Quality, Planning, Control, and Improvement Trilogy

June 8, 2011

Updated 10-16-11

Public Health Performance Management Centers for Excellence
Learning Objectives

• Explain difference between Quality Control (QC), Quality Improvement (QI), and Quality Planning (QP)
• Map QC, QI, QP approaches to different quality models (languages)
• Apply key criteria to determine if best approach to start is QC, QI, QP
• List 1 possible area/process within your organization for each of the 3 approaches
Domain 9: Evaluate and continuously improve processes, programs, and interventions
Evaluate the Effectiveness of Public Health Processes, Programs, and Interventions

Standard 9.1 B: Evaluate public health processes, programs, and interventions provided by the agency and its contractors.

Standard 9.2 B: Implement quality improvement of public health processes, programs, and interventions.

2010-2011 Standards for Public Health in Washington State (Local Public Health Agencies)
Poll

Are you using a particular quality model/language?
A. PDCA (PDSA)
B. Six-Sigma / Lean Six-Sigma
C. Other / Mix
D. Not sure yet
The Quality Management Trilogy

QI
“Quality Improvement”

QC
“Quality Control”

QP
“Quality Planning”

Joseph Juran, 1950s

Juran on Leadership for Quality, Free Press, 1989
Beware the Tower of Babel!

The collision of public health jargon, planning jargon, different quality management jargon, and our own LHJ/program jargon can lead to great confusion!
• I love my wife. I love my surfboard.
• Strategic plan. Quality improvement plan. Quality planning. Plan, do, check, act
• Group process. Work process. QI process.
How are QC, QI, and QP different?

• First we have to understand what they have in common.
• Which is a lot ...
Quality Management Principles

All quality methods/approaches are based on…

- Meeting **customer requirements**
- Understanding **variation**
- Standardizing **process**
- Using **continuous scientific method**
Quality Principle: Focus on Customer Requirements

If you’re ever puzzled about what to do next with your process/service/program, you’ll be amazed at how clarifying these questions can be:

- Who is the customer?
- What do they need?
- Are we providing what they need?
- How do we know?
Are we capable of meeting customer requirements?

Days to Complete Request

Here’s where we are

Here’s where customer needs us to be
Quality Principle: Understanding Variation

We’re headed in the right direction!
Uh-oh! We’re slipping! Why? Who screwed up?
Hmmm. Why does it vary so much?
Process Variation

What’s random and expected (common)?
What’s unexpected (special)?

# Times Heads in 10 chance Trial

- # heads
- Avg

[Graph showing variation over trials with an average line]
Process Variation
What's random and expected (common)?
What's unexpected (special)?

# of times coin came up heads in 100 coin flip trials (10 per trial)
Variation Over Time Example

% of time we complete inspection on time

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Sources of Variation

- Methods
- Materials
- Environment
- Staff
- Machines
- Measurements
- Customers

Which among these are variable?

Which among these are controllable?
Why is there variation in results?

Days to Complete Request

# of transactions within interval
Which procedure is more likely to take longer to complete?

A. Inputs:

Step 1

Step 2

Step 3

Step 4

B. Inputs:

Step 1

Step 2

Step 3

Step 4

Step 5
Quality Principle: Process Standardization*

Consistent result requires consistent process

Search for the “one best way” and then *control variation*

*Includes procedures, methods, materials, environment, staff, measurement*
What are some ways we control a process and reduce variation?
Control Examples

a. • Job Descriptions
   • Documented procedures
   • Training
b. • Inspection
   • Supervision
   • Exception reporting
c. • Manuals & cheat sheets
   • Reminders (signs/messages)
   • Check lists
   • Analog asset trackers (File “Out” cards)
   • Just-in-time inventory triggers (Kanban)
   • Digital asset trackers (bar codes)
   • Tracking boards
   • Electronic tracking
   • Forms
   • Required electronic fields
   • In/Out boxes
   • Automated routing (SharePoint)
Quality Principle: Continuous Scientific Method

- Ask a question
- Develop Thesis
- Construct Hypothesis
- Observe
- Test

Galileo, 1250 (but in Italian)
Aspect 1

Analysis of variation to develop a hypothesis

• What is different?
• What is associated with these differences?
• Are some associations stronger than others?
• Why do I get a different result if I do this versus that?
• What causes the difference?
What variation did John Snow ask about?

