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Improve Phase
Did the process Improve?

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Control Chart Advantages

- Systematic and efficient method for turning data into actionable information
- Lets people make decisions from FACTS
- Highlights special cause impacts to a process
- Provides warning of degradation before making defect products / services
- Establishes controls for continuous improvement and shows evidence of improvements
- Involves everyone and builds worker knowledge of the process

Exercise: What Does the Data Say?

- Each of the following 10 examples contain presentations of data “before” and “after” an improvement project was conducted.

- For each example, answer the question:

  Did the process improve?

- You may answer …

  YES, NO or **CAN’T TELL**

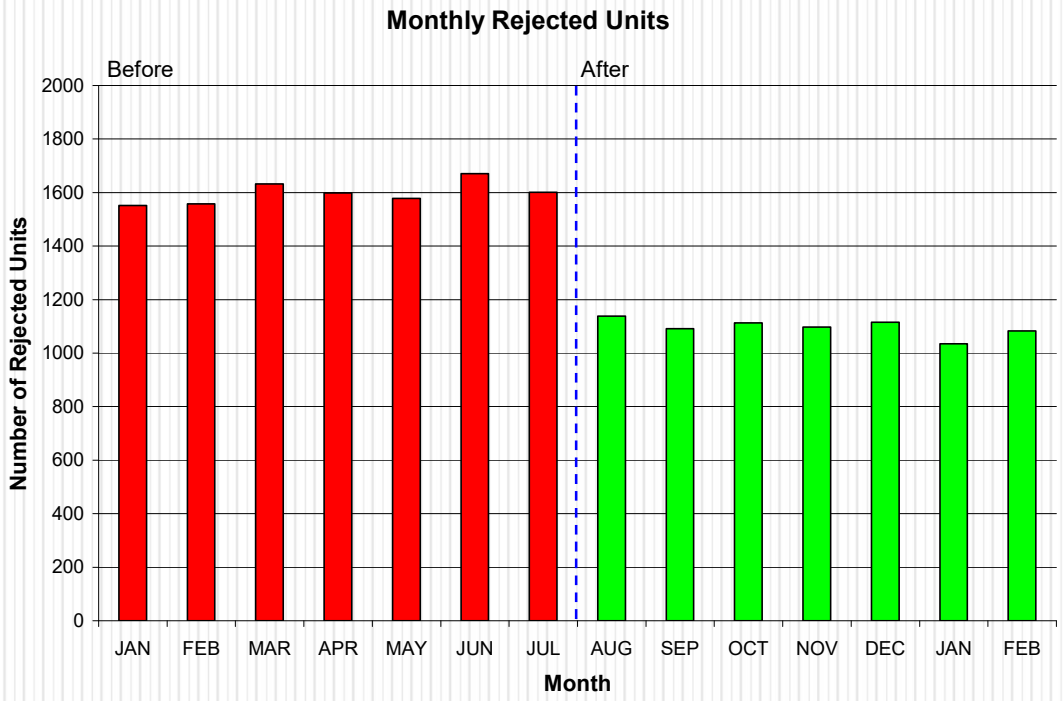
Did the Process Improve?

For each example, did the process improve?

Example	Yes	No	Can't Tell
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Did the Process Improve? Example 1

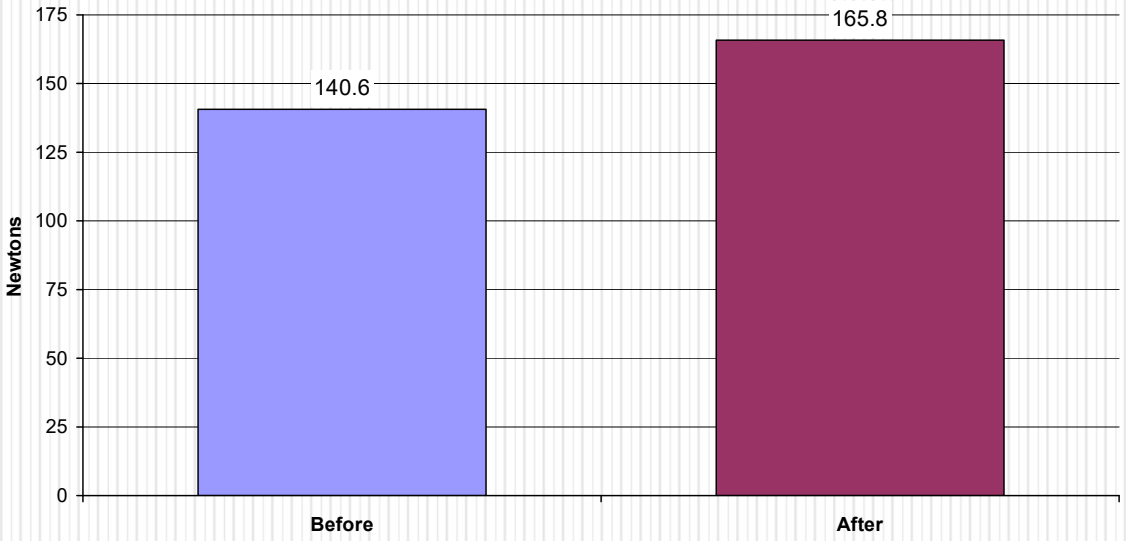
Example 1: Monthly rejects before and after an improvement project



