

Quality Improvement Methods & Tools

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Introductory Session

This introductory session on Quality Improvement Methods and Tools will provide participants with a basic understanding of the following topics:

- Overview of Quality Improvement (QI)
- Understand the difference between Big QI and little qi
- Describe the use of the Plan-Do-Check-Act approach to QI
- Understand the concept of Rapid Cycle PDCA
- Understand how to use the basic QI tools in a defined sequence to identify areas needing improvement
- Review the 7 basic QI tools with a focus on Flow Charting and Cause and Effect Diagrams
- Understand how and why to identify “root causes” of problems
- How QI is accomplished in Teams
- Top Ten Reasons QI fails and how to overcome them



...*PHF Mission:*

We improve the public's health by strengthening the quality and performance of public health practice

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***Innovative Solutions.
Measurable Results.***



Introduction To QI

Definition of Quality Improvement in Public Health

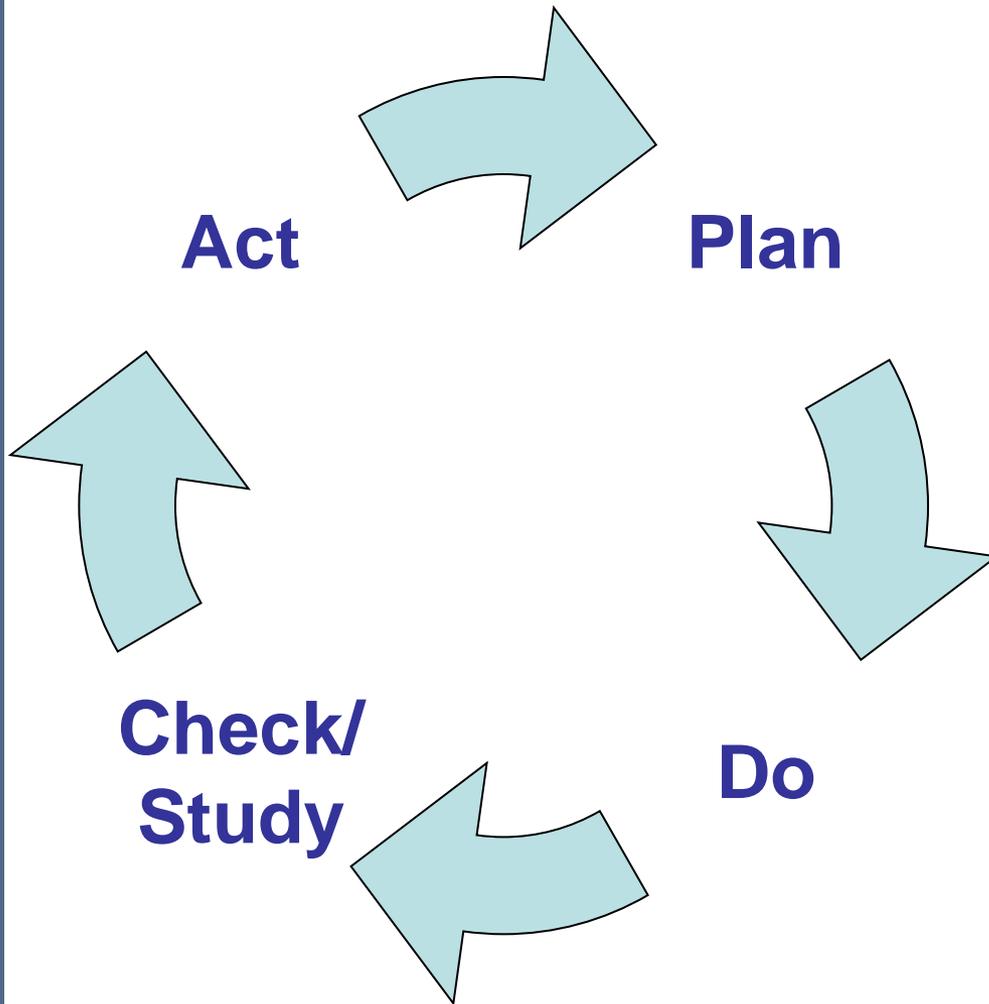
“Quality improvement in public health is the use of a deliberate and defined improvement process, such as Plan-Do-Check-Act, which is focused on activities that are responsive to community needs and improving population health.

It refers to a continuous and ongoing effort to achieve measurable improvements in the efficiency, effectiveness, performance, accountability, outcomes, and other indicators of quality in services or processes which achieve equity and improve the health of the community.”

This definition was developed by the Accreditation Coalition Workgroup (Les Beitsch, Ron Bialek, Abby Cofsky, Liza Corso, Jack Moran, William Riley, and Pamela Russo) and approved by the Accreditation Coalition on June 2009.



Continuous Improvement



The continuous improvement phase of a process is how you make a change in direction. The change usually is because the process output is deteriorating or customer needs have changed.

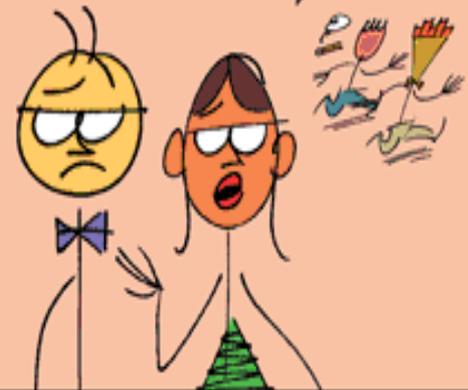
Well, we certainly have never seen such a unique application of PDCA.

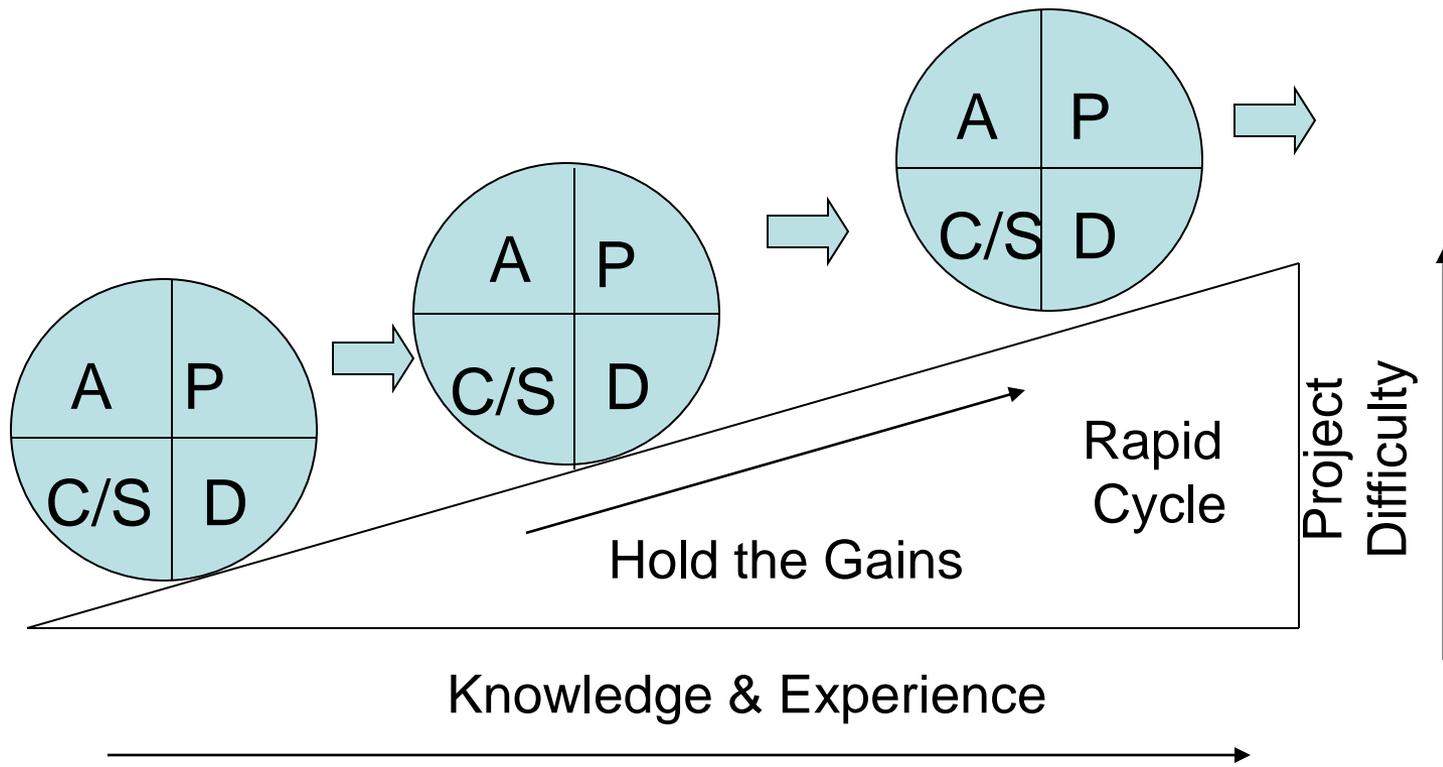


It seems that you do a great job with **Plan**, **Do** and **Check**.



I think Deming meant "A" to stand for "**A**ct" - not "**A**void." Hey - where are they going?

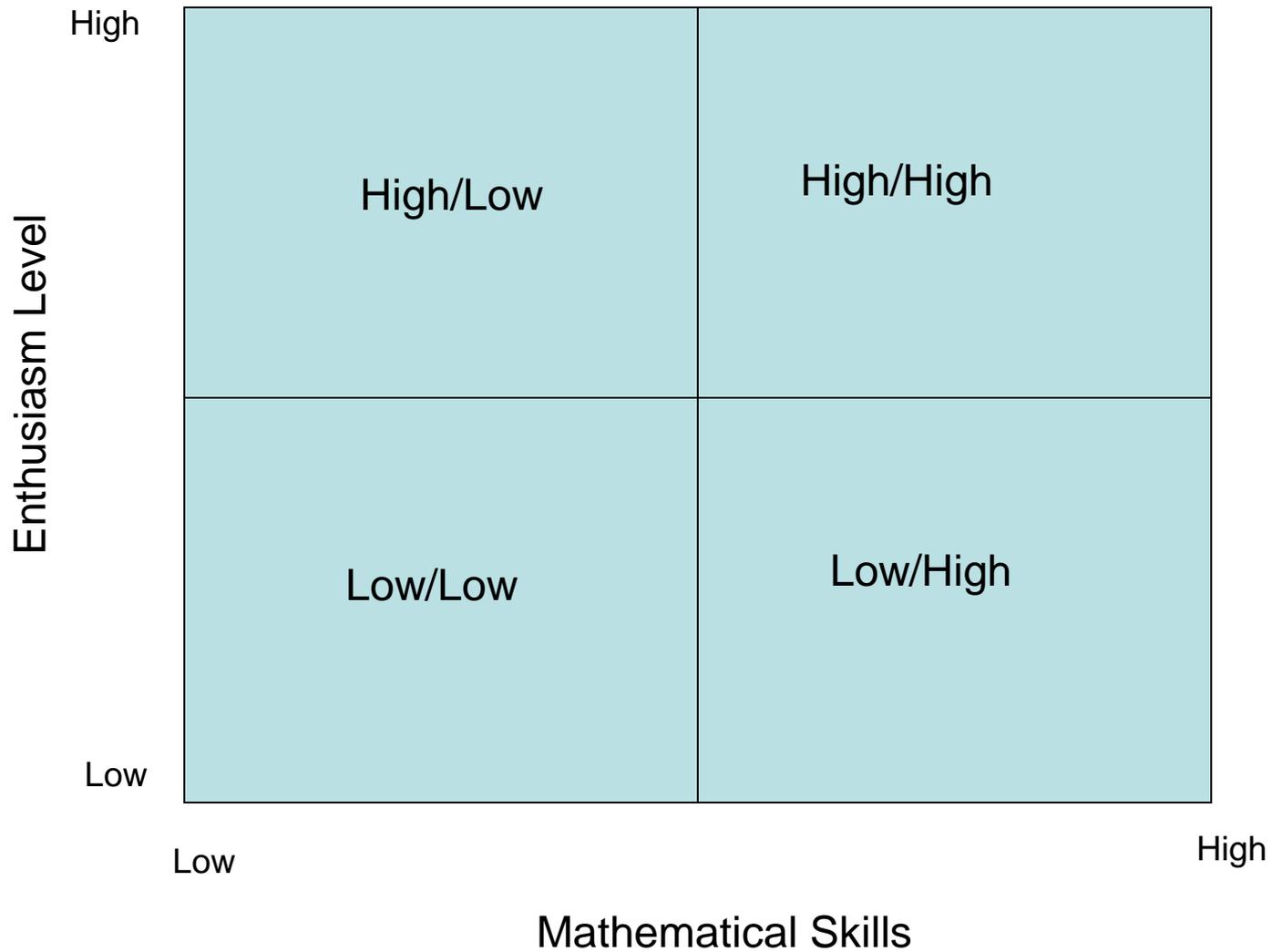




Quick Check of Your

Enthusiasm Level
&
Mathematical Skills



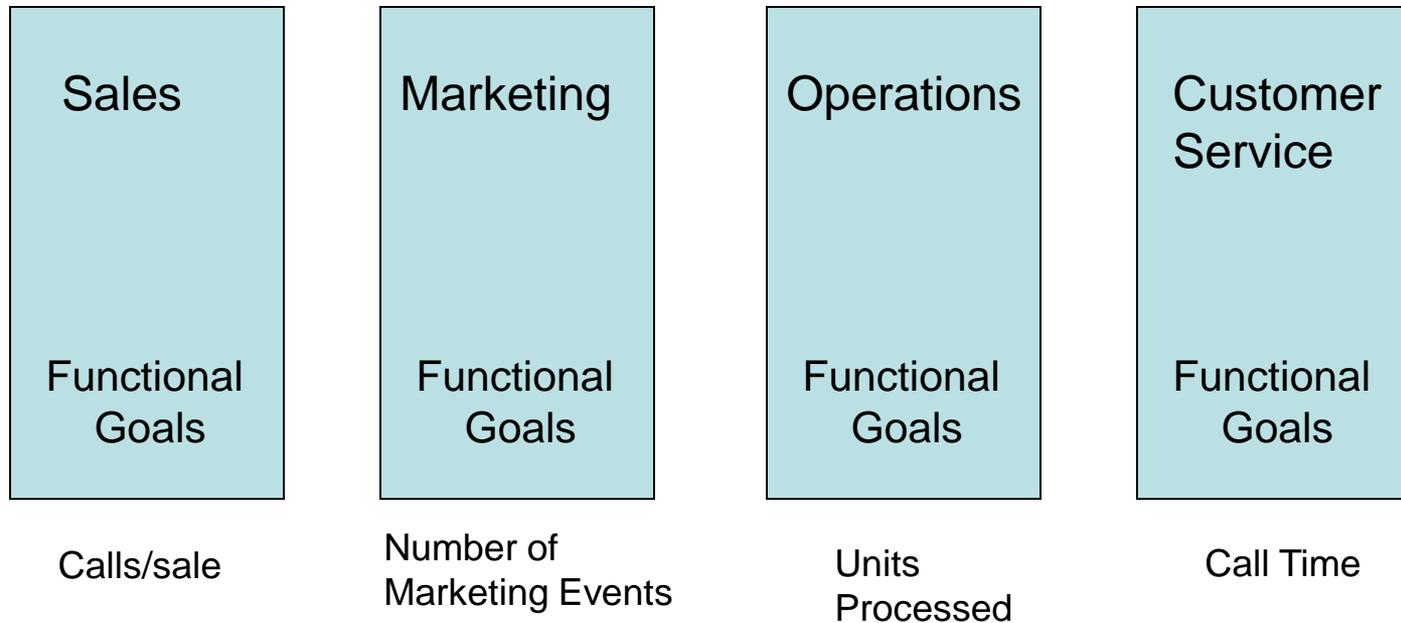
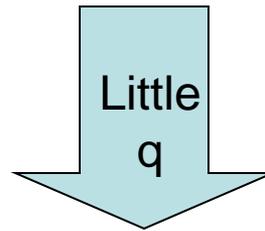


What Is Different About Public Health?

