School of Mechanical Engineering

Course Code: BTME4006 Course Name: Quality and reliability engineering

UNIT 1

Quality Improvement Tools

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Quality Improvement Tools

Brainstorming

Nominal Group Technique



Cause & Effect

Flow Diagram

Brainstorming



- Everyone participates
- Go round robin and only one person speaks at a time
- No discussion of ideas
- There is no such thing as a dumb idea
- Pass when necessary
- Use "BIG" yellow sticky notes and write only 1 idea per sticky note
- One person assigned as scribe
- For a complicated issue, the session could last 30-45 minutes...or longer!

Nominal Group Technique



Use a Nominal Group Technique To focus brainstorming results

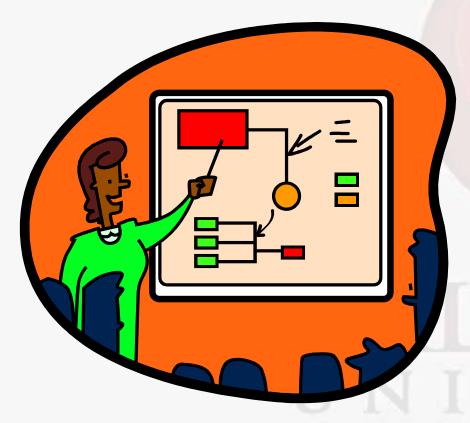
An internet search on

"Nominal Group Technique"

Will yield many examples and methods to apply this technique

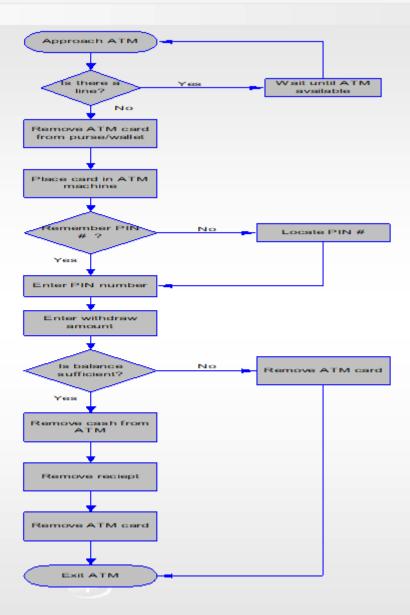
Flow Diagrams

Why is flow diagramming helpful?



- Build a common understanding of a whole process
- Develop process thinking
- Improve a process
- Standardize a process

Flow Diagram of an ATM Withdraw



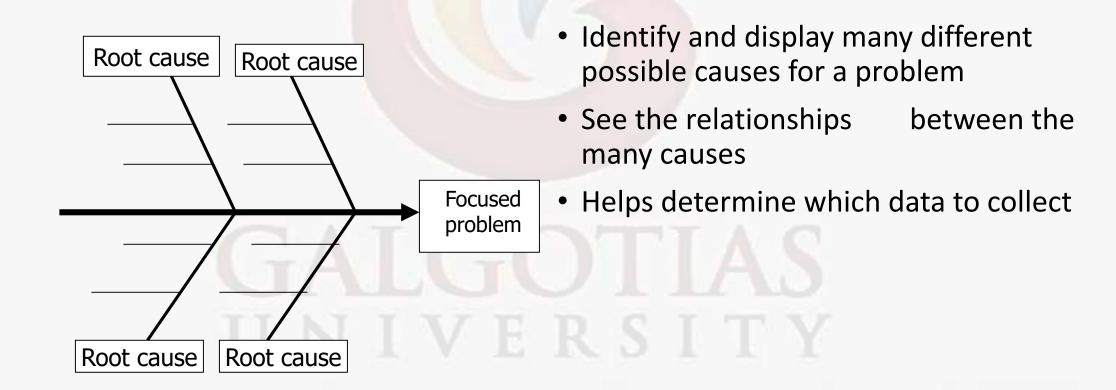
Investigate the Root Causes

Understand the root causes of a problem BEFORE you put a "solution" into place



Cause & Effect Diagrams

Why are cause and effect diagrams helpful?

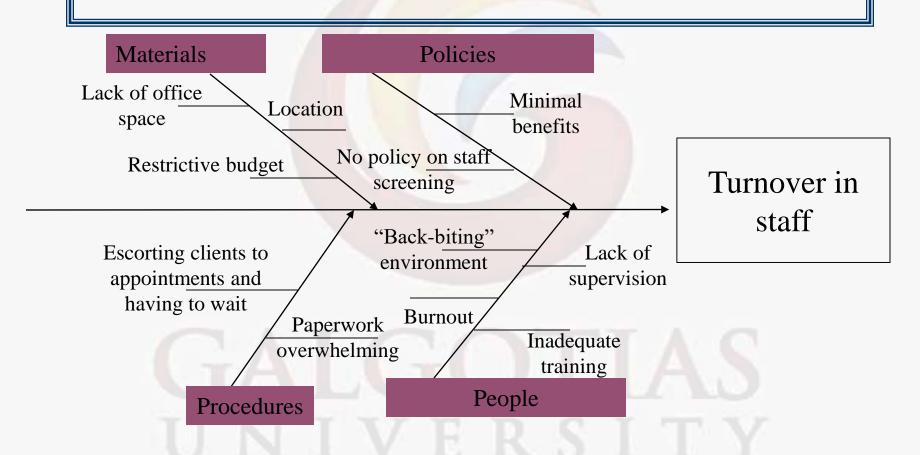


How To Construct Cause & Effect Diagrams

- •Clearly define the focused problem
- •Use brainstorming to identify possible causes
- •Sort causes into reasonable clusters (no less than 3, not more than 6)
- •Label the clusters (consider people, policies, procedures, materials if you have not already identified labels)
- •Develop and arrange bones in each cluster
- •Check the logical validity of each causal chain

Brainstorm Results

Building a Cause & Effect Diagram



Cause & Effect Diagrams

- Bones should not include solutions
- Bones should not include lists of process steps
- Bones include the possible causes

Better understand the current situation.....

Now begin to develop a change.

To Summarize....

- Brainstorming
- Nominal Group Technique
- Flow Diagram
- Cause & Effect Diagram



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References

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