AQS200 – Root Cause
Exercise 9c
Problem Cause Data Analysis – Affinity Diagram
Name: _____   Date: _____

The ZZ-400 manufacturing team has been tasked to create performance indicators for their department. The performance indicators will be reported monthly and will provide insight to the productivity of their group.

A brainstorming session was conducted to come up with a list of ***potential performance indicators.*** The results are listed in Table 1 below.   f step 2. Using a whiteboard write the topic to be analyzed in large letters at the top of the board:

Create an Affinity Diagram -   STEPS

Topic: "Potential Performance Indicators for the ZZ-400 manufacturing team"

1. Take the potential performance indicators from Table 1 and write them on adhesive notes. Then attach the notes to the board in a totally random pattern.

Possible Performance Measures	
% purity	# of OSHA recordables
% trace metals	# of customer returns
Maintenance costs	Customer complaints
# of emergency jobs	Overtime/total hours worked
lbs. produced	$/lb. produced
Environmental accidents	Raw material utilization
Material costs	Yield
Overtime costs	Utility cost
# of pump seal failures	ppm water
Viscosity	Color
Cp_k values	Service factor
Safety	Time between turnarounds
Days since last lost-time	Hours worked/employee
% rework or reject	lbs. waste
Hours downtime	Housekeeping score
% uptime	% capacity filled

Table 1 Brainstorming for Affinity Diagram Example

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2. In silence, without any discussion, the group moves the notes around trying to form groups of potential performance indicators that are related. Usually the notes are moved many times before they find their places. This may take up to an hour depending on the number of ideas.

3. After grouping the potential performance indicators, the participants discuss the final shape of the chart. As the motives for placing notes are explained, minor movements should be allowed. The total number of groups should not exceed five to ten.

4. Create titles for the groups, dividing larger groups into subgroups at lower levels.

5. Finalize the chart by drawing boxes around the groups and possibly adding arrows between them to indicate additional relationships.

6. Evaluate the chart with regard to further efforts. The groups contain elements and suggestions of potential performance indicators that affect one another and must be seen in connection when devising solutions.

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PROPOSED PERFORMANCE MEASURES

PRODUCT QUALITY

% purity	% trace metals

Color	Viscosity	ppm water
Cp_k values	Customer complaints	% rework or reject

# of customer returns

MAINTENANCE

Maintenance costs	# of emergency jobs

# of pump seal failures	Hours downtime	% uptime

Service factor	Time between turnarounds

MANUFACTURING COST

Overtime costs	$\dfrac{\text{Overtime}}{\text{Total hours}}$	Raw material utilization

Maintenance costs	Material costs

Yield	Utility costs	$ per lb. produced

$\dfrac{\text{Hrs worked}}{\text{Employee}}$

SAFETY AND ENVIRONMENTAL

# of OSHA recordables	Days since last lost-time	lbs. waste

Environmental accidents	House-keeping score

VOLUME

lbs. produced	% capacity filled