- **Limited Control**
- **Many disparate parts – not tied together**
- **Sometimes conflicting missions**
- **Need to be a good influencer**

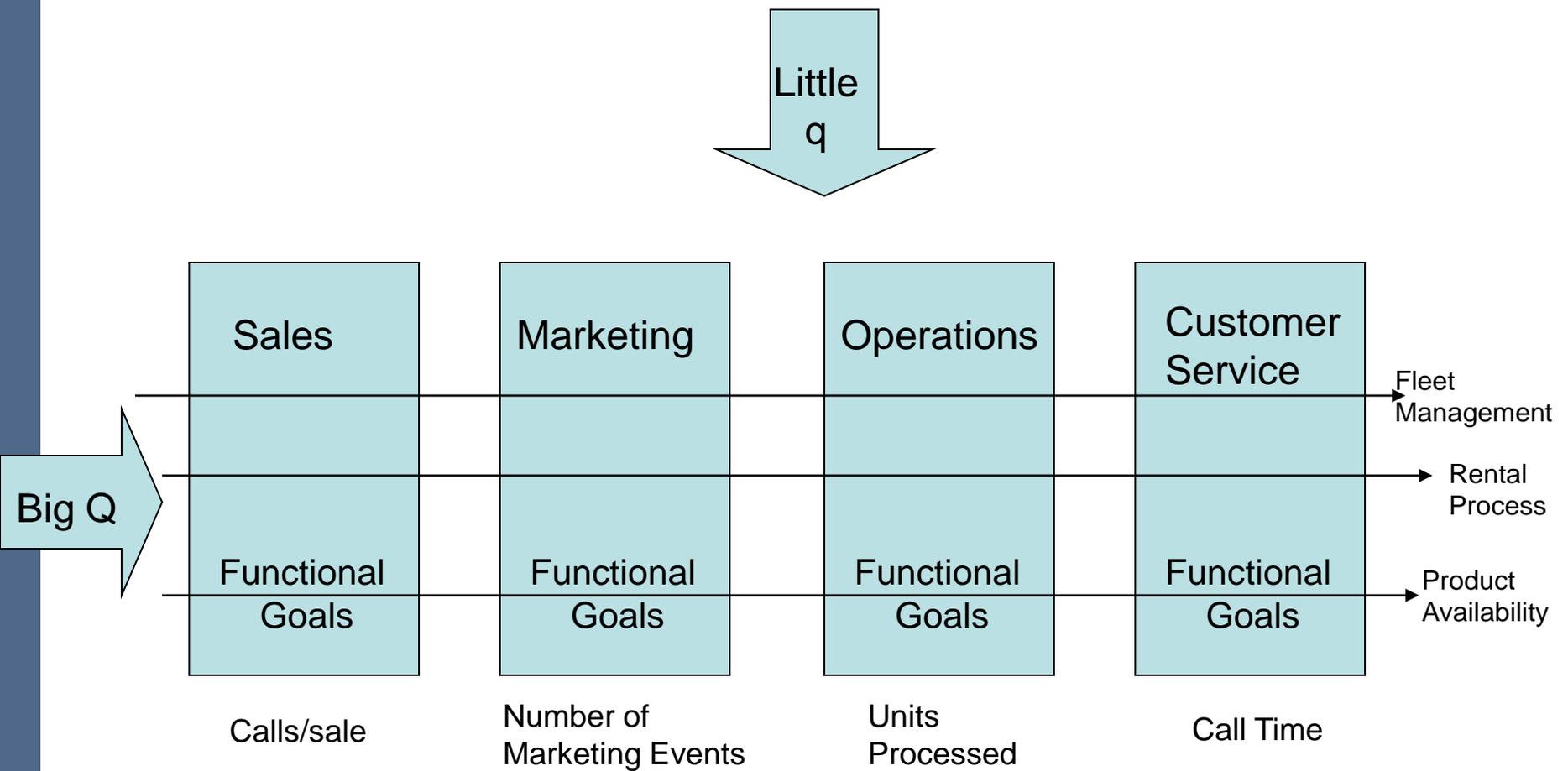
Contrasting Big “QI”, Little “qi”, and Individual “qi

Topic	Big ‘QI’ – organization-wide	Little ‘qi’ – program/unit	Individual ‘qi’
Improvement	System focus	Specific project focus	Daily work level focus
Quality Improvement Planning	Tied to the Strategic Plan	Program/unit level	Tied to yearly individual performance
Evaluation of Quality	Responsiveness to a community need	Performance of a process over time	Performance of daily work
Processes	Cut across all programs and activities	Delivery of a service	Daily work
Quality Improvement Goals	Strategic Plan	Individual program/unit level plans	Individual performance plans



Problems – functional (silos) goals result in process gaps, overlaps, rework, etc.

Customer wants may not be in sync with what each department wants

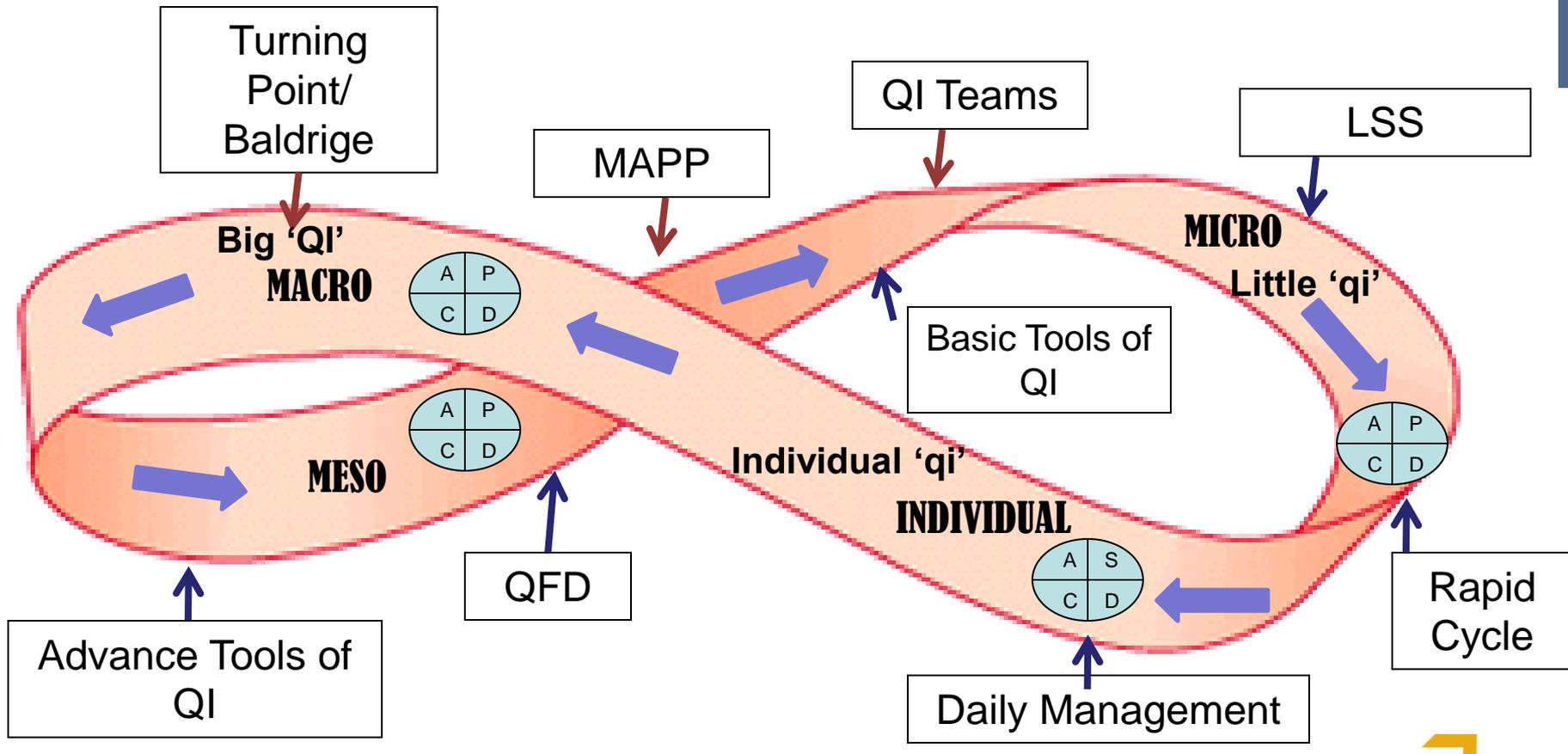


Customer wants may not be in sync with what each department wants

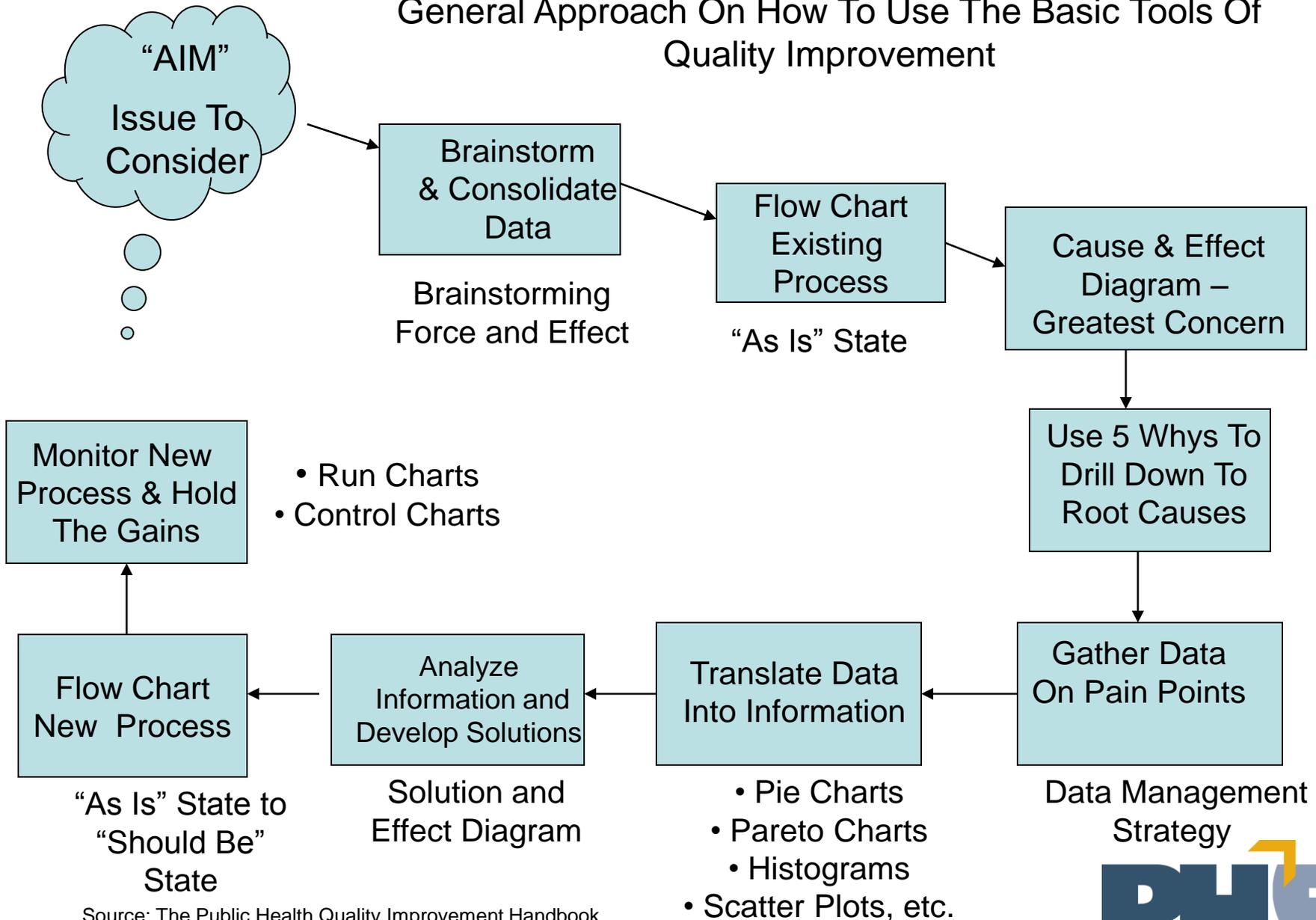
Now the focus is on providing the customer with product knowledge, right cars for their needs, easy access, multiple locations, insurances, and safe vehicles



