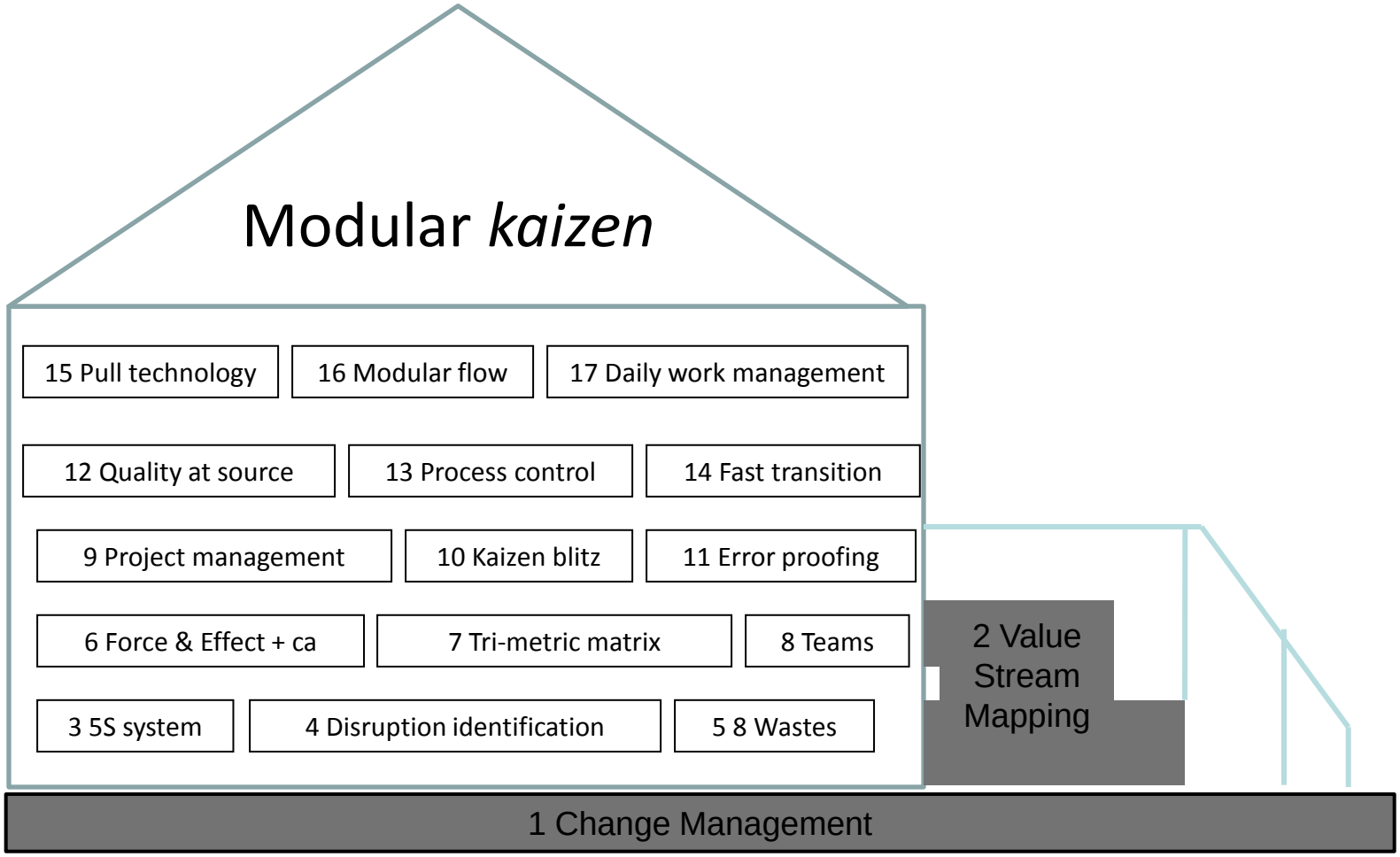


Source: The ABC's of PDCA, G. Gorenflo and J. Moran - http://www.phf.org/pmqi/resources.htm#ABCs_of_PDCA



Source: From Silos to Systems: Using Performance Management to Improve Public Health Systems – prepared by the Public Health Foundation for the Performance Management National Excellence Collaborative, 2003

The House of Modular *kaizen*



Tour of the House of Modular *kaizen*

1. Change Management
2. Value Stream Mapping
3. 5 S System
   - Sort
   - Set in order
   - Shine
   - Standardize
   - Sustain
4. Disruption Identification
5. Eight Lean Wastes

Definition of 8 Types of Waste:

Waste	Description	Public Health Example
Over-production	Items being produced in excess quantity and products being made before the customer needs them	Insurance filing or immunization record opened before all required information is received
Waiting	Periods of inactivity in a downstream process that occurs because an upstream activity does not produce or deliver on time.	Paperwork waiting for management signature or review
Unnecessary Motion	Extra steps taken by employees and equipment to accommodate inefficient process layouts.	Immunology testing equipment stored in cabinets far from specialist work area.
Transportation Handling	Unnecessary movement of materials or double handling	Department vehicles stored in central facility, requiring constant movement of vehicles to and from other high traffic locations
Over-processing	Spending more time than necessary to produce the product or service	Combining client survey instruments into one form rather than develop specific instruments for each program
Unnecessary Inventory	Any excess inventory that is not directly required for the current client's order	Over estimating vaccination support materials requiring additional locked storage cages, inventory counting and reconciliation
Defects	Errors produced during a service transaction or while developing a product.	Ineffective scripts for initial intake applications. Unclear directions for filling out required forms
Duplication	Having to re-enter data or repeat details on forms.	Poorly designed client intake computer screens or services checklists

Tour of the House of Modular *kaizen*

6. Force & Effect+ca

7. Tri-Metric Dashboard

8. Teams

9. Project Management

10. Kaizen Blitz

11. Error Proofing

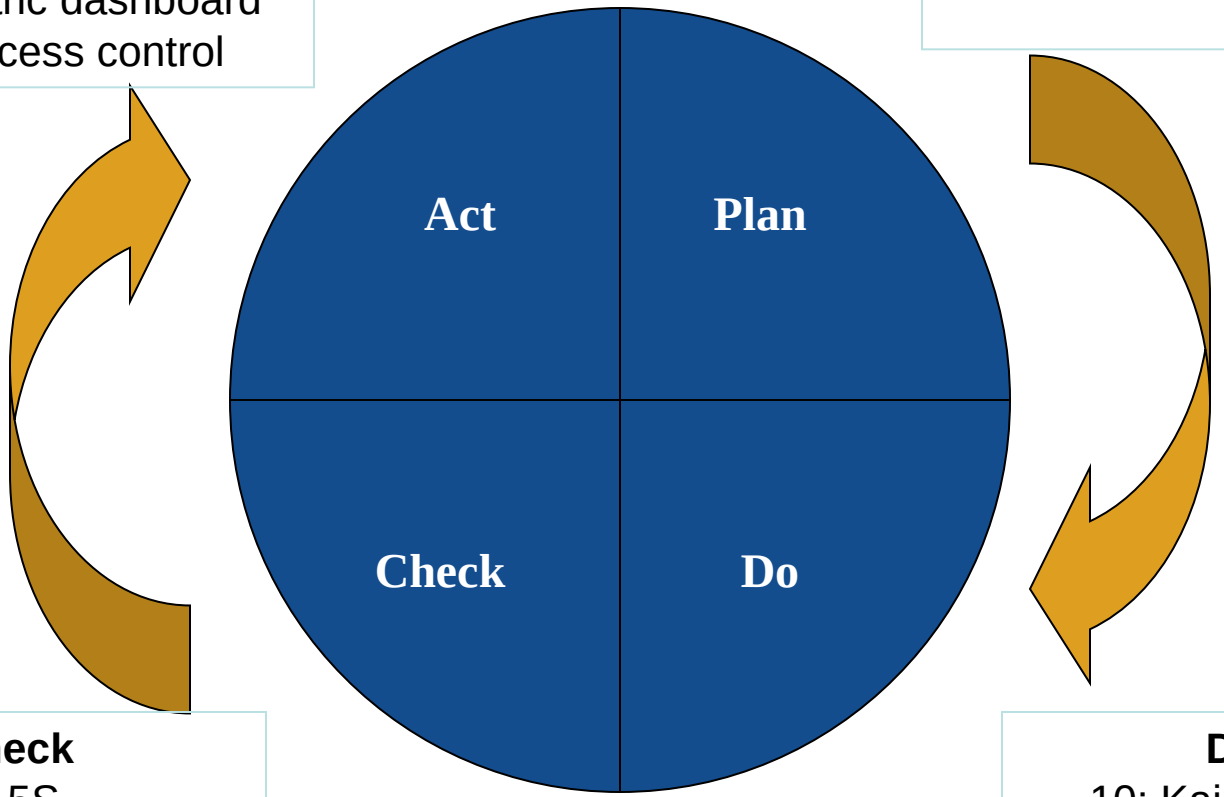
Tour of the House of Modular *kaizen*

12. Quality at the Source
13. Process Control
14. Fast Transition
15. Pull Technology
16. Modular Flow
17. Daily Work Management

PDCA: Use of the Modular *kaizen* basic tools

Act
7: Tri-metric dashboard
13: Process control

Plan
2: Value stream mapping
4: Disruption identification
7: Tri-metric matrix
13: Process control