Did the Process Improve? Example 2

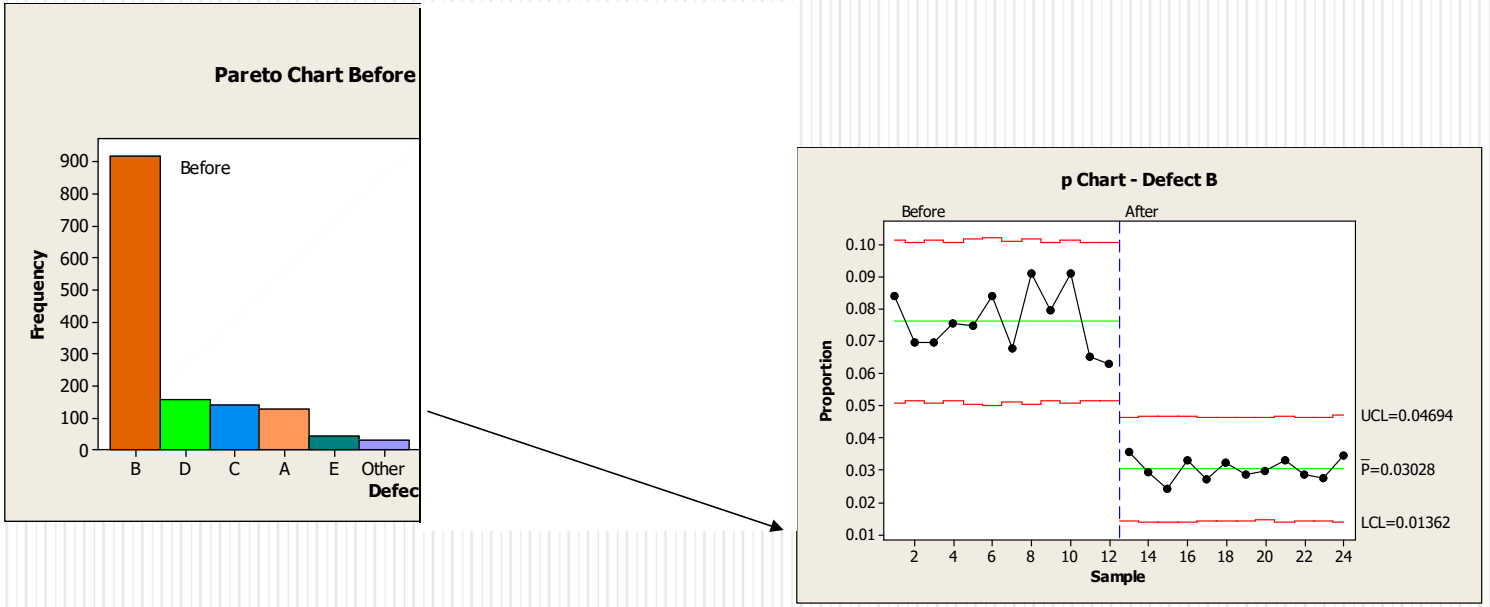
Example 2: Adhesion strength in Newtons before and after an improvement project

(Larger values are better.)