Continuous Quality Improvement System in Public Health



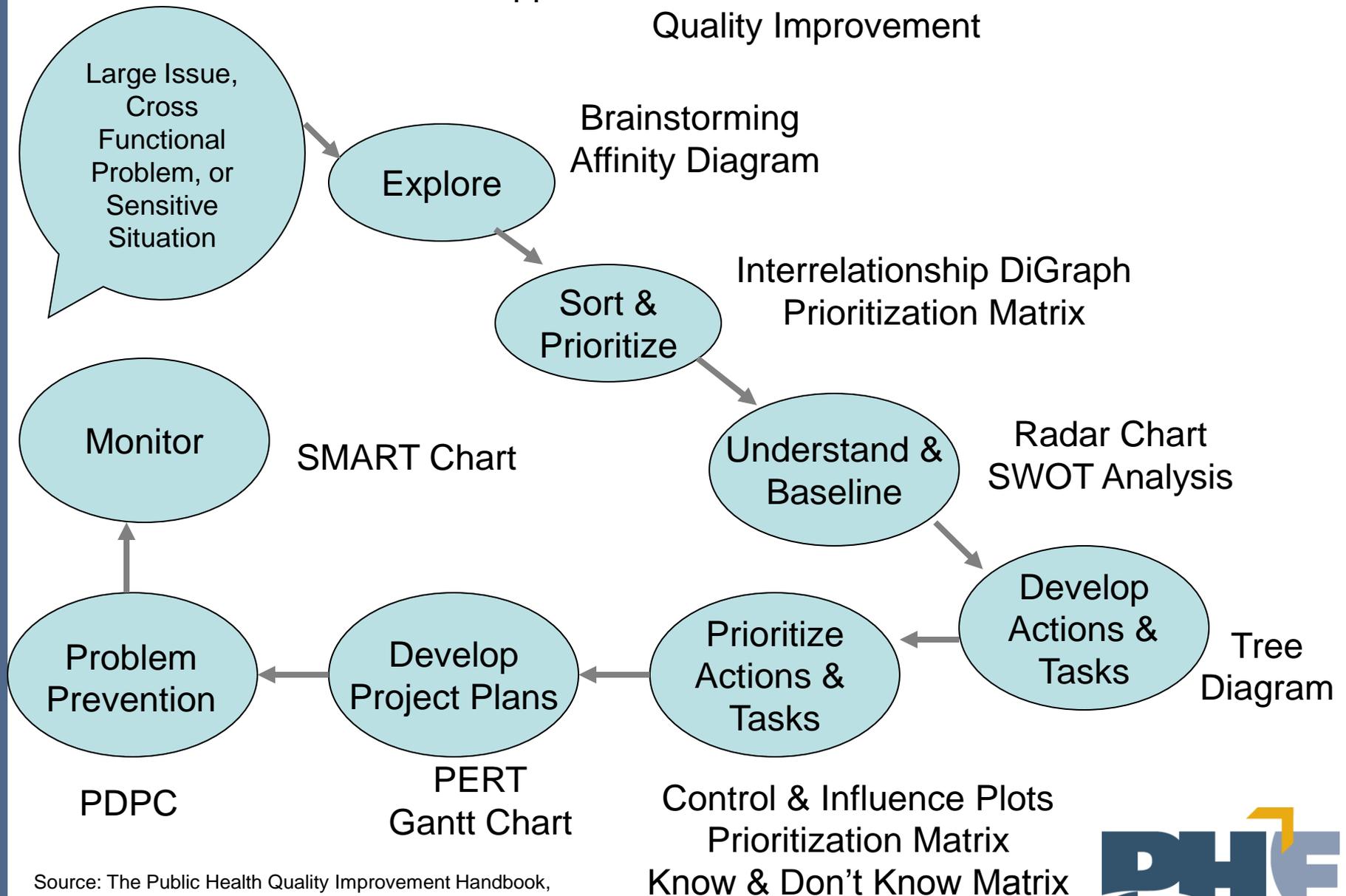
General Approach On How To Use The Basic Tools Of Quality Improvement



Source: The Public Health Quality Improvement Handbook,
R. Bialek, G. Duffy, J. Moran, Editors,
Quality Press, © 2009, p.160



General Approach On How To Use The Advanced Tools Of Quality Improvement



Source: The Public Health Quality Improvement Handbook,
R. Bialek, G. Duffy, J. Moran, Editors,
Quality Press, © 2009, p.190



What Is Quality?

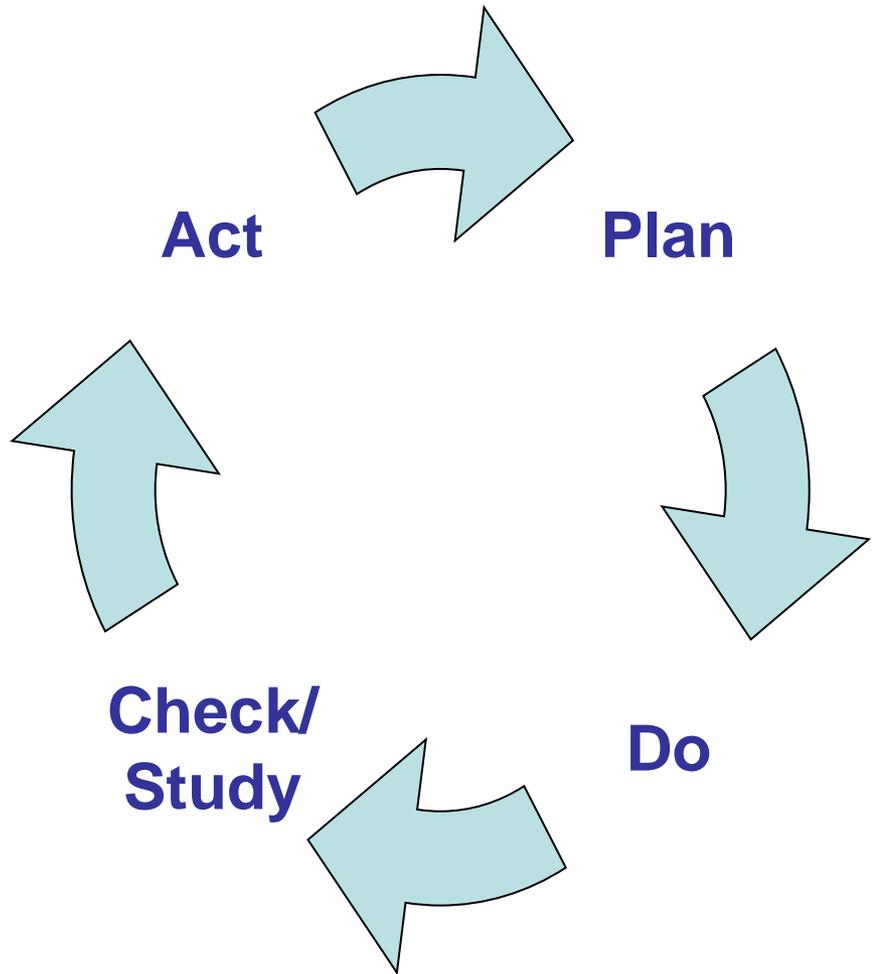
- Today the most progressive view of quality is that it is defined entirely by the customer or end user and is based upon that person's evaluation of his or her entire customer experience.
- The customer experience is the aggregate of all the *Touch Points* that customers have with the organization's product and services, and is by definition a combination of these.



Deming Cycle – PDCA or PDSA

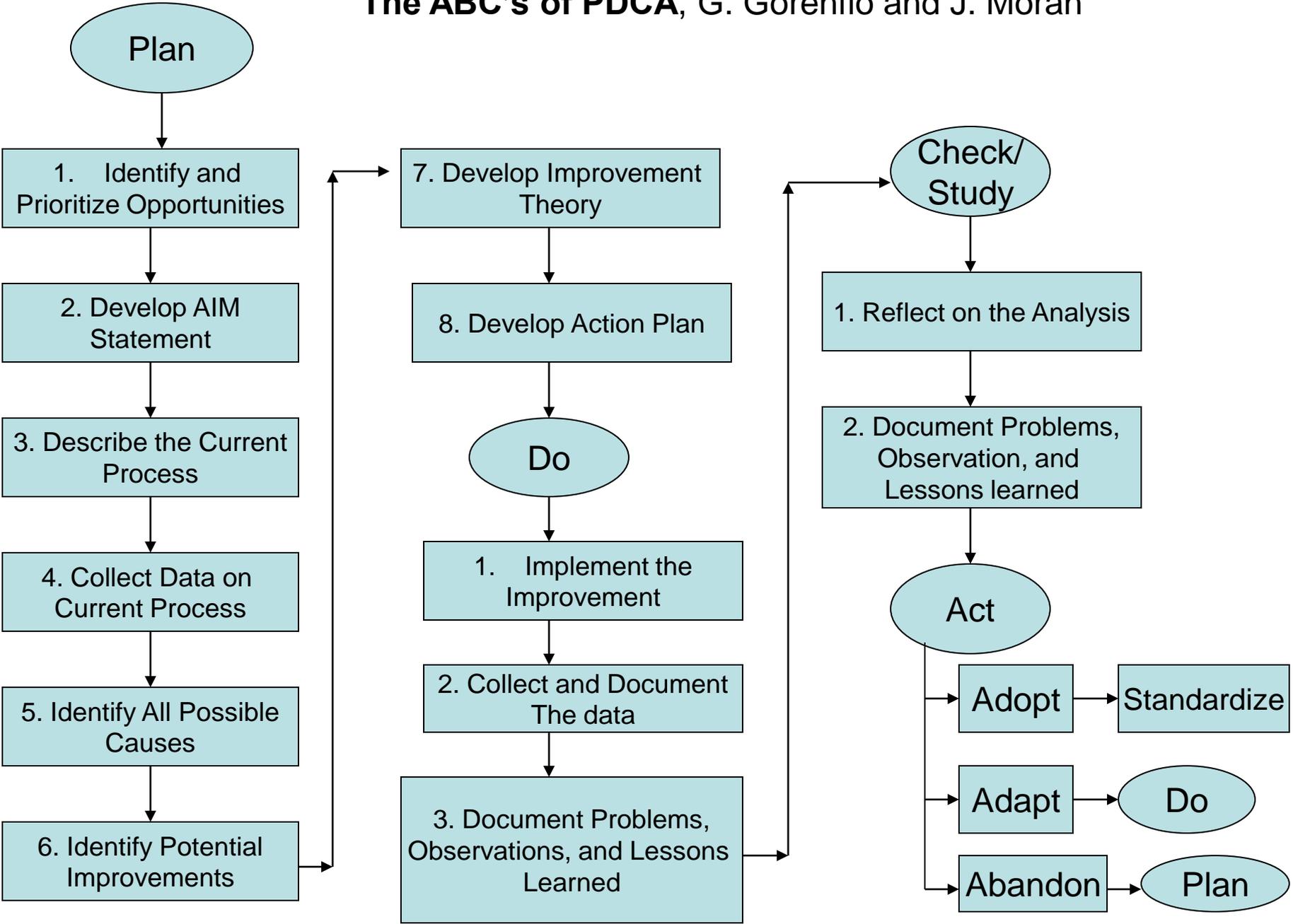
- PDCA was made popular by Dr. Deming who is considered by many to be the father of modern quality control; however it was always referred to by him as the "Shewhart cycle."

Continuous Improvement

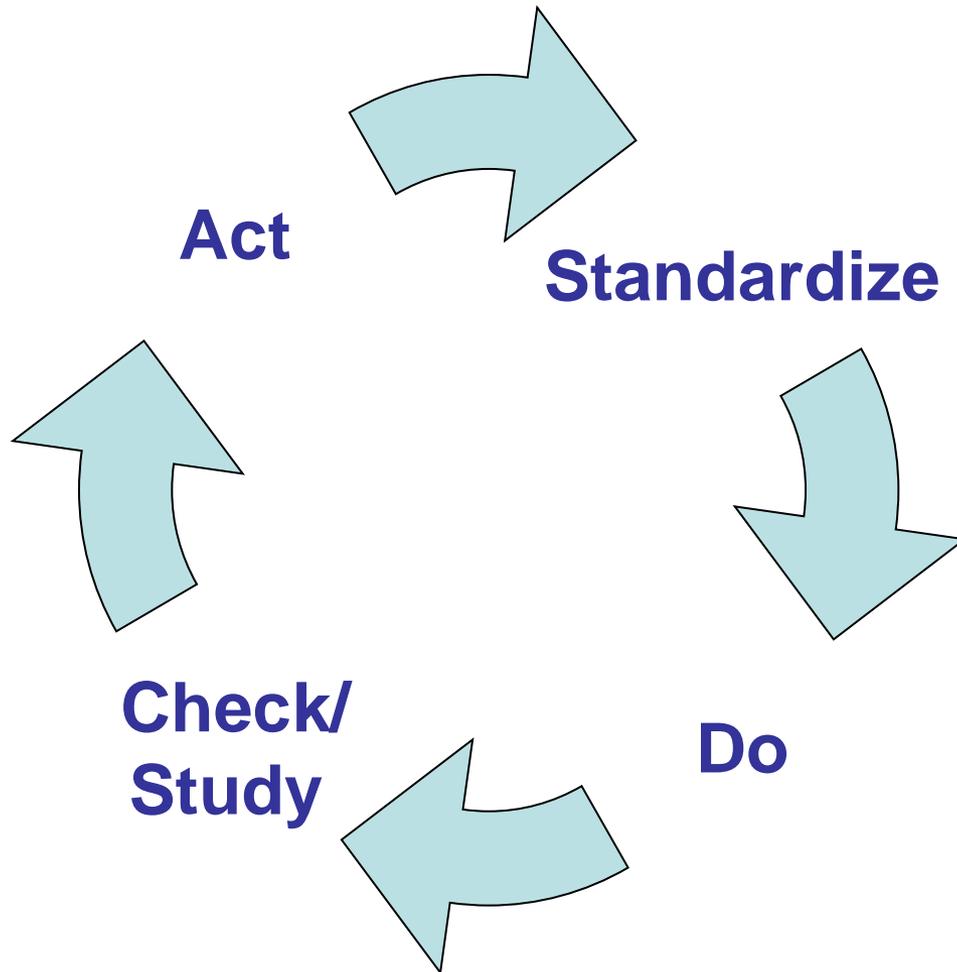


The continuous improvement phase of a process is how you make a change in direction. The change usually is because the process output is deteriorating or customer needs have changed.