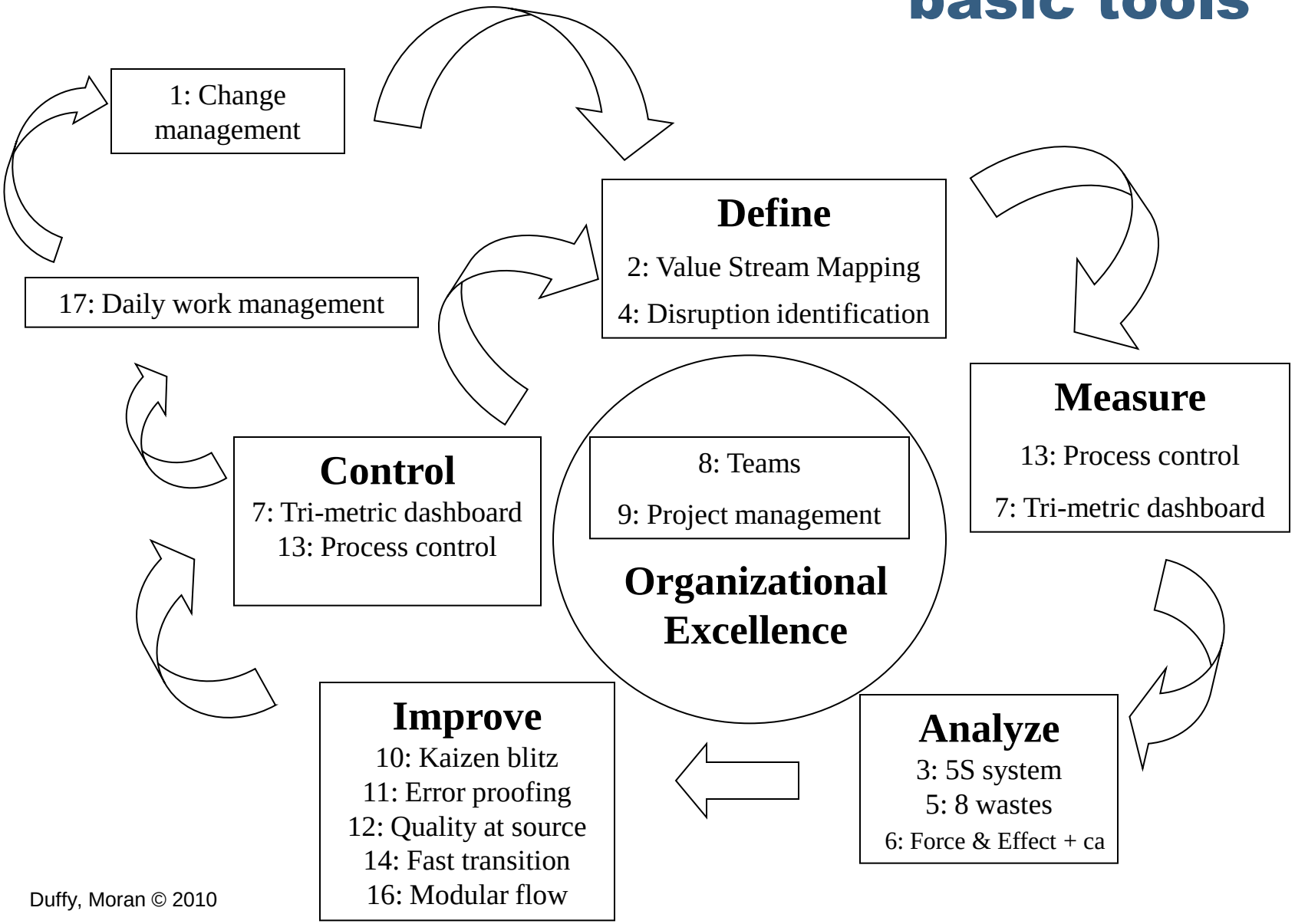


Check
3: 5S
5: 8-Wastes
6: Force & Effect + ca
7: Tri-metric dashboard
13: Process control

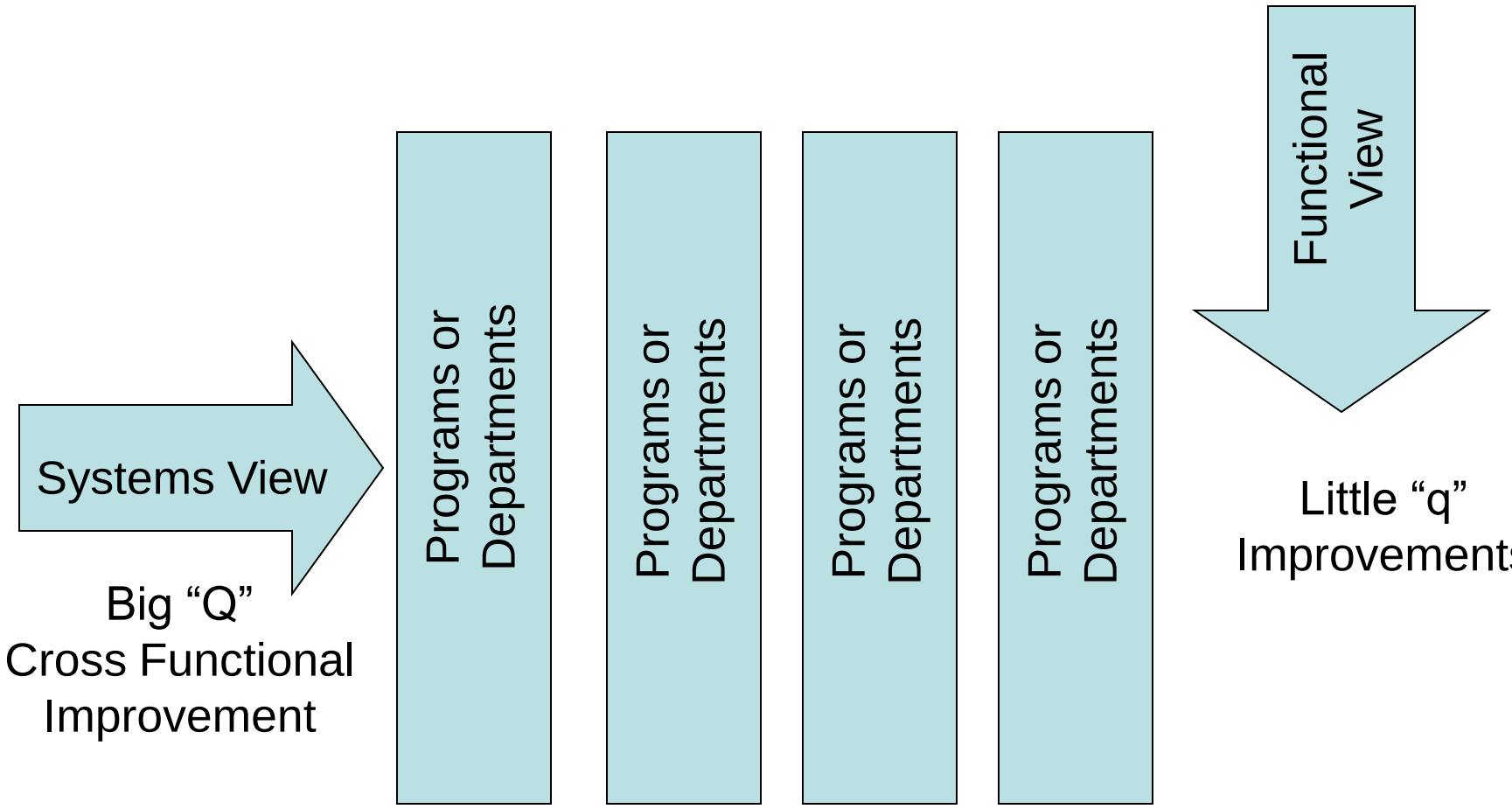
Structure
1: Change management
8: Teams
9: Project management
17: Daily work management

Do
10: Kaizen blitz
11: Error proofing
12: Quality at source
14: Fast transition
16: Modular flow