London Cholera Epidemic 1854

• Who is dying of cholera?
• Where do they live?
• What did they eat, drink, do prior to getting sick?
• What’s different?
• What do they have in common?
• Why the Broadstreet pump?
Scientific Method

Aspect 2
Evidence to confirm hypotheses

• Logic is not enough!
  – People naturally try to expel when they are sick.
  – Expelling bad vapors makes people better.
  – Helping speed the expulsion of bad vapors will help people get well.
  – Blood letting will cure illness.

• Logic + Evidence = Science
Aspect 3
We are always learning

• Theory is not fact.
• We constantly question, test and observe facts to refine and improve our theories.
• Science and quality management are continuous.
• Cycles of inquiry/improvement lead us forward.
Public Health knows how to apply scientific method for continuous improvement

U.S. Infectious Disease Death Rate/100,000/year
1900-1995
Public Health: Science-based continuous improvement

Assess
• Morbidity/Mortality
• Most important/most urgent opportunities

Define
• Clarify aspect/area to be addressed

Evaluate
• Monitor incidences
• Assure compliance/perform surveillance

Analyze
• Analyze disease data
• Identify causes OR at least controllable sources

Change
• Policies/practices/behaviors
QC, QI, and QP are mostly the same...

- Meeting *customer requirements*
- Understanding *variation*
- Standardizing *process*
- Using *continuous scientific method*
When we return ...  
Quality Trilogy ... what’s different?
Quality Trilogy ~ So what’s different?

“Quality Control”
Process Control

“Quality Improvement”
Process Improvement

“Quality Planning”
Process Design
Trilogy as different objectives

- **Quality Improvement** (process improvement):
  - Maximize performance of existing process
  - Determine causes of variation
  - Establish control
  - Create conditions for further improvement
- **Quality Control** (process control):
  - Maintain performance, and perhaps ...
  - Incrementally improve
- **Quality Planning** (process design):
  - Provide a whole new service/product, OR
  - (re)Align process performance to customer needs, OR/AND
  - Obtain whole new level of performance
Trilogy as connected phases of results

Days to respond to complaint

A. Existing range of performance
B. Process Improvement Project
C. Process Control
D. Process (re)Design Project
E. Process Control
Trilogy as different starting places

- **QC**
  - Problem(s) narrow & easily defined
  - Variables understood
  - Measures & Controls in place
  - Customer needs understood
  - Process capable

- **QI**
  - Problem(s) more complex (though still easily defined)
  - Process exists; may have been documented
  - Few controls in place
  - Data available but unanalyzed
  - Customer needs assumed
  - Process appears capable of meeting customer needs - at least some of the time
  - Process reasonably stable

- **QP**
  - Customer needs are consistently going unmet
  - Process/service does not exist, or
  - Current performance not capable of meeting customer needs

QIDW | QI-QP hybrid
---|---

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Exercise

• Think of problems / opportunities within your department/agency

• Identify one that might make a good quality improvement (process improvement) topic

• Identify one that might make a good quality planning (process design) topic

• Be ready to share ...
When is a Quality Improvement Project appropriate?

- Cross functional problem
- There is an existing process that is reasonably understood
- Problem can be narrowly defined - cycle-time, # of incidences, etc. (1 or maybe 2 problems; not many)
- Customer requirements are understood
- Performance data are available or can be collected without too much time and/or expense
- Environment is stable - no major market, organization, or technology changes on near horizon
- There is organizational support for effort during AND after project complete
When is Quality Planning project appropriate?