The ABC's of PDCA, G. Gorenflo and J. Moran

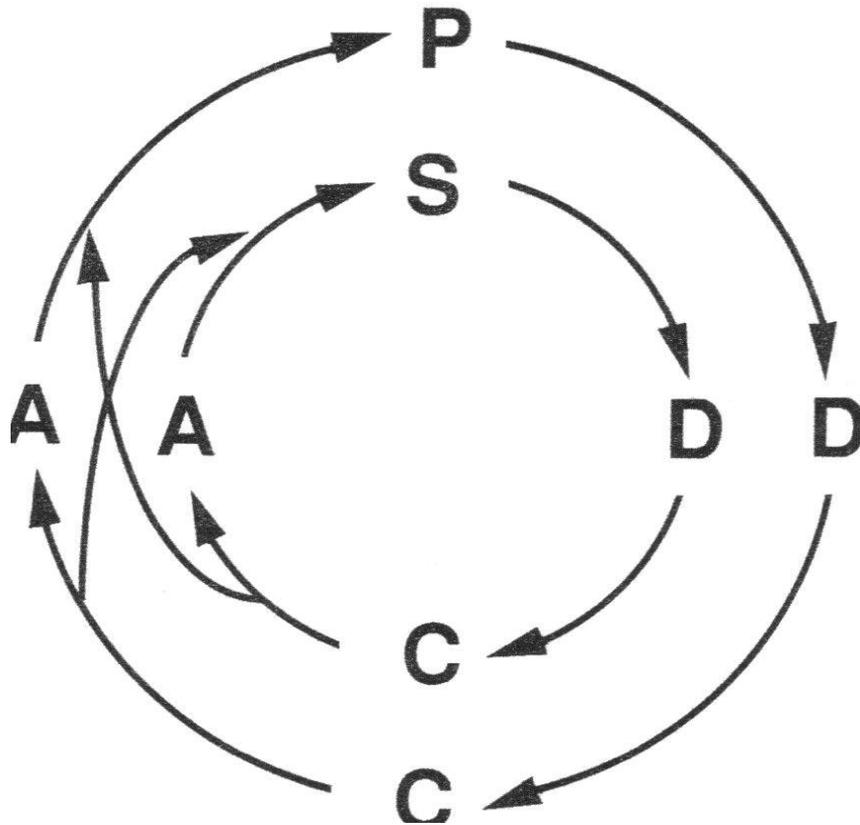


Maintenance and Standardization



The Maintenance and Standardization phase of a process is how we hold the gains. If our process is producing the desired results we standardize what we are doing.

Integrated Cycle

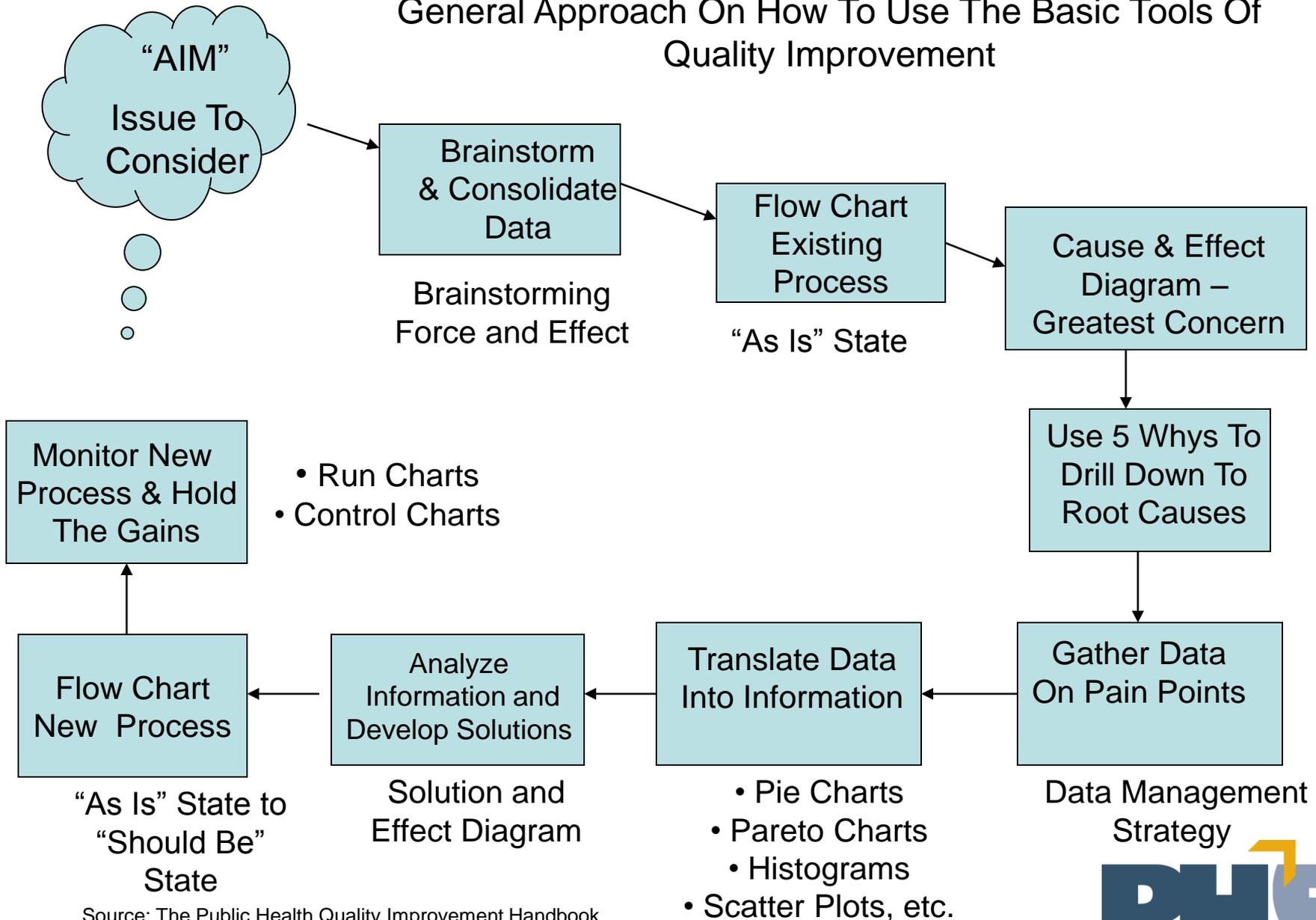


The SDCA and PDCA cycles are separate but rather integrated. Once we have made a successful change we standardize and hold the gain.

When the process is not performing correctly we go from SDCA to PDCA and once we have the process performing correctly we standardize again.

This switching back and forth between SDCA and PDCA provides us with the opportunity to keep our process customer focused.

General Approach On How To Use The Basic Tools Of Quality Improvement



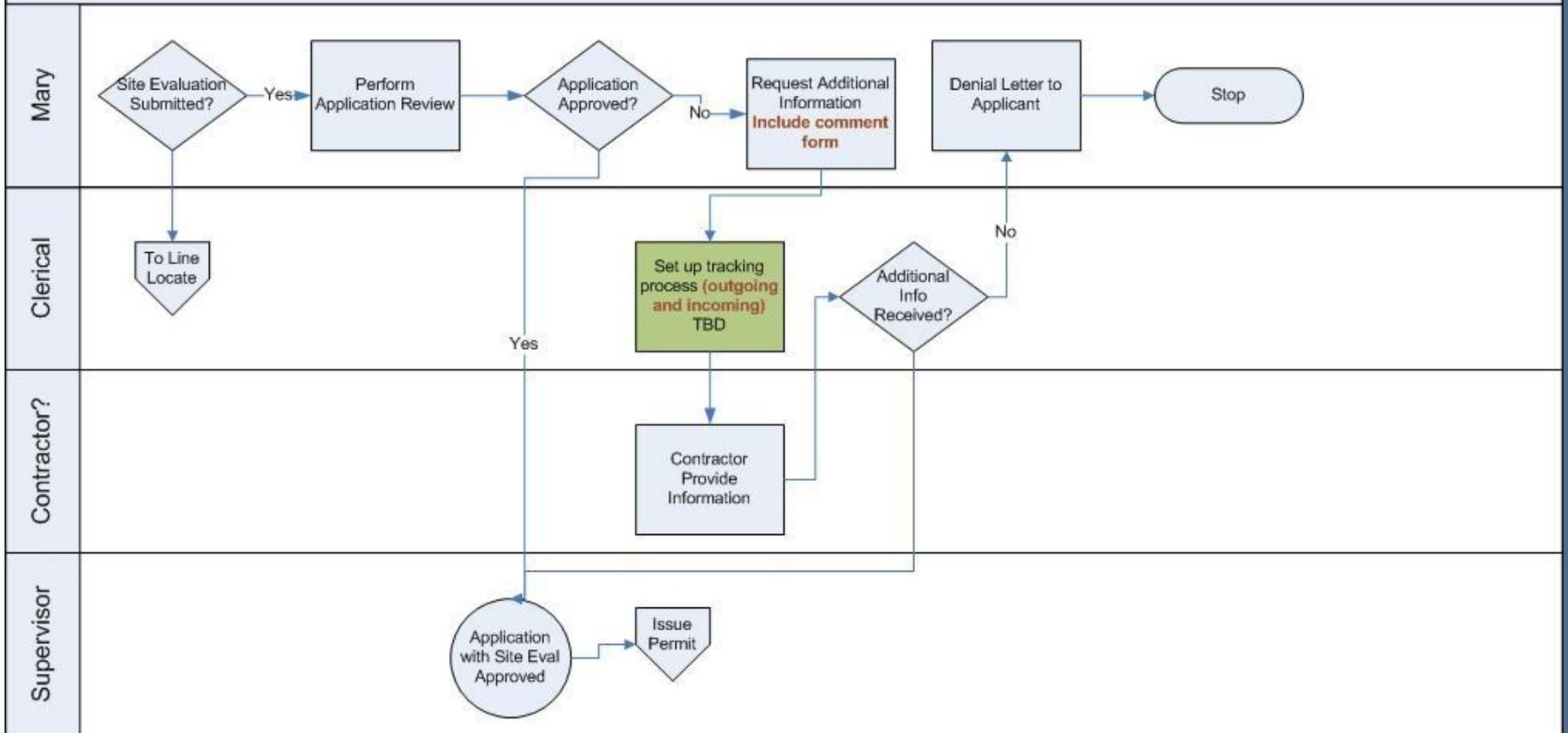
Source: The Public Health Quality Improvement Handbook,
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Quality Press, © 2009, p.160



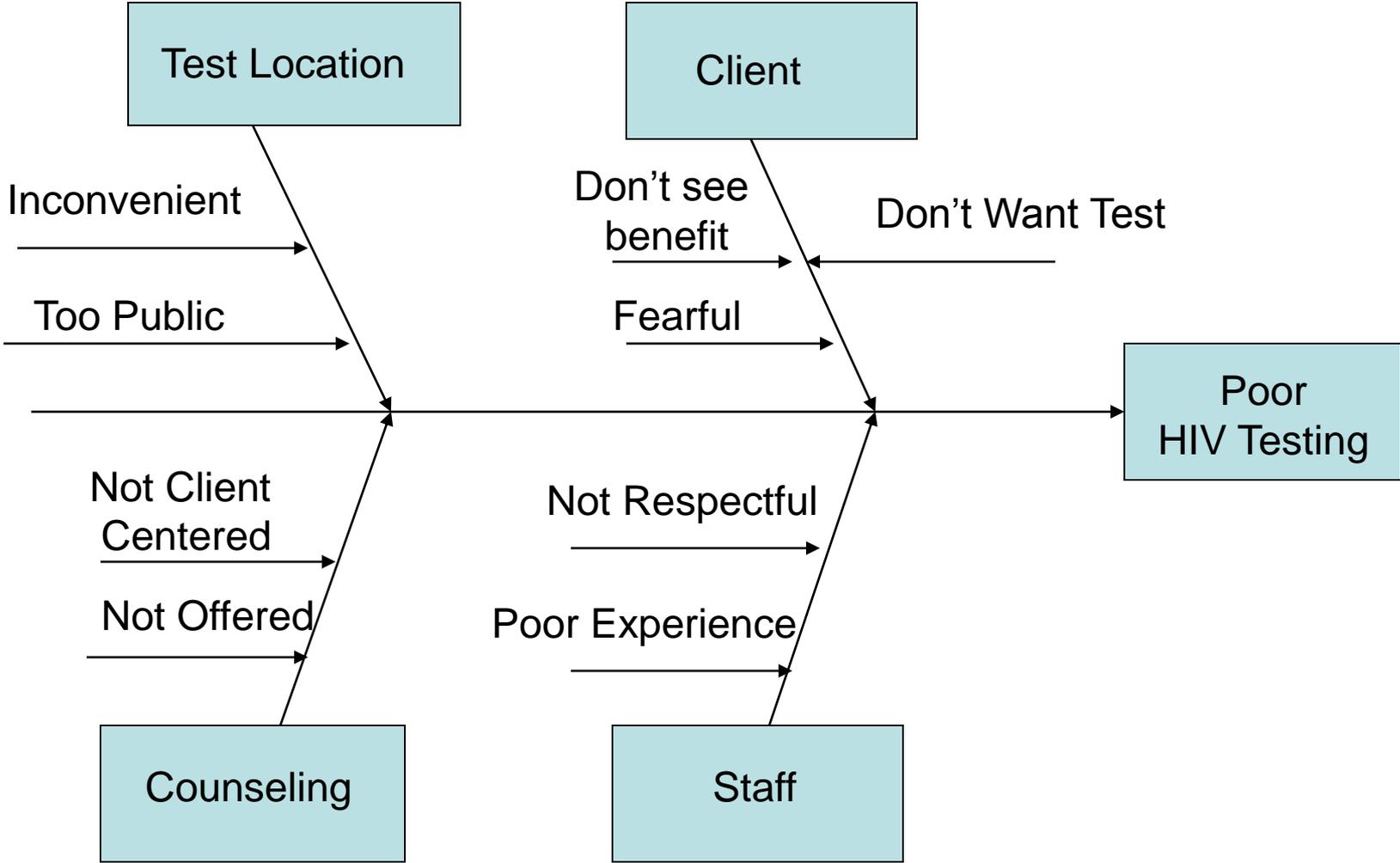
The Basic Tools of QI

- Flow Chart
- Cause and Effect Diagrams
- Pareto Chart
- Check Sheet
- Histogram
- Scatter Diagram
- Control Chart

OSTDS Construction Permit: Site Evaluation Submitted subprocess



Cause and Effect Diagram

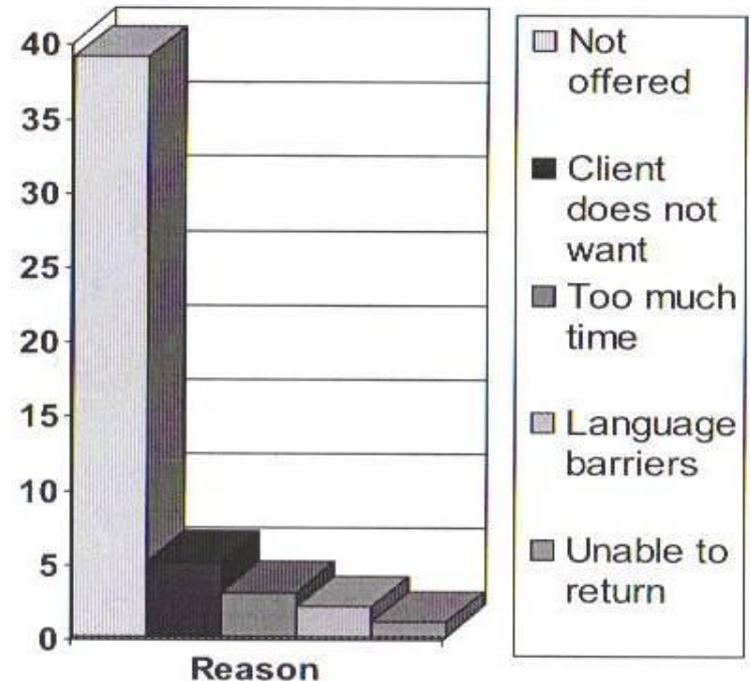


Pareto Principle:

20% of sources cause 80% of any problem

Why do fewer clients in clinic B receive HIV tests?