DMAIC: Use of the Modular *kaizen* basic tools

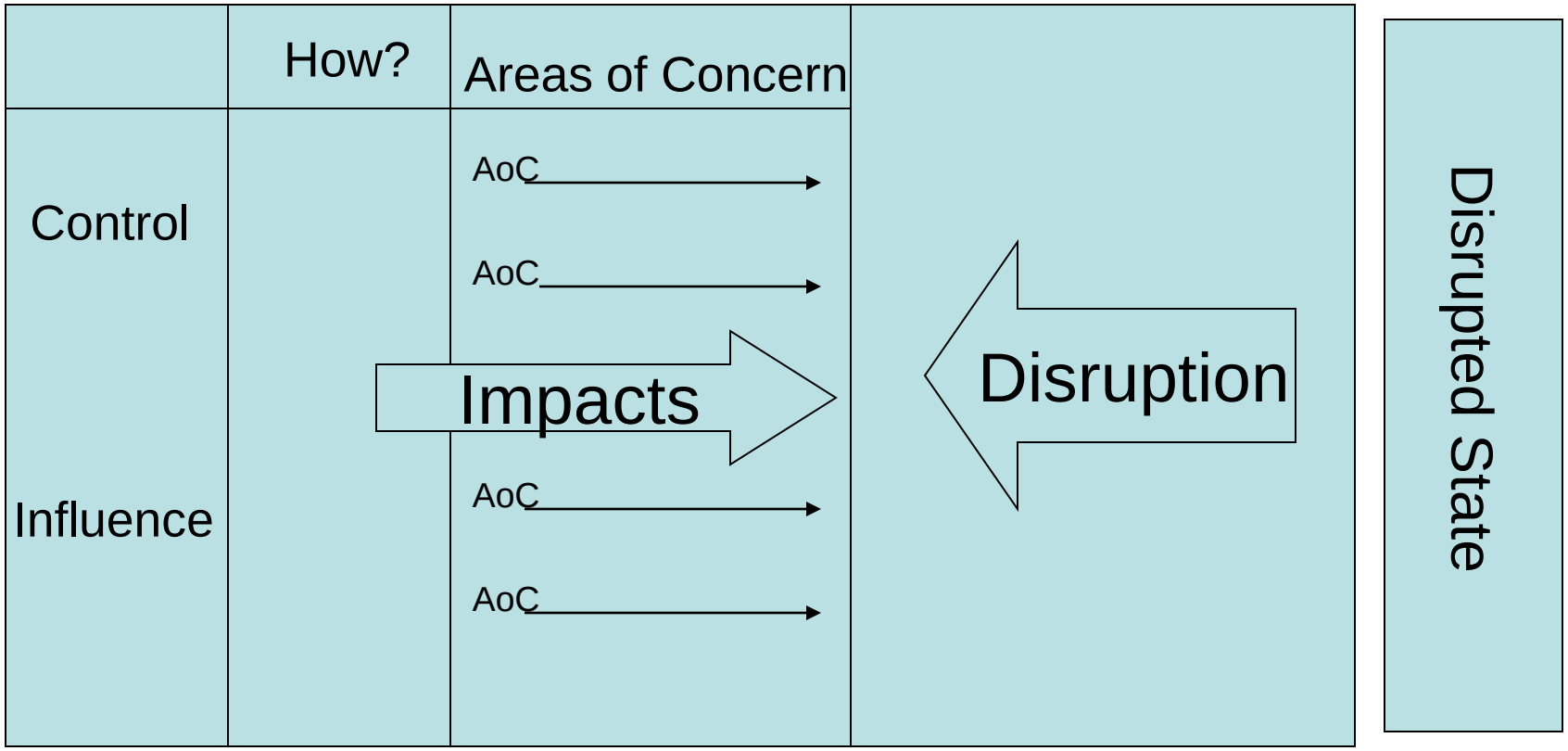


Systems View of the Disruption

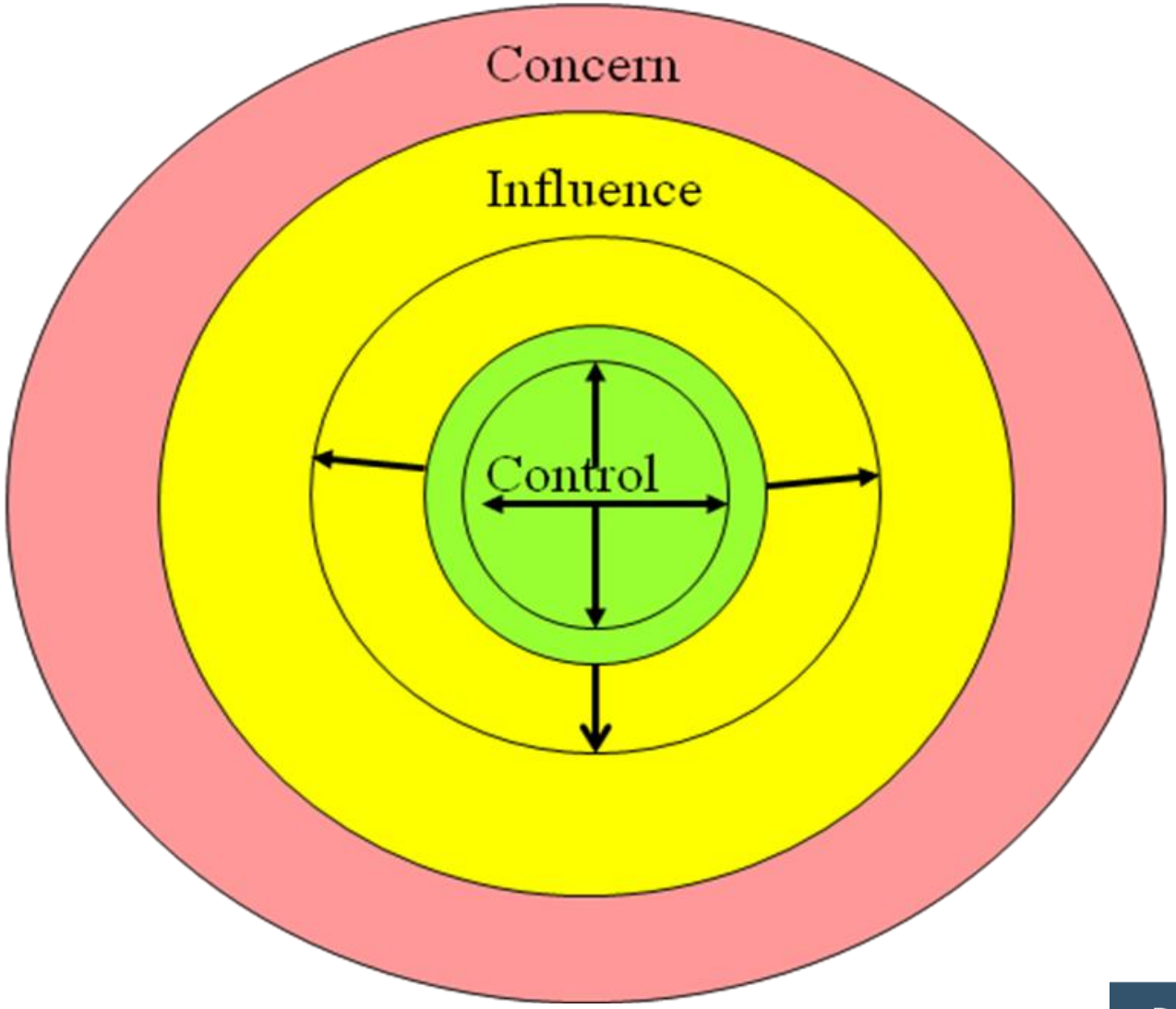

Systems View
Big “Q”
Cross Functional
Improvement
Programs or Departments
Programs or Departments
Programs or Departments
Programs or Departments
Functional View
Little “q”
Improvements