- Service/process has never existed before
- Customer requirements are not known
- OR, Existing service/process performance is not capable of meeting customer requirements
- Service/process is ad hoc; *extremely* variable; never been well defined or worked on before *as a whole*
- Current performance has multiple problems ... not 1 or 2
- Unstable environment - major market, technology, organizational change on *near* horizon
- No performance data exist or would take excessive time/expense to collect data
- Organizational support for effort during and after the project
Trilogy as different actions

- **QC** ... less analysis, more trial and error, more emphasis on standardizing/tweaking what you already have
- **QI** ... more analysis, more testing of theories, more things to change, more emphasis on setting things up for control
- **QP** ... more customer needs analysis, more benchmarking, total change management, ensuring suppliers can perform as needed; complete measurement and control plan
QC, QI, QP as Different Actions

**Process Improvement**
- How many trips through which *funnels*?
- Many problems
  - Most important problems
- Many contributors
  - Largest contributors
- Many theories of cause
  - Root cause
- Many possible solutions
  - Best solution

**Process Control**
- Many theories of cause
  - Root cause
- Many possible solutions
  - Best solution

**Process Design**
- Many possible designs
  - Key Needs
  - Many needs
  - Primary customers
  - Many customers
  - Most important opportunities
  - Many opportunities
  - Best design
Trilogy as different intensity & organization of effort

- QC: A little effort every day and forever
  - Performed by people in process as part of their job

- QI: A lot of effort by a project team for a specific time period;
  - Hand-off to existing operations

- QP: A very large amount of effort by a project team for a specific time period;
  - Hand-off to new operation

QIDW     QI-QP hybrid
The Trilogy in Different Languages

Deming

Appreciative Inquiry

Shewhart

PDCA

LEAN 6S

Juran

Public Health
Classic Quality Control, an alternative to inspection & tampering
Shewhart PDCA Control cycle

Why are we out of control?

PLAN

Determine theory to be tested

DO

Complete test

ACT

Take corrective action

CHECK

Implement change

Monitor/evaluate performance

Develop test plan

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PDCA for Improvement

Determine Area Needing Improvement

Plan

- Define problem (AIM statement)
- Gather/review baseline measures
- Analyze problem/process
- Determine causes
- Develop possible solution

Do

- Test solutions
- Implement solutions system wide
- Manage change

Check

- Monitor/evaluate performance

Act

- Take corrective action
• Some say “YES”
  – Modify the steps within “Plan” & “Do” to achieve needs of a design process

• Some say “NO”
  – Use a different planning/design method
  – E.g., Appreciative Inquiry or other
**PDCA for QP/Process Design**

**PLAN**
- Define Opportunity
- Determine customers
- Analyze Customer Needs
- Develop product/process options
- Determine supplier requirements
- Develop draft design

**DO**
- Test design with customers
- Test design with suppliers
- Finalize Design
- Prevent failure
- Design measures and controls
- Manage Change

**CHECK**
- Monitor/Evaluate Performance

**ACT**
- Take corrective action

**Determine Opportunity**
- Define Opportunity
- Determine customers
- Analyze Customer Needs
- Develop product/process options
- Determine supplier requirements
- Develop draft design
Appreciative Inquiry, an option for a separate process design method

Define
Discover
Dream
Design
Deliver

Cooperrider and Srivastva, *Appreciative Inquiry in Organizational Life*, 1987
Juran Articulation of Trilogy

- **QI** - define, diagnose, implement, control
- **QP** - define, understand, design, implement, control
- **QC** - PDCA
Lean-Six Sigma Articulation of Trilogy

- **QI** - DMAIC (define, measure, analyze, improve, control)
- **QP** - DMADV (define, measure, analyze, design, verify)
- **QC** - LEAN QIDW

**Value Stream**
- **Value**
  - Determine Purpose
  - Determine Customer requirements
- **Replication**
  - Expand to other areas
- **Perfection**
  - Continuous Improvement
- **Flow**
  - Smooth & Standardize
- **Pull**
  - Balance/JIT inventories

**Pull**
- **Value Stream**
- **Perfection**
- **Replication**
- **Value**

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**Define**
- Problem/Opportunity
- Process to be addressed
- Measure(s) of success