<u>Reasons</u>	<u>#</u>
Too much time	3
Client does not want	5
Not offered	39
Unable to return	1
Language barriers	2



NC Accreditation Collaborative

**DCHD
Immunization Checklist for the Clinics**

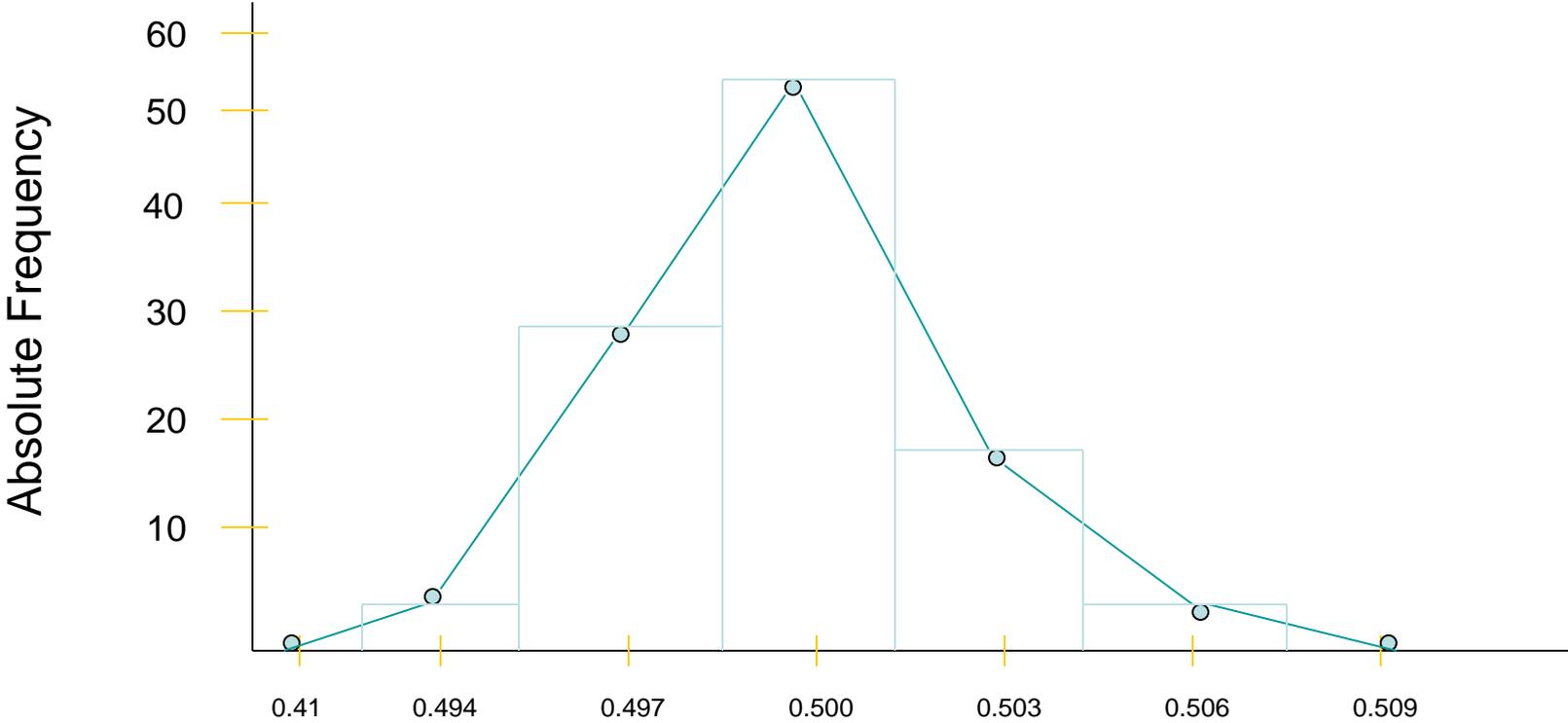
√	Front Desk
	<ul style="list-style-type: none"> ➤ Register patient in HMS ➤ Cross Check for duplicate patients
	<ul style="list-style-type: none"> ➤ Access FL Shots for Patient Information "Search FL Shots" ➤ Ask for address, phone number, and email address (change information if necessary)
	<ul style="list-style-type: none"> ➤ Import updates to HMS ➤ Make sure you have selected the proper Current Immunization Provider (CIP) status is correct in FL Shots
	<ul style="list-style-type: none"> ➤ Print Immunization History from FL Shots attach to Superbill/Chart along with Insurance verification
	Staff Signature
√	RN/LPN/MA/HST
	<ul style="list-style-type: none"> ➤ Greet patient ➤ Assess for needed vaccines ➤ Explain vaccines to be given today ➤ Give VIS to patient/parent ➤ Ask for any questions ➤ Give Injections ➤ Explain after care instructions, invite questions ➤ Document immunization in Florida Shots ➤ Give patient an updated record of shots w/new due date ➤ Tell patient when to return for next vaccinations ➤ Document in medical records
	Staff Signature
√	Billing Clerk
	<ul style="list-style-type: none"> ➤ Process Superbill ➤ Process any collections ➤ Ask did you get your updated record of shots? ➤ Release Client
	Staff Signature

Patient Label

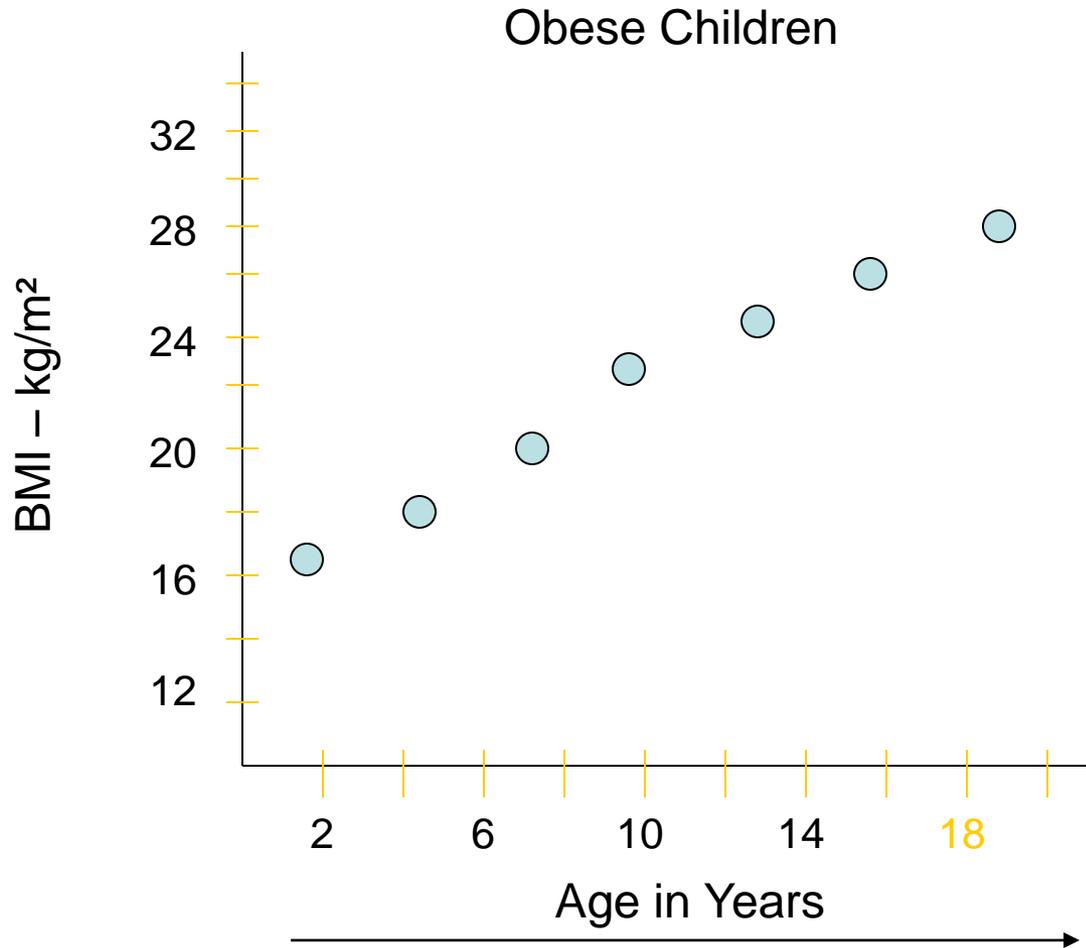
Histogram

Measured In Inches	Tally	Absolute Frequency	Absolute Cumulative Frequency	Relative Frequency	Cumulative Relative Frequency
.506	I	1	100	0.01	1.00
.505	II	2	99	0.02	0.99
.504	IIII	4	97	0.04	0.97
.503	IIII IIII	10	93	0.10	0.93
.502	IIII IIII IIII	15	83	0.15	0.83
.501	IIII IIII IIII III	18	68	0.18	0.68
.500	IIII IIII IIII IIII I	21	50	0.21	0.50
.499	IIII IIII III	14	29	0.14	0.29
.498	IIII III	9	15	0.09	0.15
.497	IIII	4	6	0.04	0.06
.496	I	1	2	0.01	0.02
.495	I	1	1	0.01	0.01

Frequency Polygon & Histogram – Grouped Data



Scatter Plot



Mr. Pareto Head BY MIKE CROSSEN

This data doesn't look so good. We better get this to the boss right away.



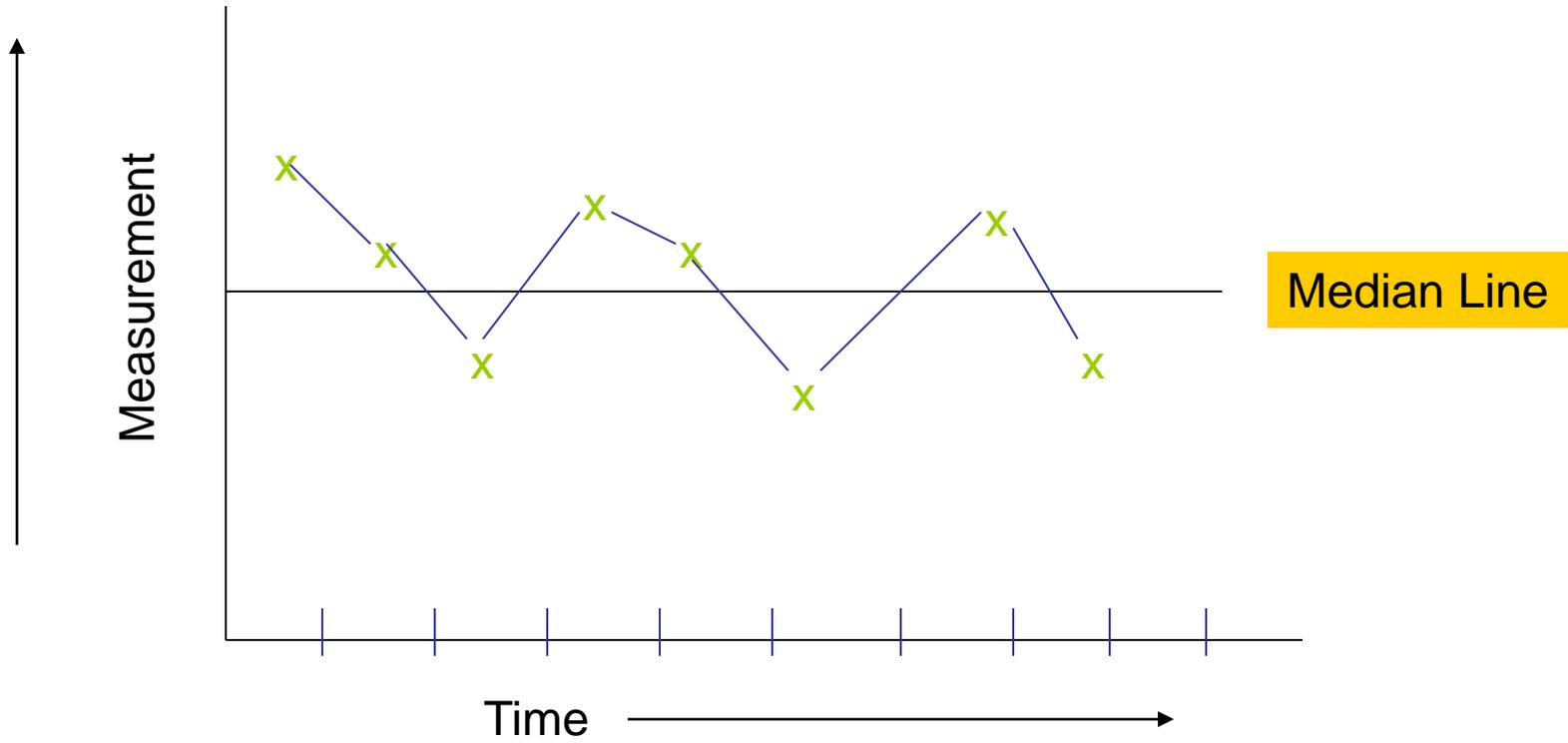
Slide it under the door quietly.



I always wondered why they call it a "Run Chart"!