Disruption and Impact Matrix

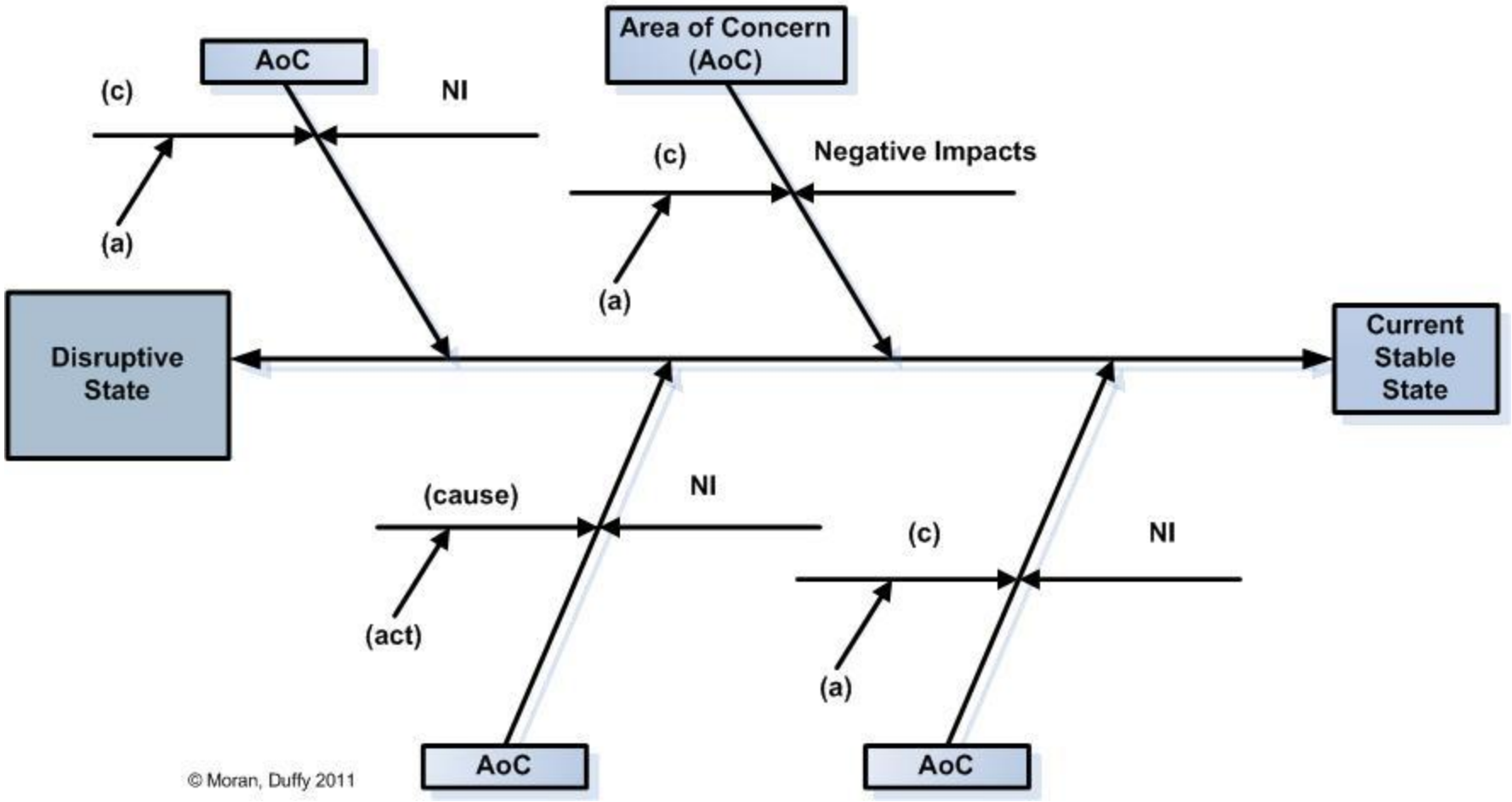
Disruption: _____ Date: _____

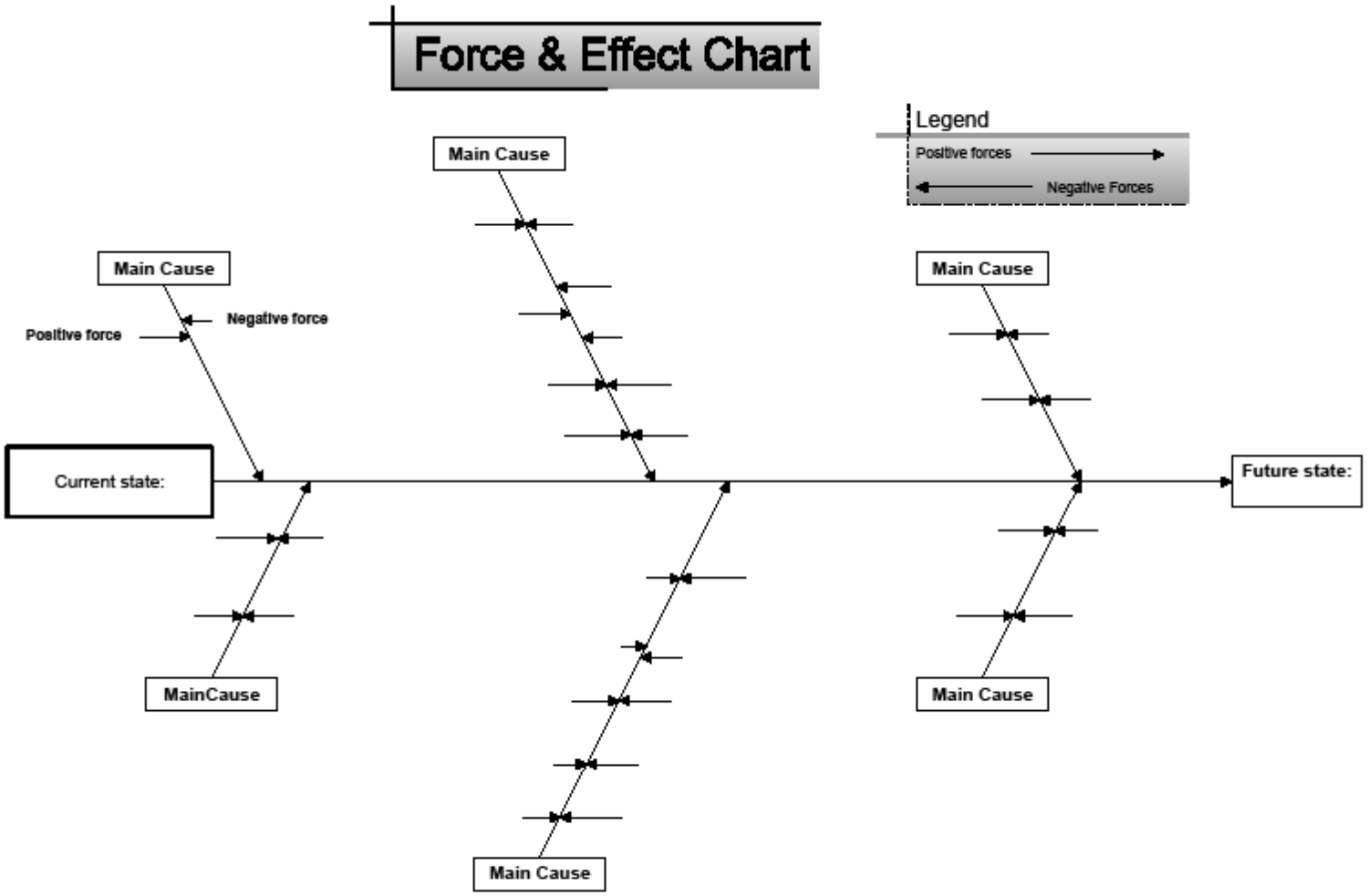


Current State


Concern
Influence
Control

Force & Effect + (c)(a) Chart

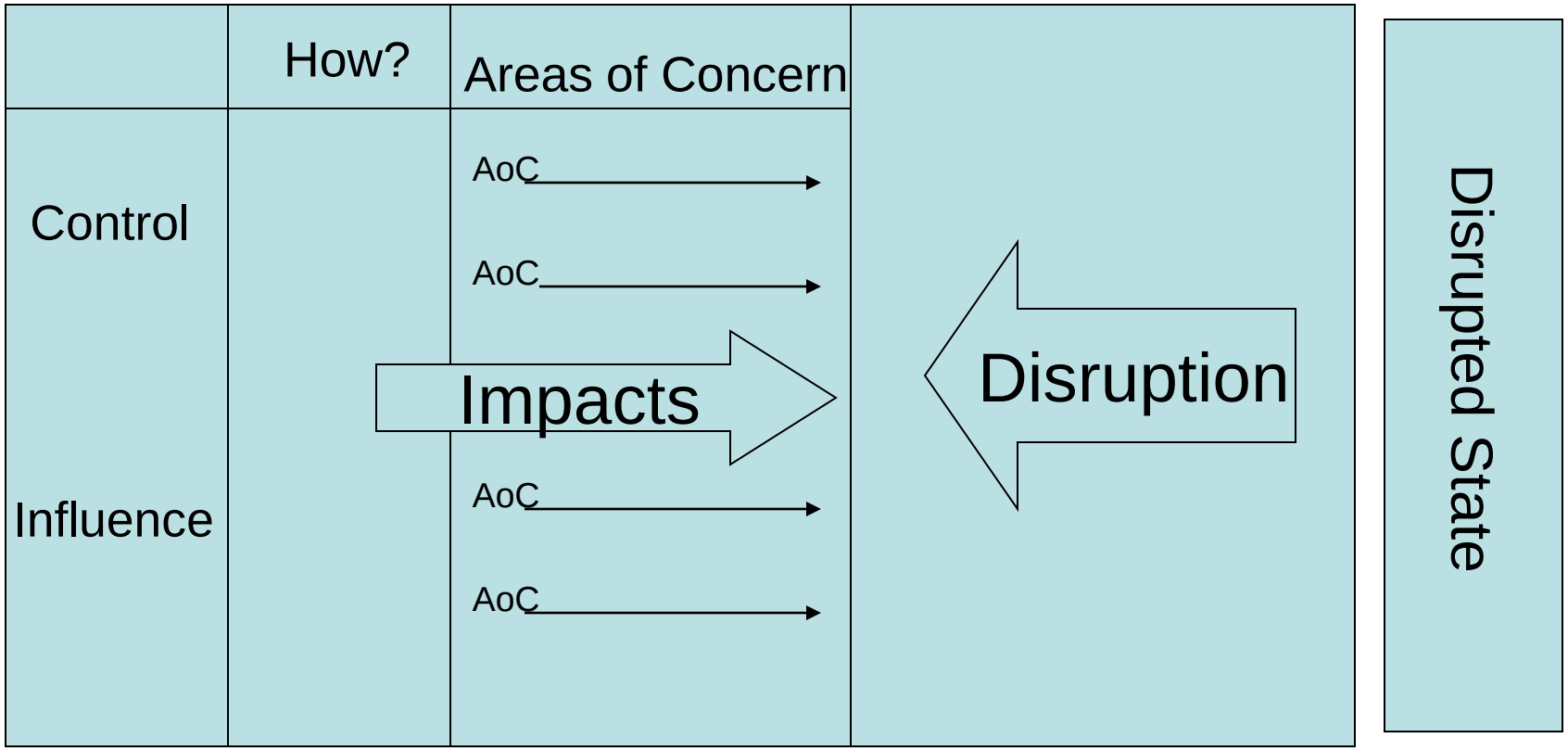




Force and Effect Chart Guides Team Through Addressing Barriers, J. Moran and G. Duffy, August 2010, Six Sigma IQ, UK , http://www.sixsigmaiq.com/article.cfm?externalID=2978