**Assess**
- Consider goals and current performance
- Prioritize opportunities

**Analyze**
- Analyze process/data
- Identify Root Cause(s)

**Change**
- Develop solutions
- Manage and Implement Change

**Evaluate**
- Monitor progress
- Act on exceptions

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Same Basic Method...Different Applications

Quality Improvement Project

Frontline Program QI

Quality Planning Project
Quality Improvement Project Steps

**Assess**
1. Assess organizational goals and current performance
2. Determine most important problems/biggest opportunities

**Define**
3. Define problem/opportunity
4. Define process(es) /service to be addressed
5. Define measure(s) of success
6. Define Stakeholders, Customers and Team

**Analyze**
7. Analyze process(es) and data
8. Determine potential causes
9. Determine “root” causes

**Change**
10. Consider solution options
11. Determine “best” solution(s)
12. Test Solutions
13. Manage Change
   - Social
   - Technical
14. “Hand-off” to operations - including Evaluation plan

**Evaluate**
15. Monitor performance against measures
16. Maintain solution(s) (if working)
17. Re-enter Improvement Cycle
### Quality Planning Project Steps

**Assess**
1. Assess organizational goals and current performance
2. Determine most important problems/biggest opportunities

**Define**
3. Define problem/opportunity
4. Define process(s)/service to be addressed
5. Define measures of success
6. Define stakeholders, customers and team

**Analyze**
7. Determine customer needs
8. Translate customer needs into service features
9. “Benchmark” other service providers

**Change**
10. Consider service/process design options
11. Determine supplier requirements
12. Determine “best” integrated design
13. Prevent Failure
14. Manage Change
   - Social
   - Technical
15. “Hand-off” to operations - including Evaluation plan

**Evaluate**
16. Monitor performance against measures
17. Maintain process (if working)
18. Enter Improvement Cycle
The QI-QP “Hybrid” Project

- Projects can start with a QI approach and not find narrow “root” causes.
- Large portions or even all of the process may need to be re-designed.
- You may start a project and realize you don’t really know what customer needs.
- Even standard QI projects can sometimes benefit by “borrowing” from the QP toolbox.

“The Liger is pretty much my favorite animal”
-- Napoleon Dynamite

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Program QI

Assess
1. Assess department goals, customer needs, and current performance
2. Define Departmental measures of success
3. Put measurement system in place

Define
4. Define specific problem & process to be addressed
5. Define specific measures of success

Analyze
6. Analyze current process and environment
7. Determine potential causes
8. Determine most likely “root” causes

Change
9. Consider solution options
10. Determine “best” solution
11. Implement solution

Evaluate
12. Monitor performance against measures
13. Maintain solution(s) (if working)
14. Re-enter Improvement Cycle
Program QI vs. Project QI

• QI Projects are time-limited.
• Program QI efforts are on-going.
• QI Projects “hand-off” to operations.
• Program QI IS operations.
What else is different about Program QI?

• Less meeting intensive
• A little less data driven (at least to start)
  – Start with the obvious (“nuggets on the ground”)
• Involves everyone in the Program
• Uses shop floor tools and techniques
  – “LEAN” style emphasis on space, flow, and inventories
Program QI cycles (A typical pattern)

Define
Analyze
Change
Evaluate

Define
Analyze
Change
Evaluate

“LEAN” style improvements

Data-Driven Improvements

“Nuggets on the Ground”

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Programs especially well suited to QIDW/Program QI (characteristics)

- High volume
- Time / Error Rates/ Productivity
- Transactional
- Stable (reasonably)
- Variation factors within group’s influence
Discussion

- Programs you might consider for such an approach?
Learning Objectives Revisited

• Explain difference between Quality Control, Quality Improvement, and Quality Planning.
• Map QC, QI, QP approaches to different quality models (languages).
• Apply key criteria to determine if best approach to start is QC, QI, QP.
• List 1 possible area/process within your organization for each of the 3 approaches.
References

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