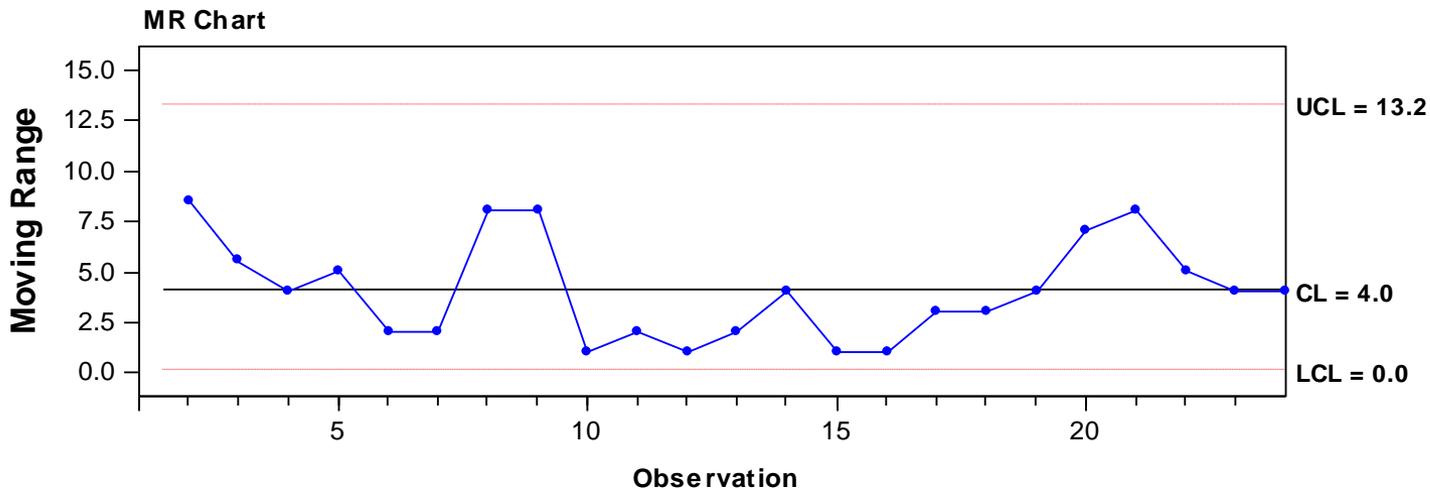
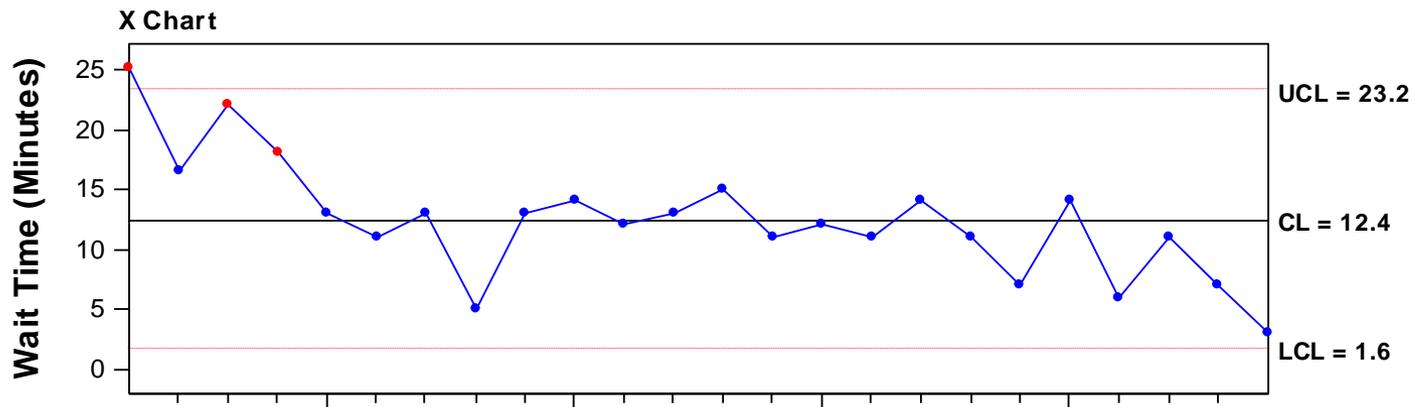


Run Chart



Control Chart

Jones County WIC Lobby Wait Time XMR Chart



The Kano Model

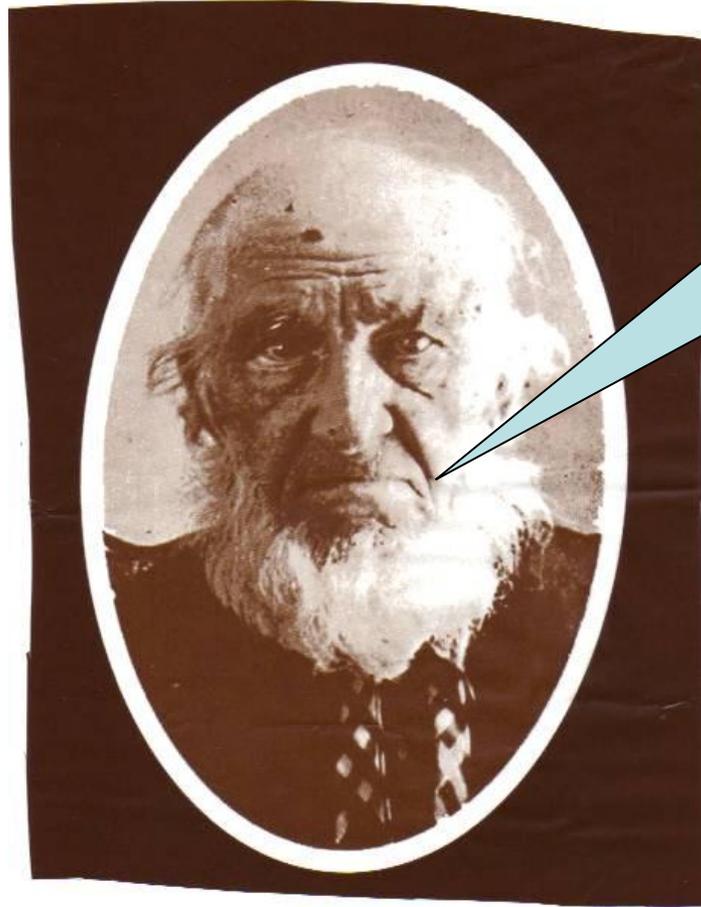
Bose

- Shopping at our store should be enjoyable, exciting and designed for you.

L.L. Bean – Customer Delight

- Unexpected service and attention
 - More than the customer expected
 - More than satisfying the customer
 - Deliver the unexpected
 - Deliver it with enthusiasm and sincerity
 - Surprise the customer
 - Create a memory

Next Door To L.L. Bean is J. L. Coombs - The Oldest Shoe Company in the United States - 1830



“If You Do Not
Like My
Shoes the Hell
with you!”

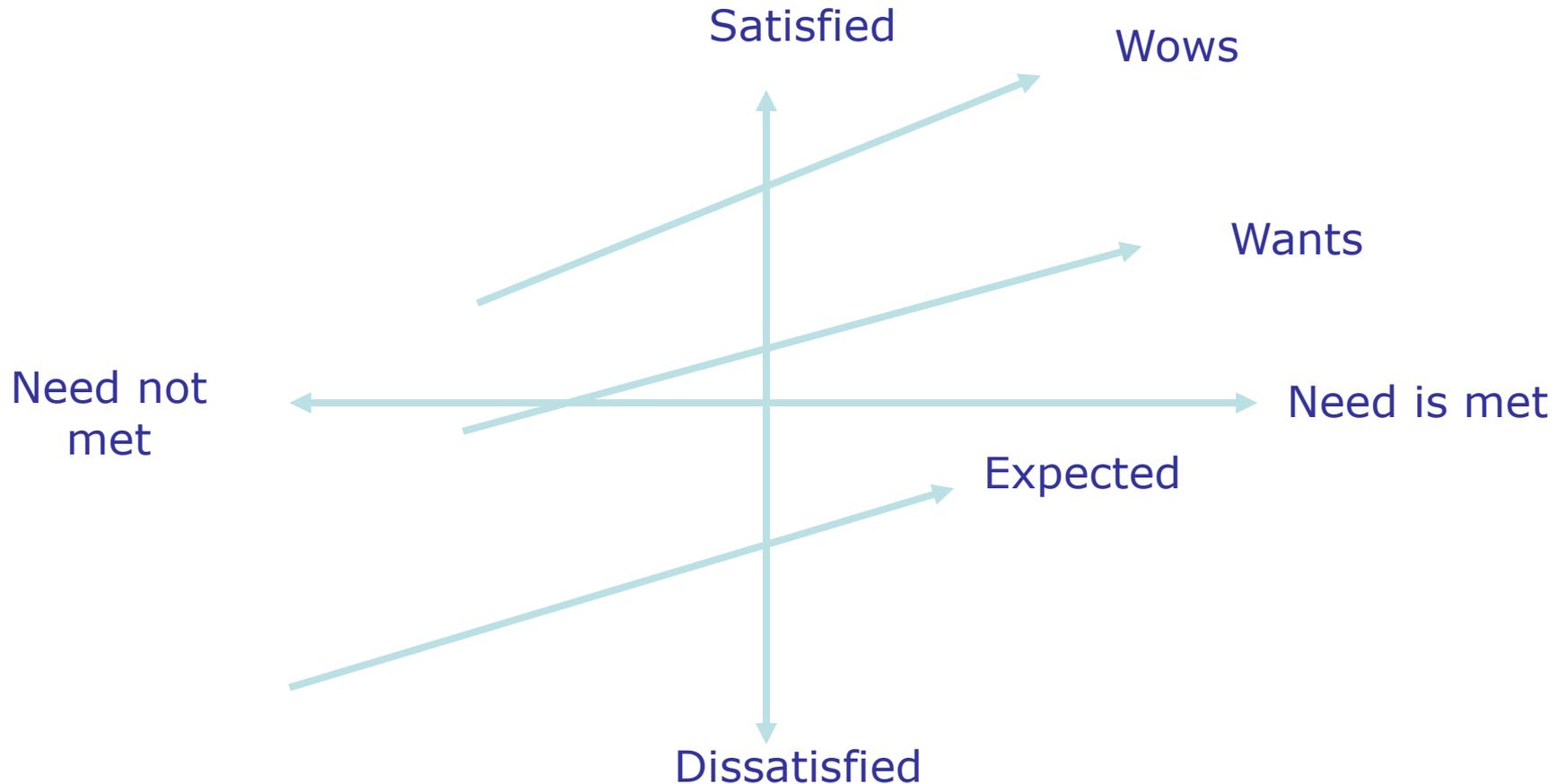
Customer Touch Points

- When your customer (internal/external) comes in touch with your process what do they:
 - See? (Initial reaction?)
 - Feel?
 - Sense?
 - Hear?
 - Experience?

Understanding Your Customer

- Need to obtain the Voice of Your Customer:
 - Wants
 - Needs
 - Satisfiers
 - Dis-satisfiers
 - Future needs and wants

Levels of Customer Satisfaction



Who is Your Customer for Your Issue?

- What are their/your wants and needs?
- What will satisfy them?
- What will satisfy You??
- How can we align our needs??

Flow Charting

“If you can't describe what you are doing as a process, you don't know what you're doing.”

W. Edwards Deming



Flow Charting

- Flow charting is the first step we take in understanding a process
- Organized combination of shapes, lines, and text
- Flow charts provide a visual illustration, a picture of the steps the process undergoes to complete its assigned task
- From this graphic picture we can see a process and the elements comprising it
- Shows how interactions occur
- Makes the invisible visible

Flow Chart Benefits

- Creates a common vision
- Establishes the “AS IS” baseline – Current State
- Baseline to measure improvements
- Identifies wasteful steps – activities/waits
- Uncovers variations
- Shows where improvements could be made and potential impacts
- Training tool

Flow Chart People Benefits

People involved in constructing a flow chart begin to:

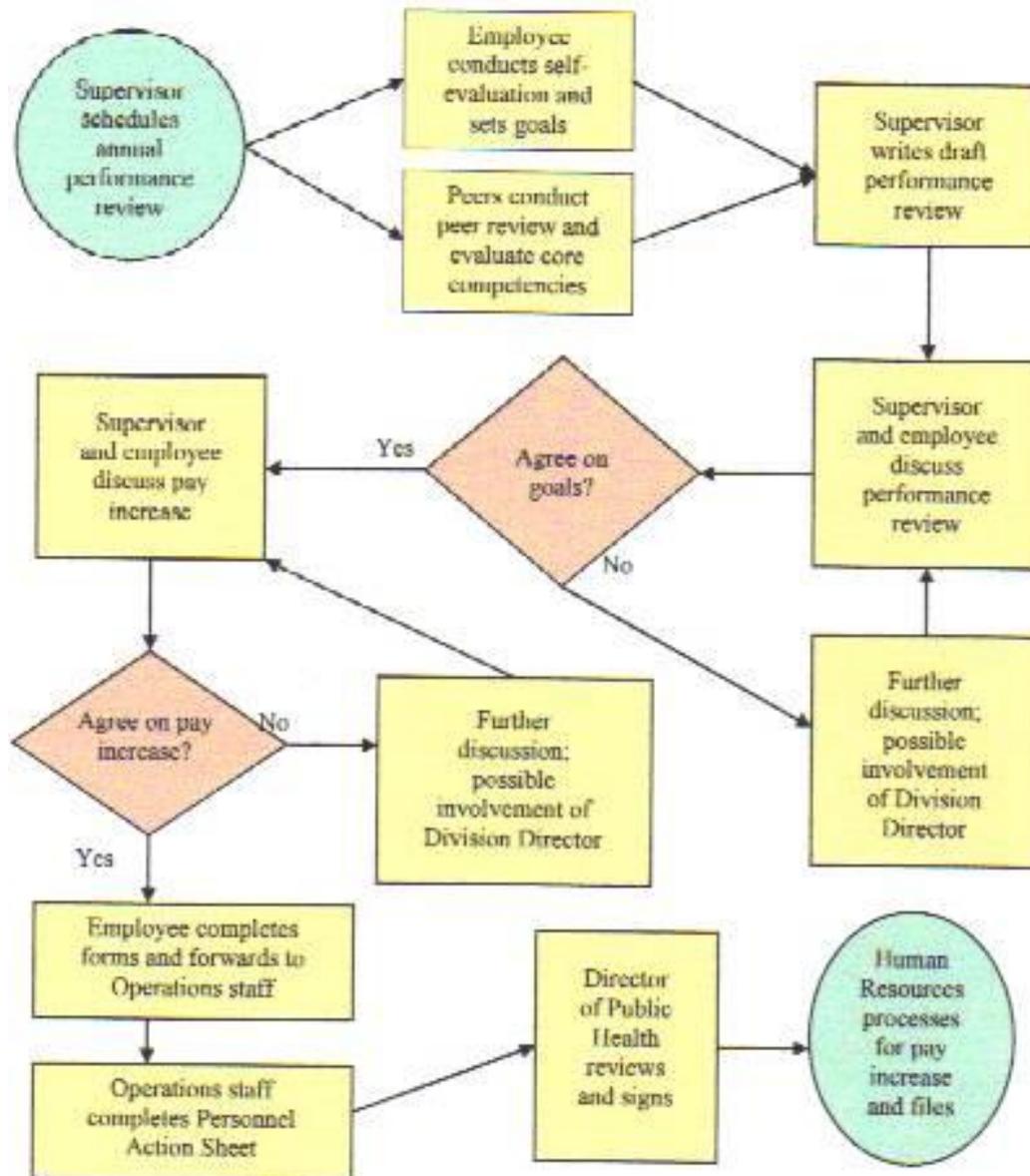
- Better understand the process
- Understand the process in the same terms
- Realize how the process and all the people involved, including them, fit into the overall process or business
- Identify areas for improving the process
- Become enthusiastic supporters to quality and process improvement



Types of Flow Charts

- As Is – current state - baseline
- Could Be – improved state – transition
- Should Be – optimal state

Olmsted County , MN Performance Appraisal Process



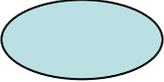
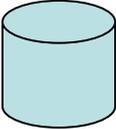
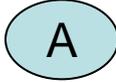
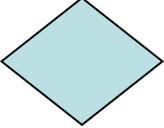
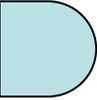
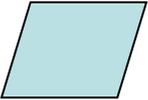
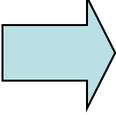
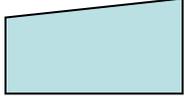
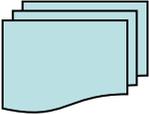
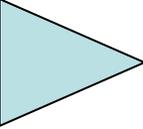
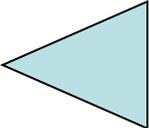
Flow Charting Construction

- Clearly define the process boundaries to be studied
- Define the first and last steps – start and end points
- Get the right people in the room
- Decide on the level of detail
 - Complete the big picture first – macro view
 - Fill in the details – micro view
- Gather information of how the process flows:
 - Experience
 - Observation
 - Conversation
 - Interviews
 - Research
- Clearly define each step in the process
 - Be accurate and honest

Flow Charting Steps

- Use the simplest symbols possible – Post-Its
- Make sure every loop has an escape
- There is usually only one output arrow out of a process box. Otherwise, it may require a decision diamond.
- Trial process flow – walk through people involved in the process to get their comments
- Make changes if necessary
- Identify time lags and non-value-adding steps.