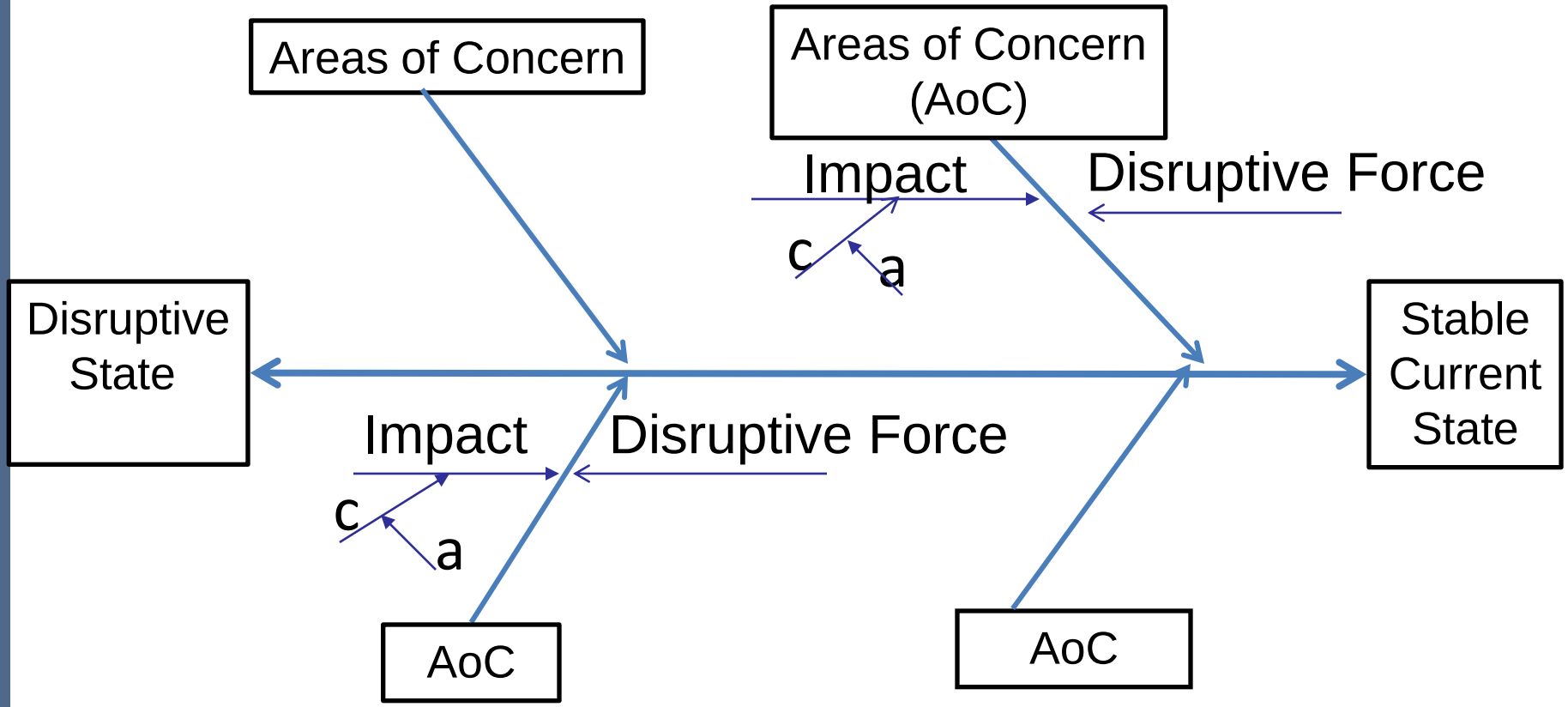
Disruption and Impact Matrix

Disruption: _____ Date: _____

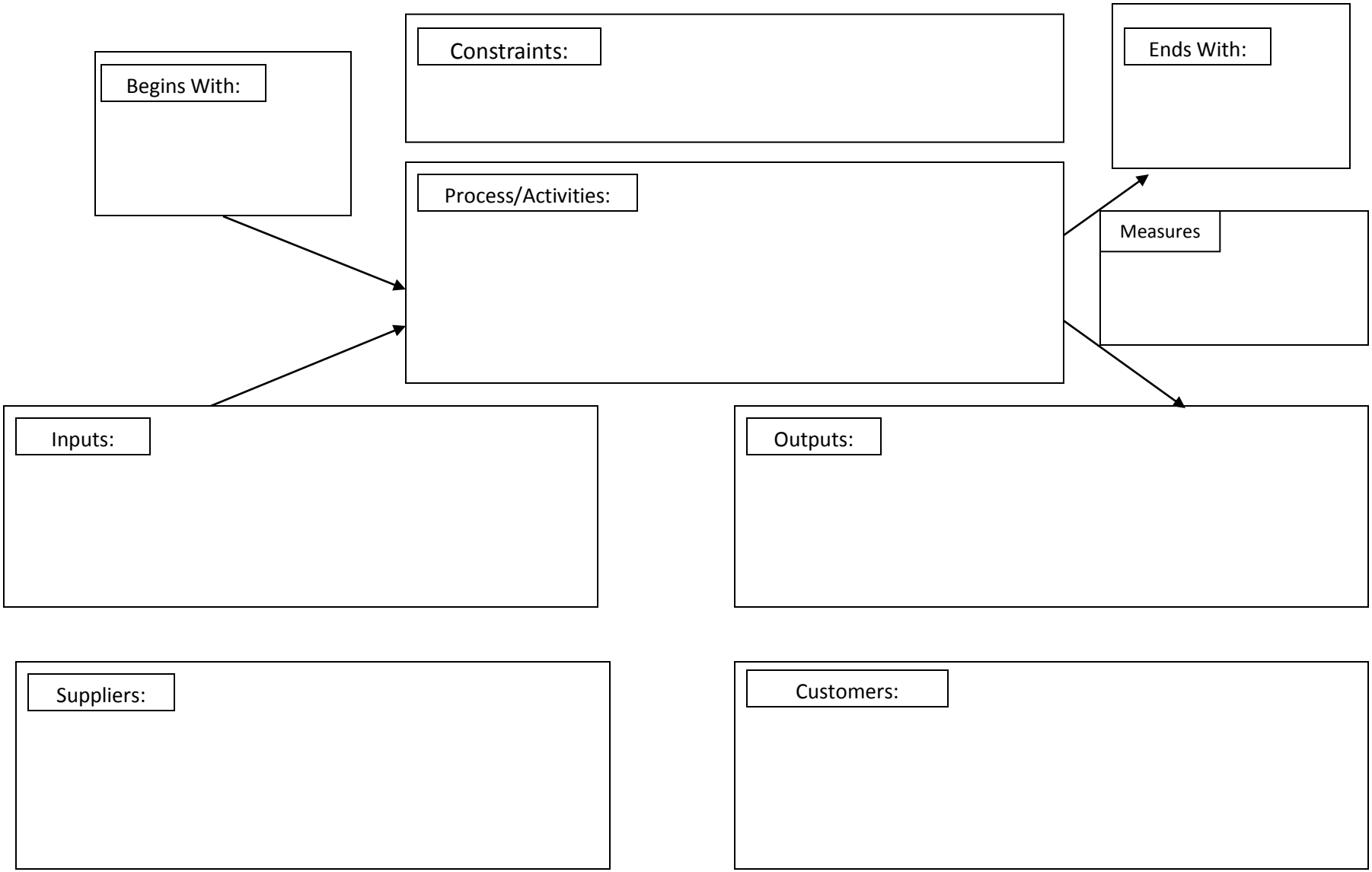


Current State

Disruption and Impact Diagram

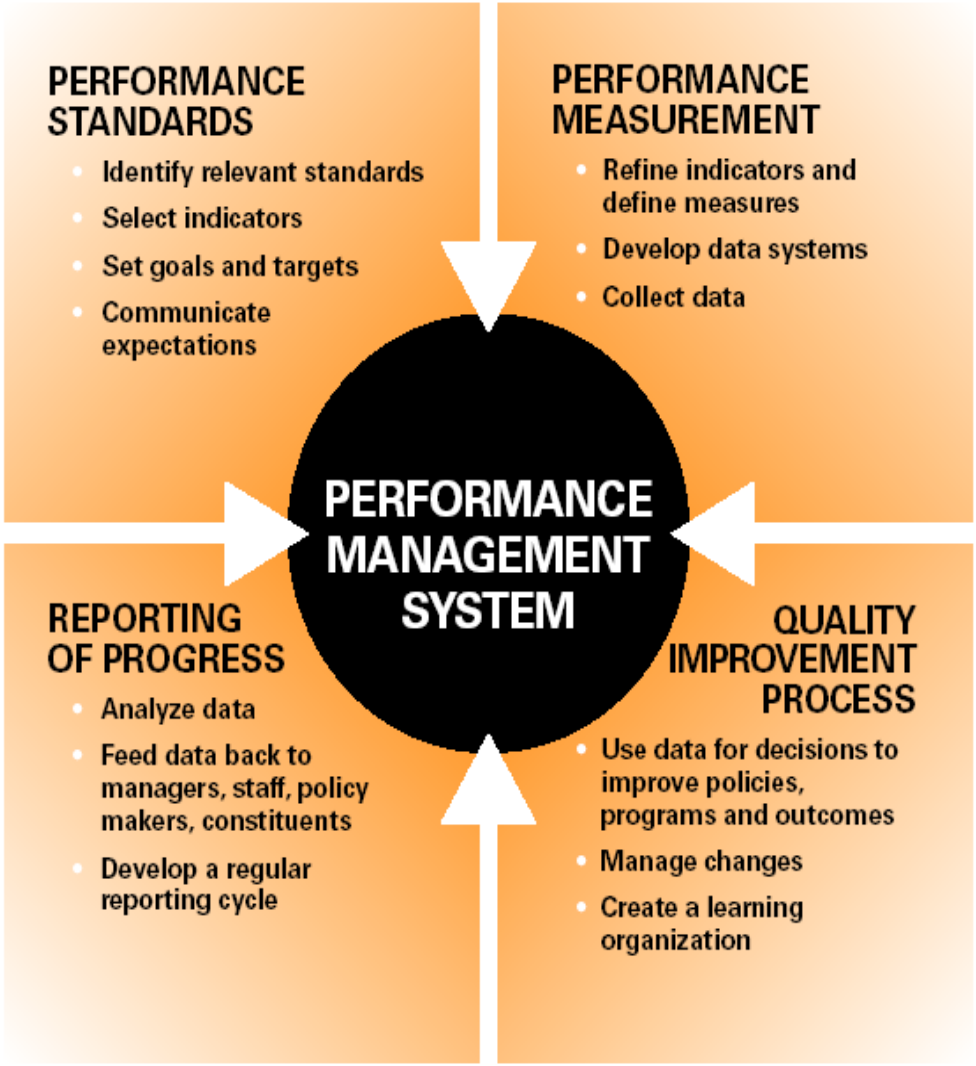


S I P O C + CM Form



Modular *kaizen* Case Study

Measurement



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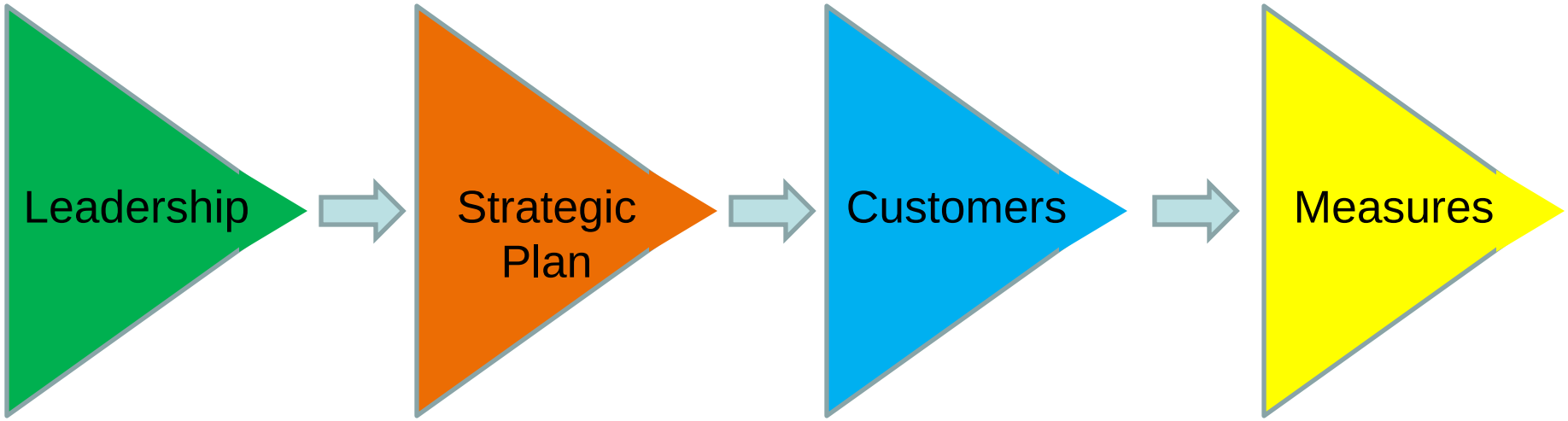
Tri Metric Matrix

- A tool which guides an improvement team through the steps of identifying capacity requirements, process expectations, and outcomes for a product or service.

- The value of this tool is more than a checklist for filling in customer or process requirements.

- This tool prompts the improvement team to interact with customers, suppliers, subject matter experts, and each other to understand enough about the overall process to control it effectively.

Focus effective performance measures through alignment to organizational objectives

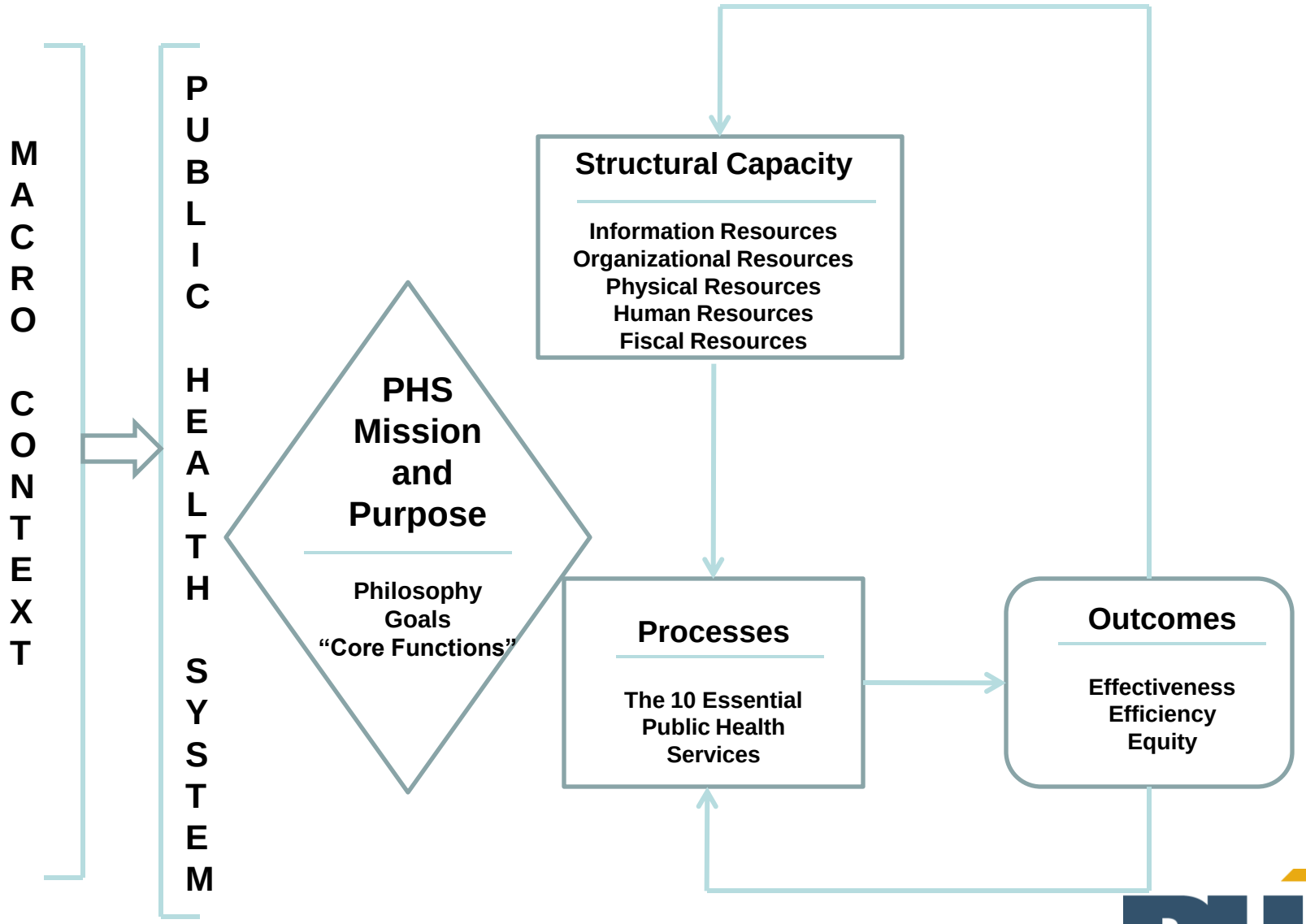


- S - Skills/Style
- W – Risks
- O – Opportunity
- T – Barriers (Individual)

- Organization Design
- Infrastructure
- High Level Process Map
- Org. Level SWOT

- Needs/Profiles
- Direct interviews
- Best practices
- Complaints
- Industry research
- Competitive analysis
- QFD

- Key Performance Indicators
- Regulations/Standards
- Outcomes
- Outputs
- Interim milestones
- Monitor & control


MACRO CONTEXT
PUBLIC HEALTH SYSTEM
PHS Mission and Purpose
Philosophy
Goals
"Core Functions"
Structural Capacity
Information Resources
Organizational Resources
Physical Resources
Human Resources
Fiscal Resources
Processes
The 10 Essential Public Health Services
Outcomes
Effectiveness
Efficiency
Equity

Key Process Indicators (KPI)

- The following areas are some guidelines for potential major KPIs.
  - *Effectiveness*—Does the process output conform to stated requirements? Goal: Doing the right things.
  - *Efficiency*—Does the process produce the required output at minimum resource cost? Goal: Doing the right things well.
  - *Quality*—Does the output meet customer requirements and expectations?
  - *Timeliness*—Does the process produce its output correctly and on time?
  - *Productivity*—How well does the process use its inputs to produce its output? Goal: Establish the ratio of the amount of output per unit of input.
  - *Output* —How much does the process produce in a given time period?
- Depending on the process in place, the KPI may be a combination of the above. It is desirable to have proactive measures that show what is happening now in the process rather than reactive measures that show what has happened. Whatever measures are decided upon should give a clear indication of how the process is operating and should indicate when action must be taken.

Tri Metric	Indicator	Definition	Baseline	Improvement Target
1. Capacity				
2. Process				
3. Outcome				

Capacity Measures

- The capacity of a process is defined as an output measure which is a measure of activity.
- Sometimes this is referred to as the maximum output rate measured in terms of some type of units provided per period of time.
- Sometimes it is useful to understand activity measures which describe the level of resources committed to a process.
- Just knowing these three measures does little to help us understand how the process is satisfying our customers.
- Process and output measures help us understand the capability of the process to meet customer needs.

Process Measures

- Descriptors of how the process is performing in its current state. It is very important to understand how the current state is operating and define the baseline before attempting any type of improvement activities.
- It is important not to change a process before understanding where it is centered or the amount of variation that is present.
- The most common measures of a process are the mean and the standard deviation.
- Once those measures have been calculated, conducting a capability study which measures the number of standard deviations between the process mean and the nearest specification limit in sigma units can occur.

Process Measures

- In general, as a process's standard deviation rises, or the mean of the process moves away from the center of the tolerance:
  - fewer standard deviations will fit between the mean and the nearest specification limit
  - an increased likelihood of items outside specification will occur

Process Measures

- The two indices used in defining process capability are:
  - Cp - Measures the variation - how well the data fits within the specification limits (USL, LSL) - width of the process distribution relative to a set of limits
  - Cpk - Measures the central tendency – it is an index which measures how close a process is running to its specification limits and how centered the data is between the specification limits

The larger the index, the less likely it is that any item will be outside the specifications.

Specifications

- In service industries, healthcare, and public health, many processes do not have defined specifications. For processes without defined specifications, it is important to develop limits with the customers of the process variation that they will *tolerate*.

- Do we have specifications in Public Health?

Specifications

- The authors propose developing an ***Upper Toleration Limit (UTL) and Lower Toleration Limit (LTL)*** to allow use of either Run Charts or Control Charts.

- The questions to ask a customer might be “How long are you willing to wait for the doctor, for a flu shot, to get service in a WIC clinic, or to get a meal at a fast food restaurant?”

Tri Metric	Indicator	Definition	Baseline	Improvement Target
2. Process	Mean	Mathematical average of a set of numbers.	μ = 10 minutes	μ = 8 minutes
	Standard Deviation	Measurement of variability or the square root of the variance	σ = 2 minutes	σ = 1.5 minutes
	Cp	How well the data fits within the spec limits (USL, LSL)	Cp = 2.0	Cp = 1.6
	Cpk	How centered the data is between the spec limits	Cpk = 1.5	Cpk = 1.0

Outcome Measures

- The result of a process output. An outcome measure is used to measure the success of a process. For most processes, an AIM statement is developed to focus what the process is supposed to accomplish and by when. Examples of outcome measures are:
  - Achieving a Press Ganey score for patient satisfaction of 99%
  - Reducing hemoglobin A1c (HbA1c) to less than 7 for patients with diabetes
  - Healthcare acquired adverse event - > 3 Surgical site infection
  - 300 accident-free days
  - 98% TB completion of therapy
  - 97% Medicaid billing success rates
  - 100% HIV regimen compliance
  - < 5% Tobacco use by middle and high school students
  - < 8 minutes clinic waiting time

Tri Metric	Indicator	Definition	Baseline	Improvement Target
3. Outcome	Customer Satisfaction	% satisfied customer	98% score	99% score
	Accident free days	# accident-free days	300 days	350 days
	TB completion of therapy	Patients completing therapy successfully	75%	95%

Tri Metric Matrix: Power Outage

Tri Metric	Indicator	Definition	Baseline	Improvement Target
1. Capacity: electrical	# Amperage/ Volts	Amount of power available to service equipment needs	Standard output of normal hospital requirement at full patient load	Supplemental capacity available through hospital connections to alternate power sources
2. Capacity: patient care	•% Coverage •Cycle time to meet requirements	All patient needs adequately covered, rescheduled or transferred to alternate care provider	Standard, documented hospital performance management service levels	Checklist in place and rehearsed for anticipated disruptions to normal service delivery environment
3. Process	% milestones complete % deadlines met	Meet or exceed process interim deliverables and outcomes	Documented objectives, process measures, specified outcomes	Continuous improvement to process outcomes, including cycle times and service levels. Documentation updated and published
4. Outcome: Satisfaction	% "top box" patient % "top box" staff	Percent of patient and staff satisfaction rated as "very satisfied"	Compared to national hospital survey data of patient, staff ratings	Attain greater than 80% responses above 75% percentile ranking of national survey data
5. Outcome: Service level	% critical patient care completed to requirements	Amount of critical and non-elective patient care delivered on time and within standards	Using industry accepted, documented medical and audit requirements	Increase ability to provide non-critical care at defined service level

Tri Metric Matrix Template

Tri Metric	Indicator	Definition	Baseline	Improvement Target
1. Capacity				
2. Process				
3. Outcome				

Measurement

- Measurement is the key to having processes that successfully deliver customer satisfaction.

- Measuring capacity, process, and outcomes gives three critical perspectives to the overall performance of a process.

Changing Behavior

- Changing the behavior of the members of an organization can basically be done in one of two ways.

- You can force behavior change through micro management and pressure, or you can change the mindsets of the members of the organization so that their thinking results in the behavior required to sustain change.

Changing Behavior

- Mindsets are developed over time and they are the unwritten (and often unspoken) rules that influence behavior.

- What is important to understand is that leaders create the unwritten rules by their **behaviors**, which may or may not be consistent with the expectations they communicate.

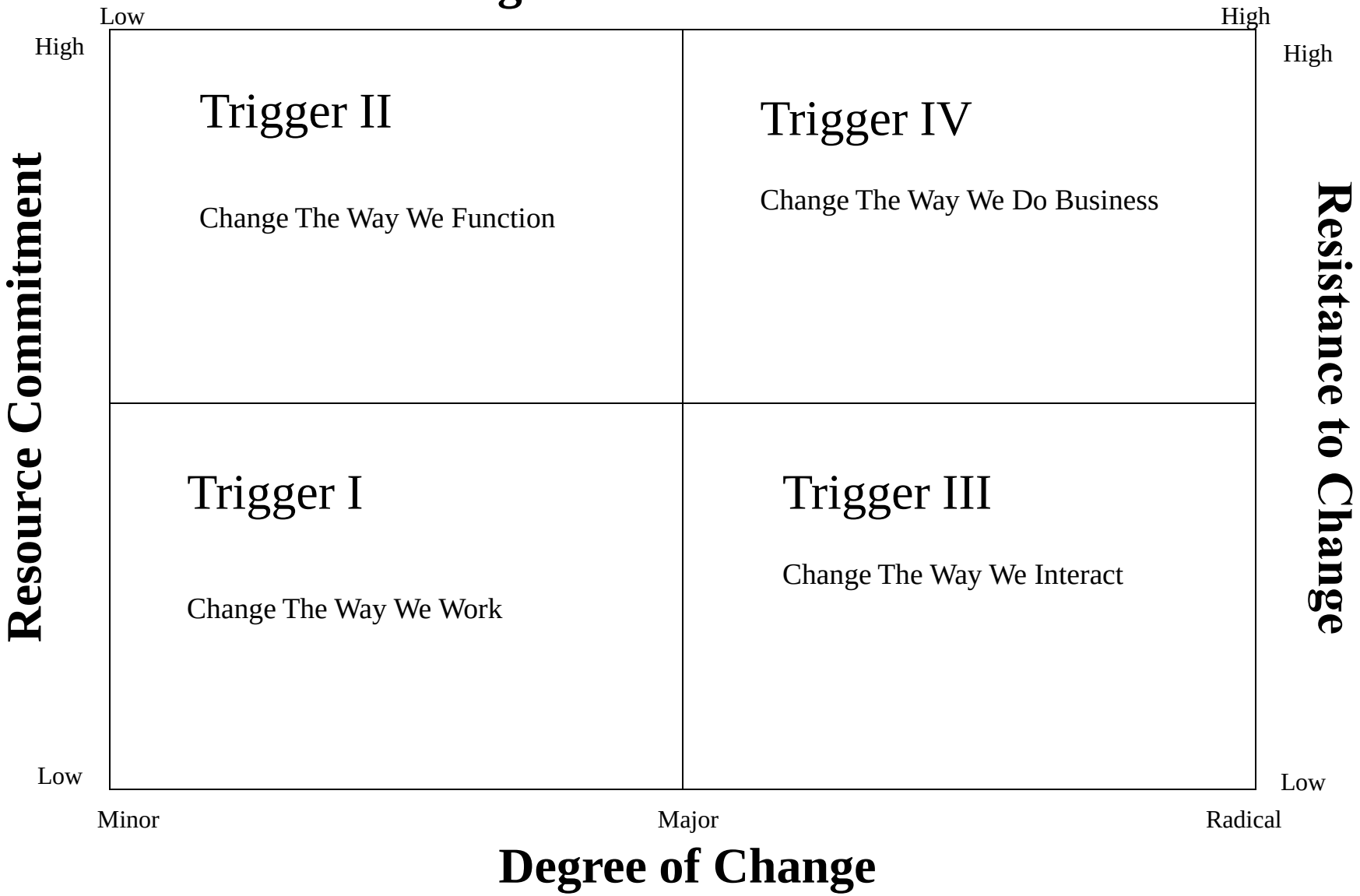
- Edgar Schein is the author of *Organizational Culture and Leadership*. In his book, he writes about changing culture and mindset through embedding mechanisms.