Flow Chart Symbols

	Start/End Bookends		Manual Operation		Flow Lines
	Activity: Operation/Inspection		Data Base		Connector
	Decision		Wait/Delay		Comment Collector
	Input/ Output Data		Storage		Display
	Document		Transport		Manual Input
	Forms		Input		Preparation
			Output		Unfamiliar/ Research

Flow Chart Construction

- Use a form of Post-It Notes – easier to rearrange
- Realize everyone is not doing it the same way – there will be disagreements
- It will take multiple passes to get to the “As Is” State

High Level S I P O C+CM Collection Form

The diagram illustrates a High Level S I P O C+CM Collection Form. It consists of several interconnected boxes:

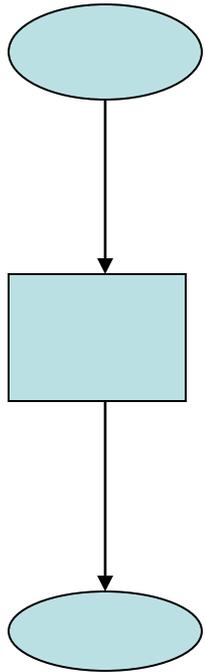
- Begins With:** A box on the top left with an arrow pointing to the Process/Activities box.
- Constraints:** A large box at the top center.
- Process/Activities:** A large central box with arrows pointing to it from 'Begins With' and 'Inputs', and arrows pointing from it to 'Ends With', 'Measures', and 'Outputs'.
- Ends With:** A box on the top right.
- Measures:** A box on the right side, below 'Ends With'.
- Inputs:** A large box on the bottom left.
- Outputs:** A large box on the bottom right.
- Suppliers:** A box on the bottom left, below 'Inputs'.
- Customers:** A box on the bottom right, below 'Outputs'.

Constructing a Flow Chart

- Asking questions is the key to flow charting a process
- For this process:
 - Who is the customer(s)?
 - Who is the supplier(s) ?
 - What is the first thing that happens?
 - What is the next thing that happens?
 - Where does the input(s) to the process come from?
 - How does the input(s) get to the process?
 - Where does the output(s) of this operation go?
 - Is there anything else that must be done at this point?

Adding Time Lines

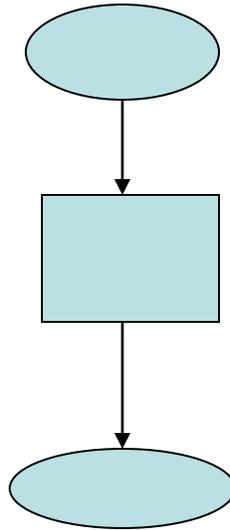
As Is Flow Chart



Time



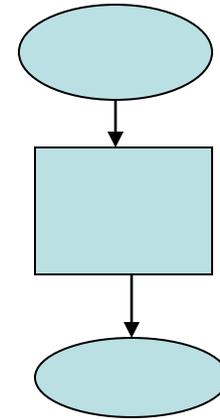
Could Be Flow Chart



Time



Should Be Flow Chart



Analyzing A Flow Chart

Examine each:

- Activity symbol – value/cost?
- Decision point – necessary/redundant?
- Choke Points – bottlenecks?
- Rework loop – time/cost?
- Handoff – is it seamless?
- Document or data point – useful?
- Wait or delay symbol – why?/reduce/eliminate
- Transport Symbol – time/cost/location?
- Data Input Symbol – right format/timely?
- Document/Form Symbol – needed/cost/value?

Flow Chart Summary Matrix

PHF E-News, March 2, 2010, <http://www.phf.org/pmqi/Flow-Chart-Summary-Matrix.pdf>

Flow Chart Step Number	1	2	3	4	5	6	7	8	Actual Σ	Proposed Σ	Delta +/-
Type of Step	P	D	P	T	W	P	D	S			
1. Touch Point (√)											
2. Cost											
3. FTEs/Person Hrs											
4. Supplies Required											
5. Equipment Required											
6. Space Required											
7. Time											
8. Cost of Quality											
8. Partnerships Needed											
9. Etc											
10. Value added											

Type of Step: P – process, D – decision, T – transport, W – wait, S – storage

Delta = Proposed – Actual – the more negative the subtraction the better – more savings



Flow Charting Exercise

Cause and Effect Diagrams

Cause and Effect Diagrams

Moving from Treating Symptoms

To

Treating Causes

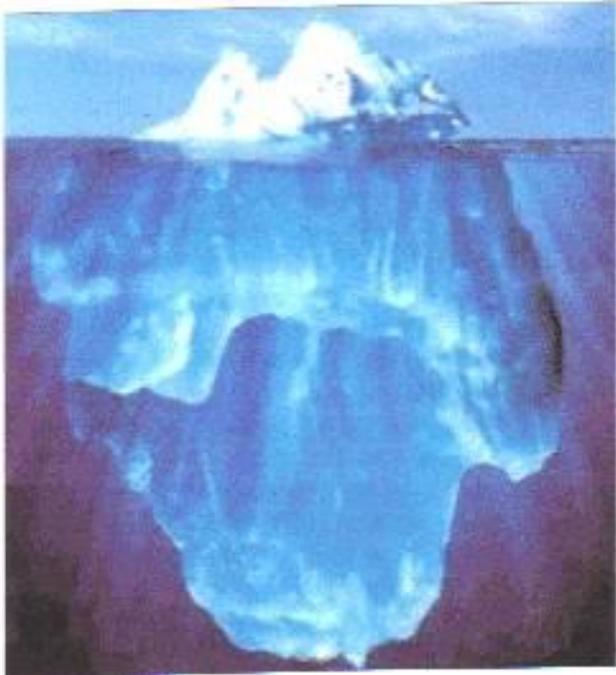
Problem Solving – What we usually see is the tip of iceberg – “The Symptom”

The Symptom →

The Root Causes →

Invisible

Hidden



Problem Solving

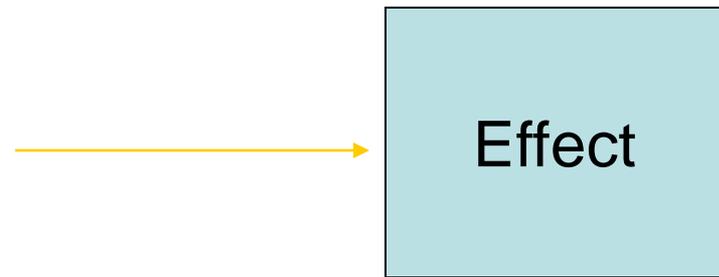
- When confronted with a problem most people like to tackle the obvious symptom and fix it
- This often results in more problems
- Using a systematic approach to analysis the problem and find the root cause is more efficient and effective
- Symptom – sign or indication
- Cause – whatever makes something happen

Cause and Effect Diagrams

- Organizes group knowledge about causes of a problem and display the information graphically
- Resemble a fish skeleton and sometimes called a Fishbone Diagram

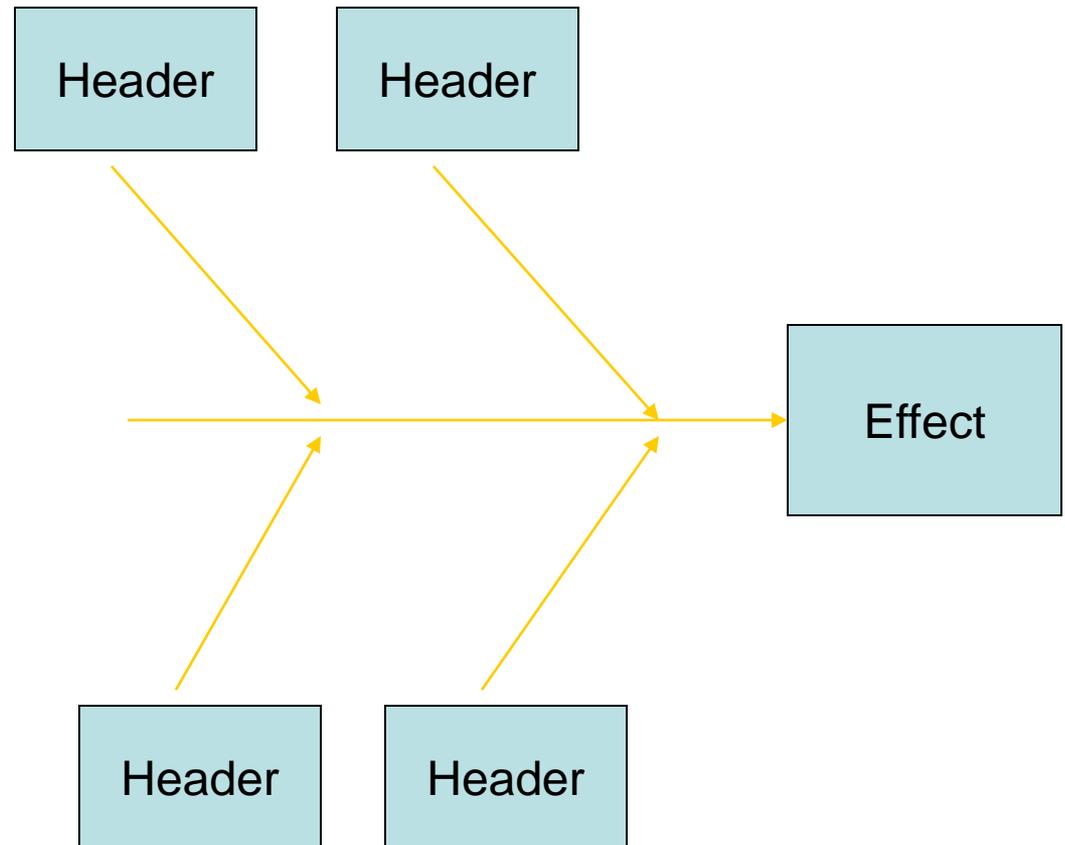
Cause and Effect Diagrams - Construction

- Write the issue as a problem statement on the right hand side of the page and draw a box around it with an arrow running to it
- This issue is now the effect



Cause and Effect Diagrams - Construction

- Generate ideas as to what are the main causes of the effect
- Label these as the main branch headers

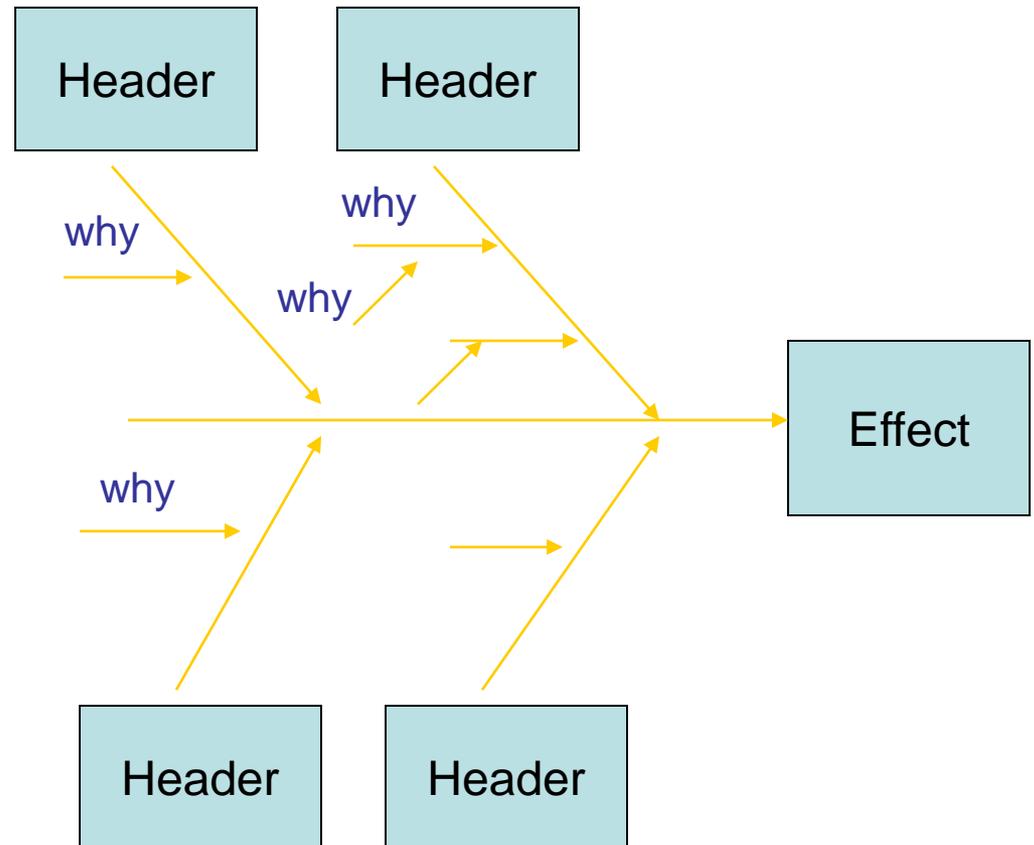


Cause and Effect Diagrams - Construction

- Typical Main Headers are:
 - 4 M's – Manpower, Materials, Methods, Machinery
 - People
 - Policies
 - Materials
 - Equipment
 - Life style
 - Environment
 - Etc