Changing Behavior

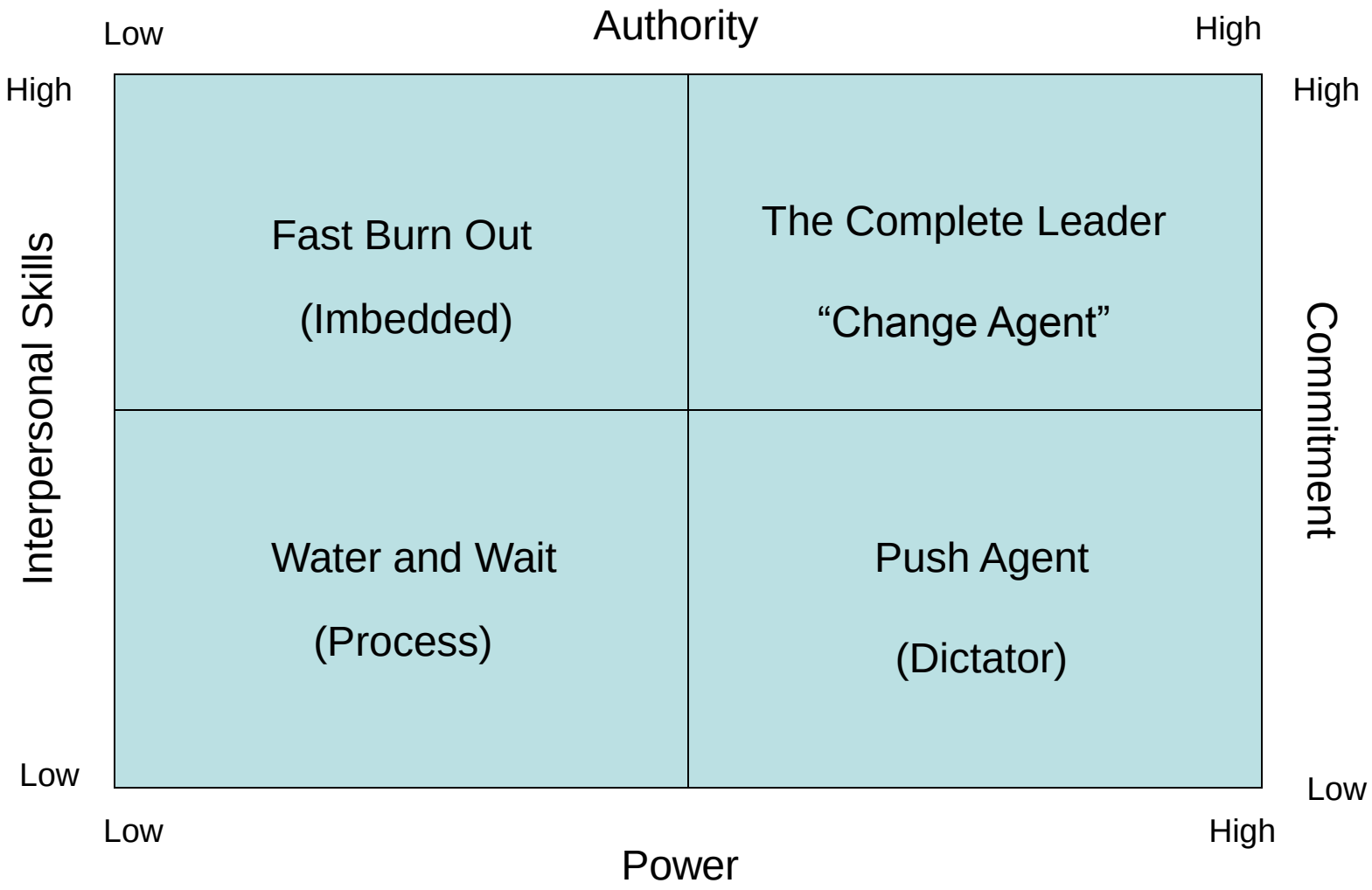
- The most important thing to understand about mindset and culture change is that it will not come from a change in the organizational chart or posters on the wall.

- Mindset and culture change will only come from a change in leaders' behavior.