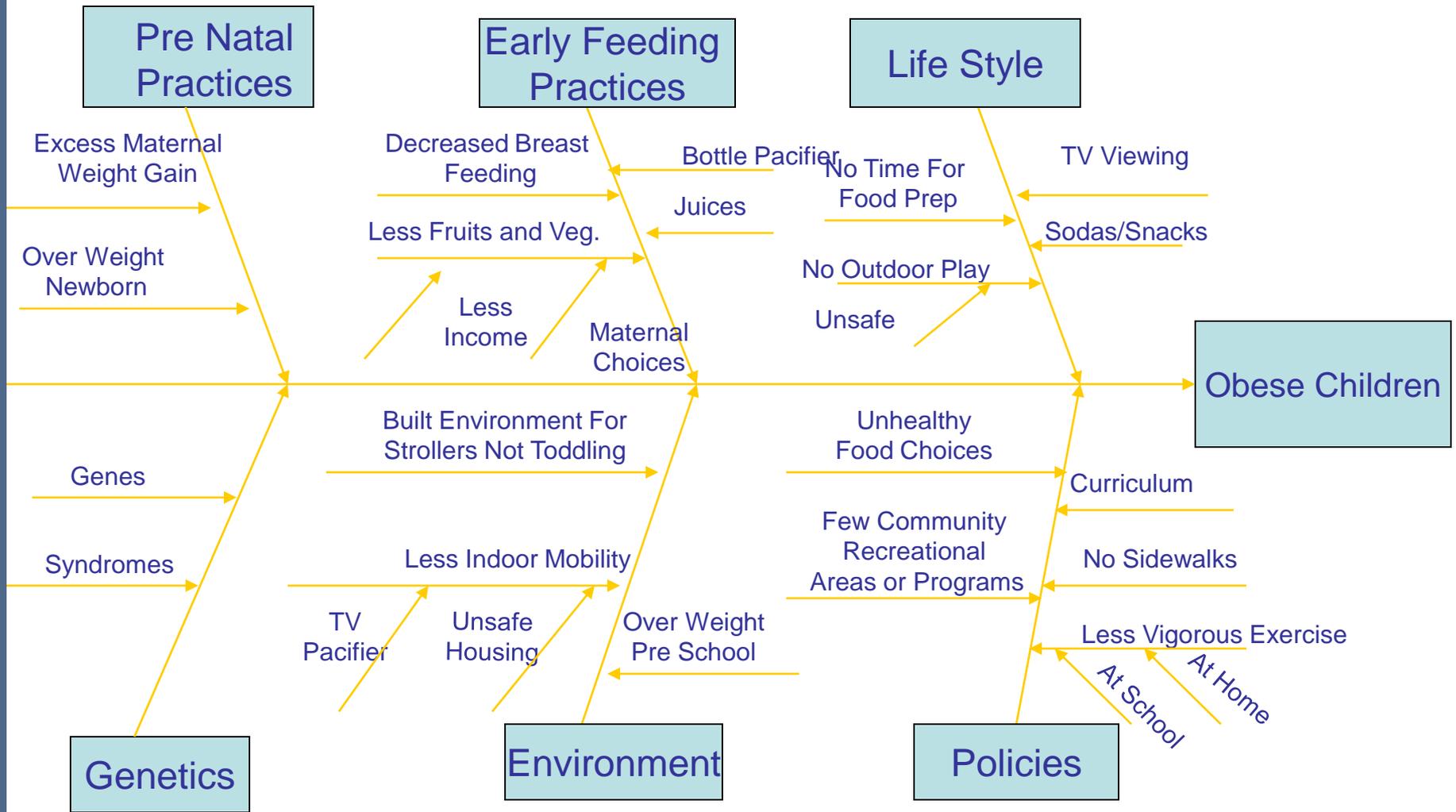
Cause and Effect Diagrams - Construction

- For each main cause category brainstorm ideas as to what are the related sub-causes that might effect our issue
- Use the 5 Why's technique when a cause is identified
- Keep repeating the question until no other causes can be identified
- List the sub-cause using arrows



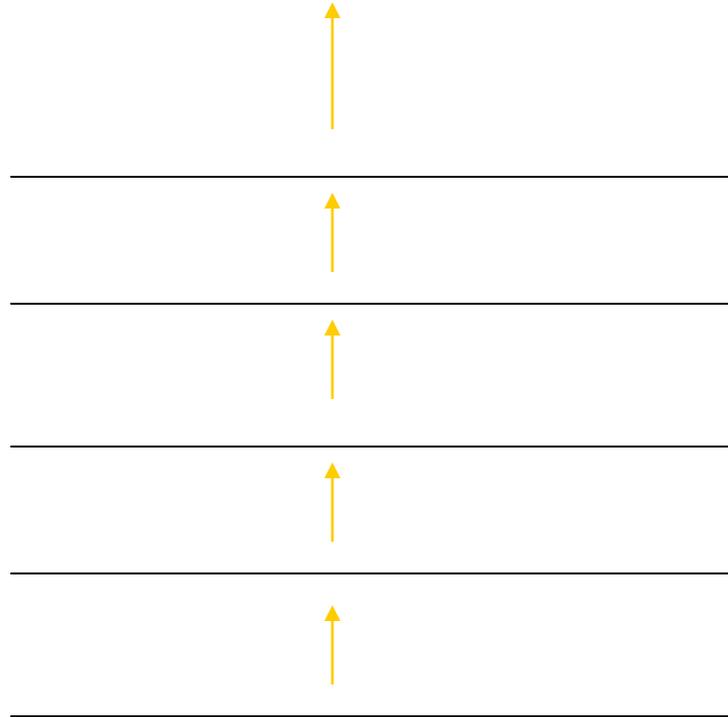
Selecting Items to Investigate

- When the Cause and Effect Diagram is finished it is time to decide what few areas should be focused on to develop solutions to solve the effect
- Some are obvious – low hanging fruit
- Some require some research using the other QI tools such as:
 - Pareto Diagrams
 - Run Charts
 - Surveys
 - Histograms
 - Etc.



5 Why's Technique

Problem (Effect)



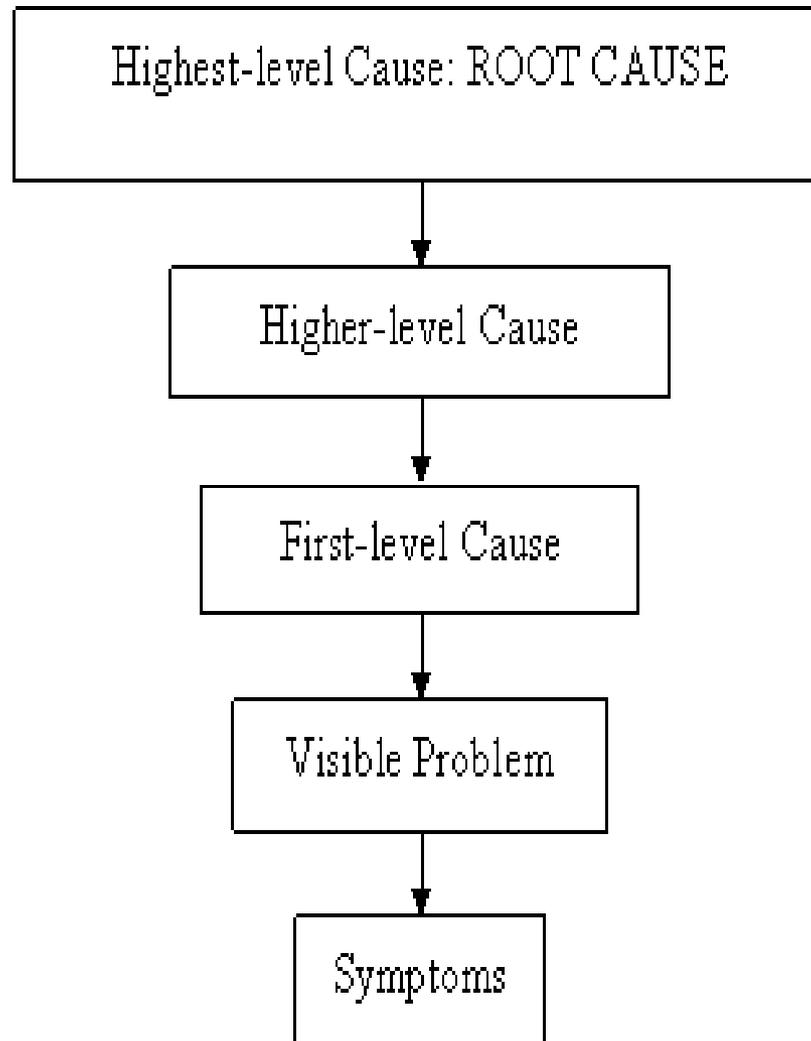
Why?

Why?

Why?

Why?

Why?



Root Cause Analysis Rating Form

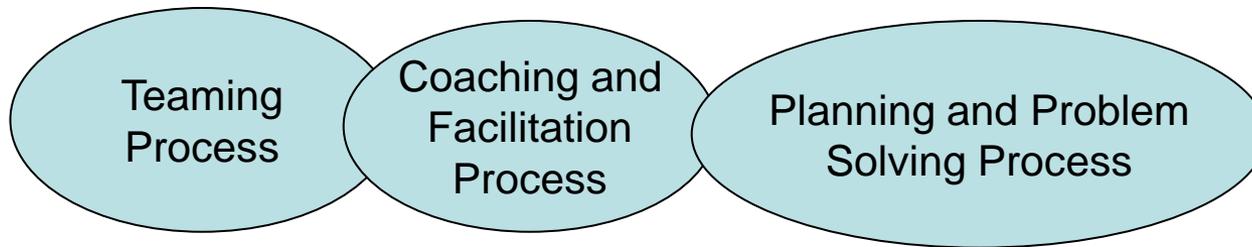
Potential Root Cause	Impact on the Problem				Total Score	Ranking
	Improved Quality	Reduced Costs	Improved Customer Satisfaction	Others		

Impact Scoring Scale: Low = 1, Medium = 3, High = 5



Cause and Effect Exercise

Three Step Process for Healthy Teams

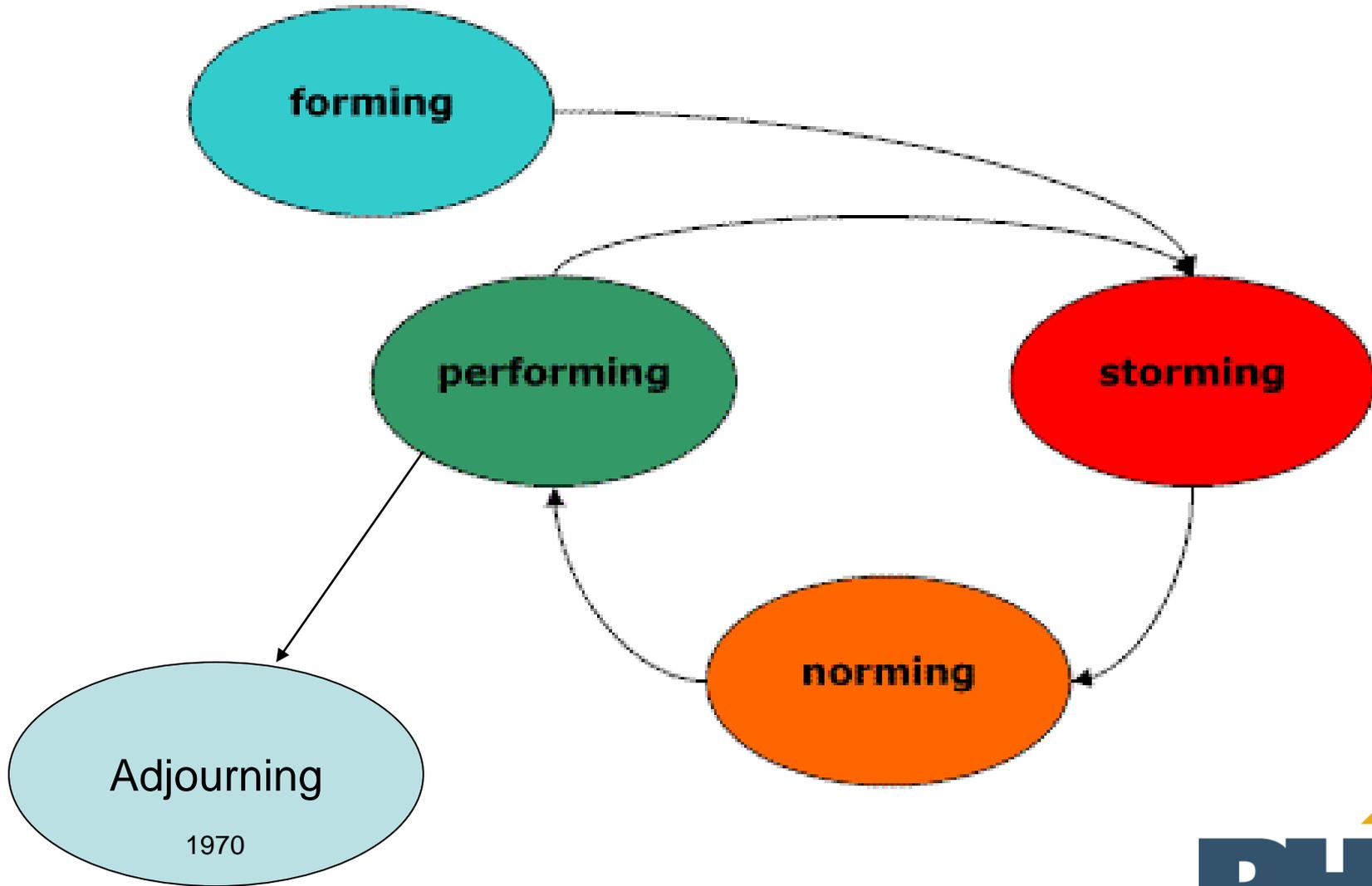


Top Ten Reasons Teams Fail

1. **AIM Statement**
2. **Team Charter**
3. **Team Members**
4. **Problem Solving Process**
5. **Rapid Cycle**
6. **Team Maturity**
7. **Base Line Data**
8. **Training**
9. **Root Cause Analysis (RCA)**
10. **Pilot Testing**



Stages Of Team Development



Bruce Tuckman, 1965



> Q&A

> Thank You for your time and attention