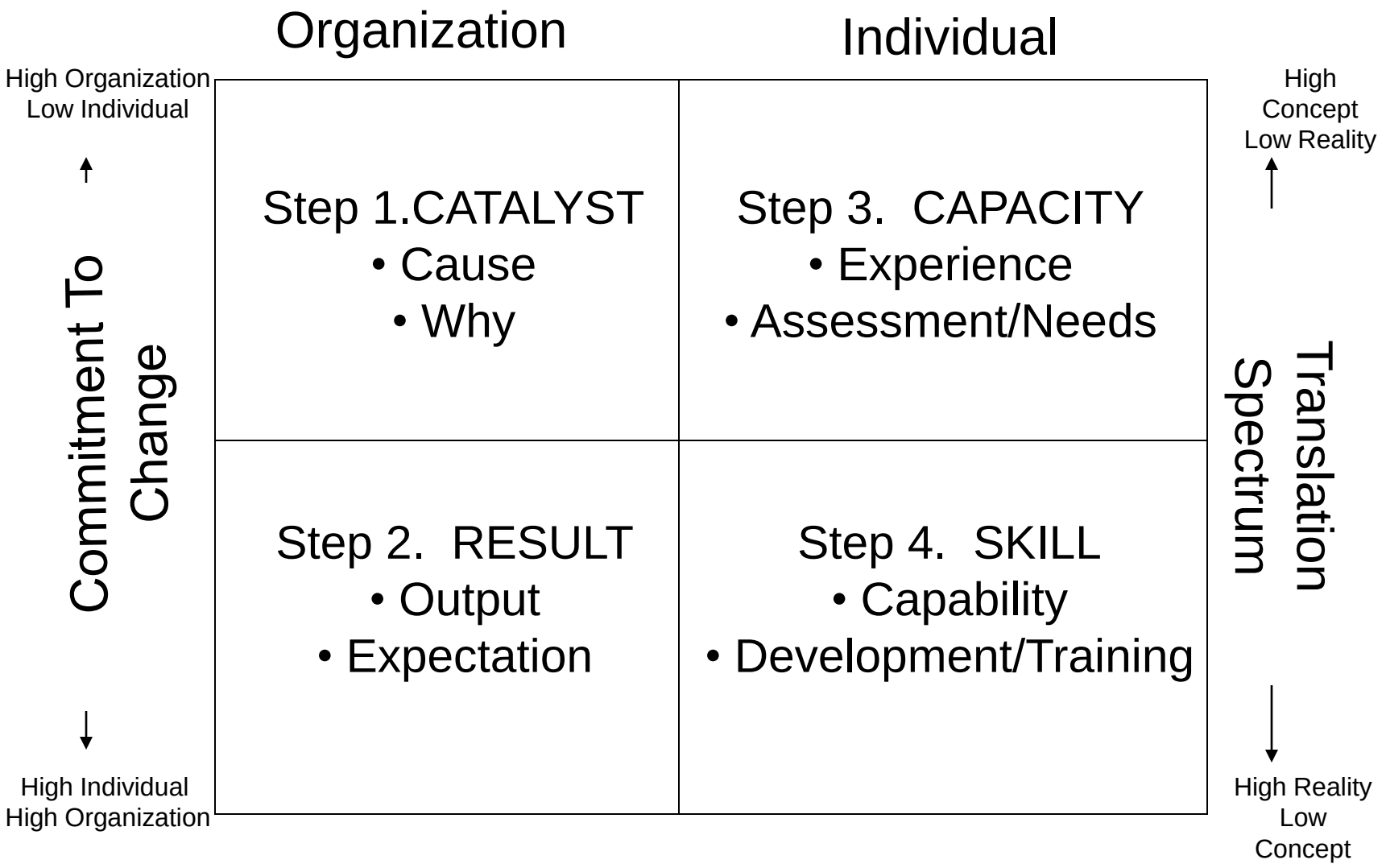
The Four Variables of Change



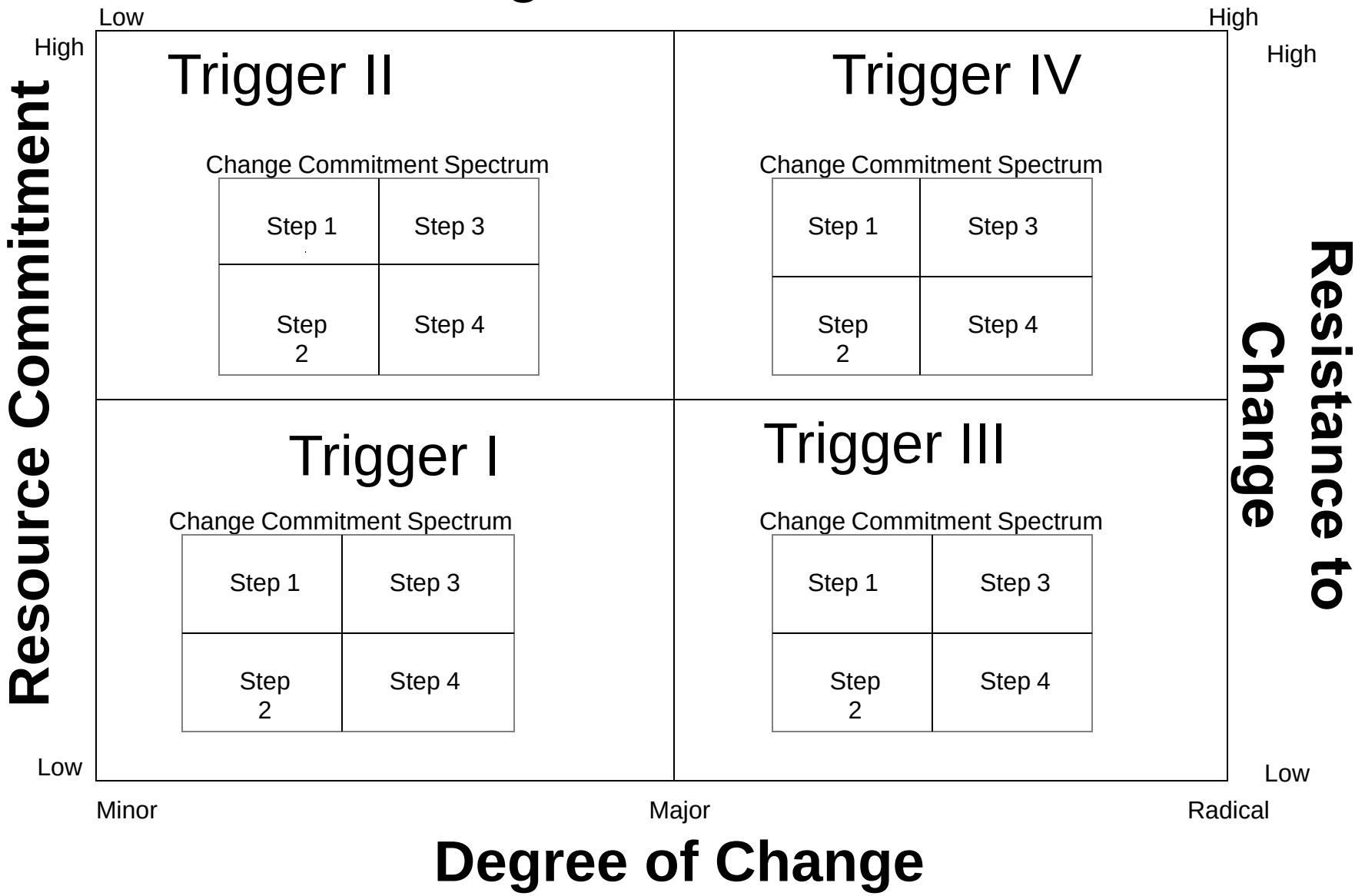
Change Agent Dimensions



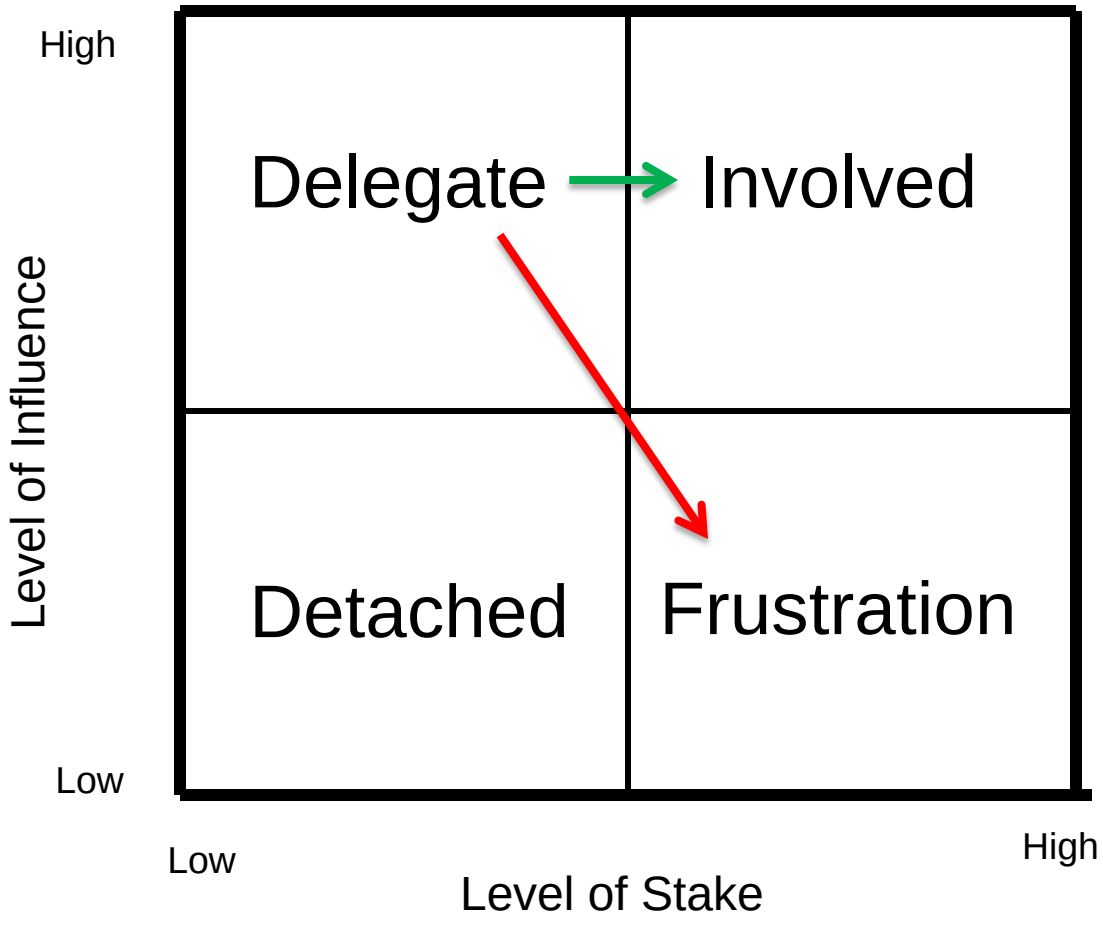
Change Commitment Spectrum



The Four Variables of Change Management Involvement

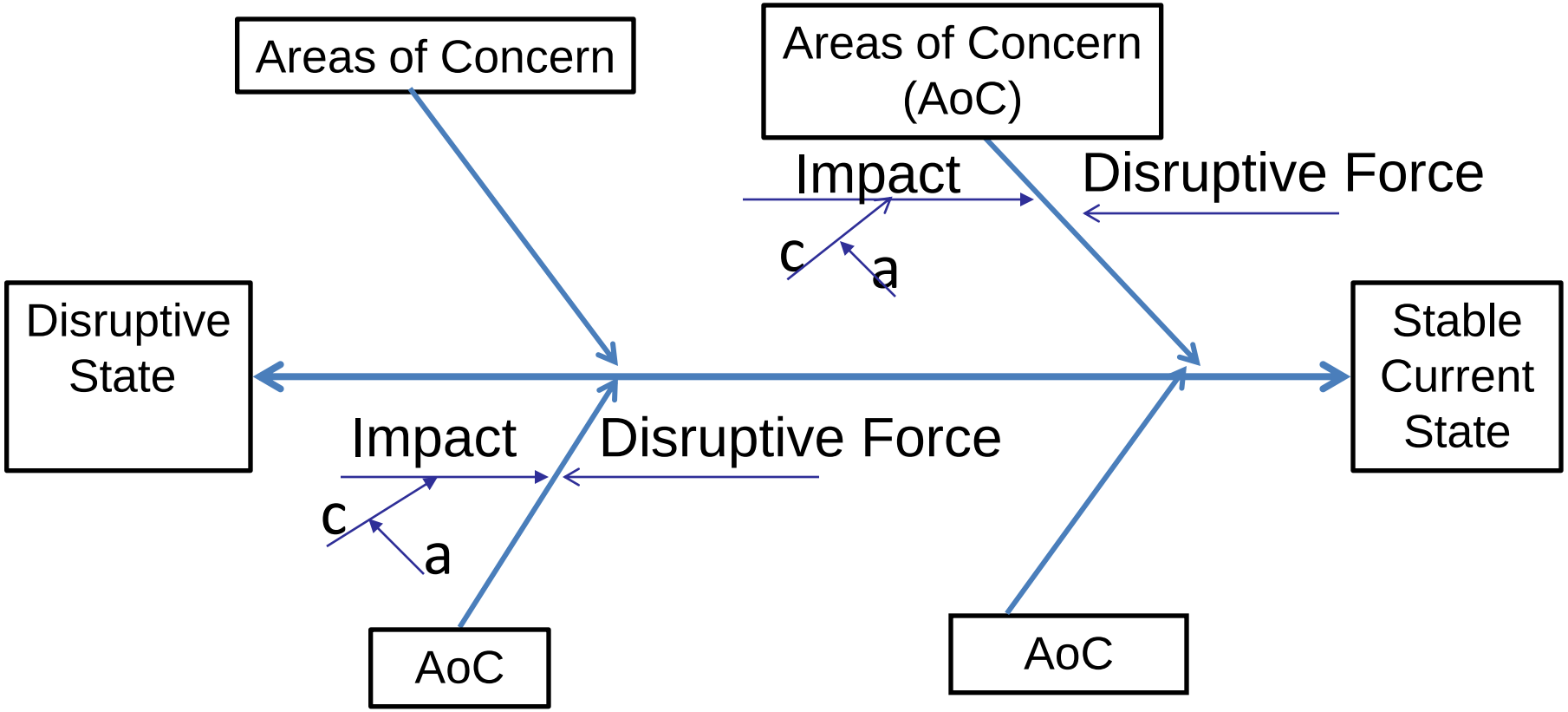


Change Management



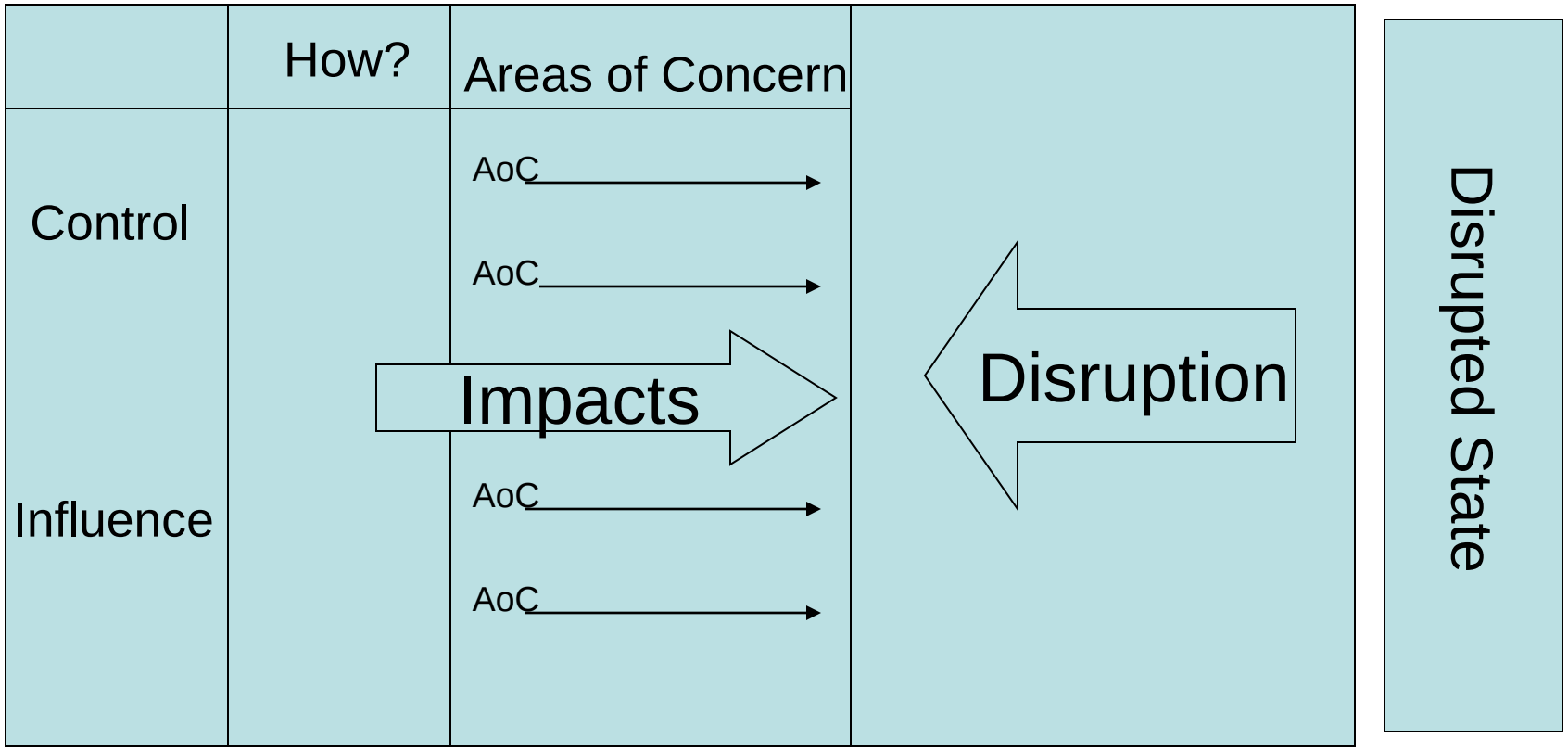
Modular *kaizen* Exercise

Disruption and Impact Diagram



Disruption and Impact Matrix

Disruption: _____ Date: _____



Current State

- Q&A
- Thank You