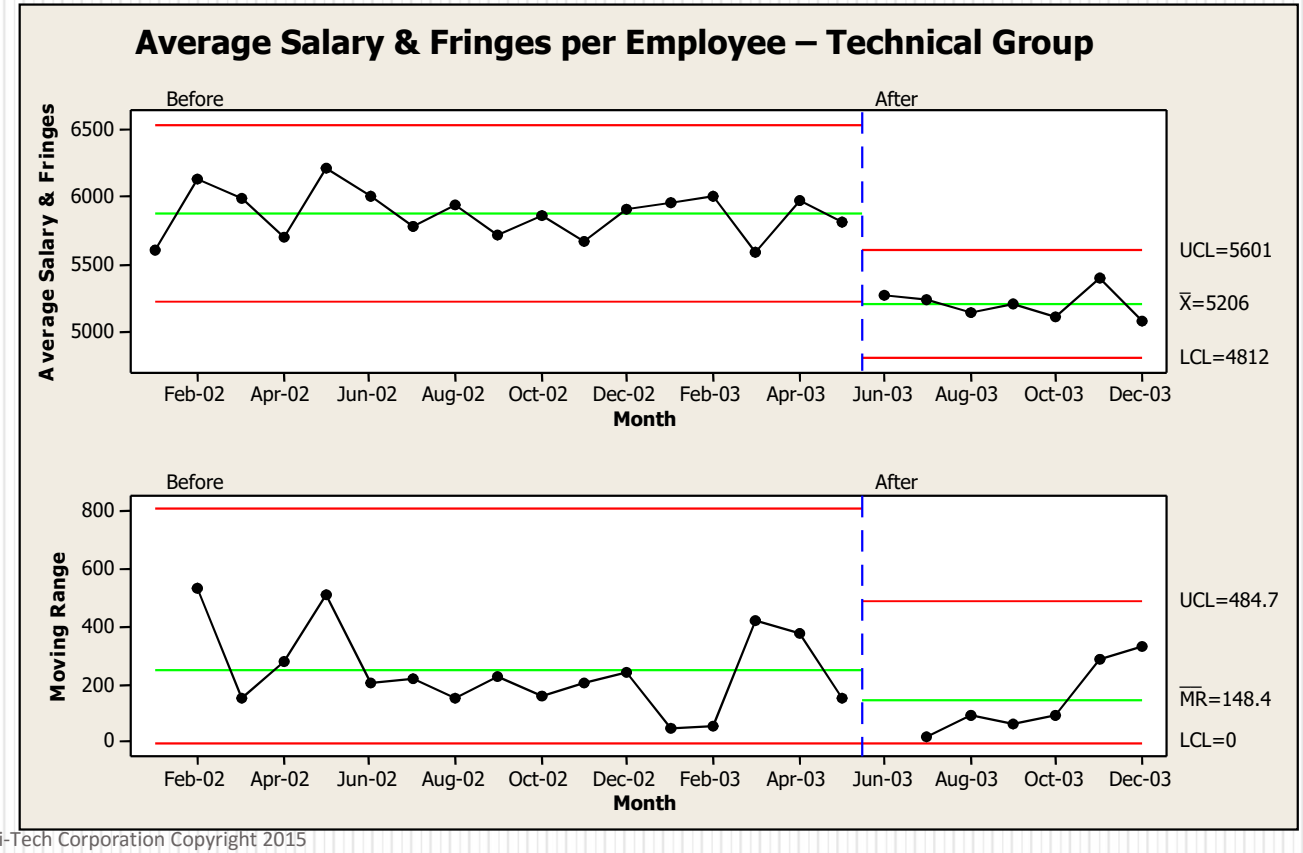
Did the Process Improve? Example 3

Example 3: Defects before and after an improvement project

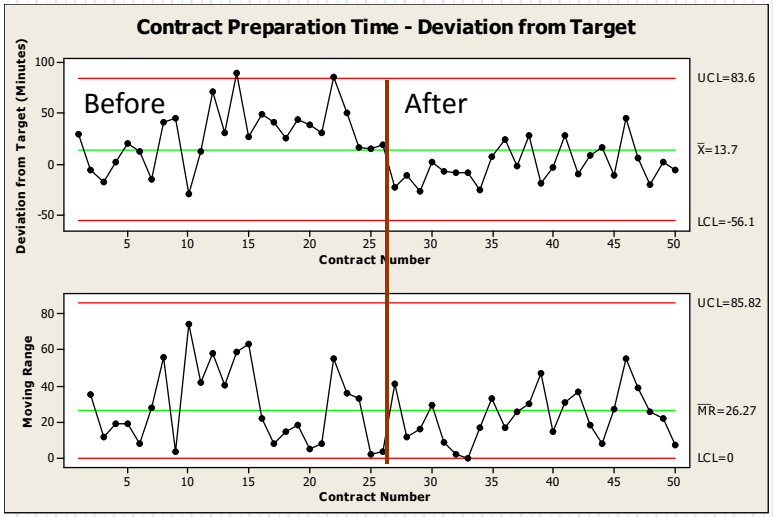


Did the Process Improve? Example 4

Example 4: Labor Cost before and after an improvement project

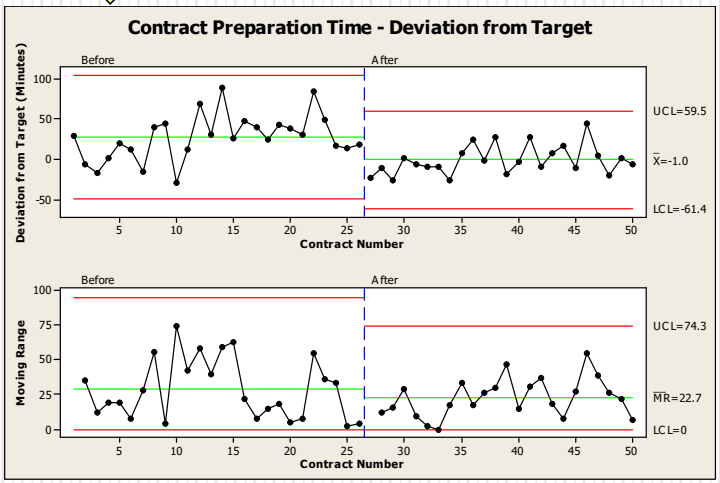


Did the Process Improve? Example 5



Example 5: Contract Preparation Time – Deviation from Target

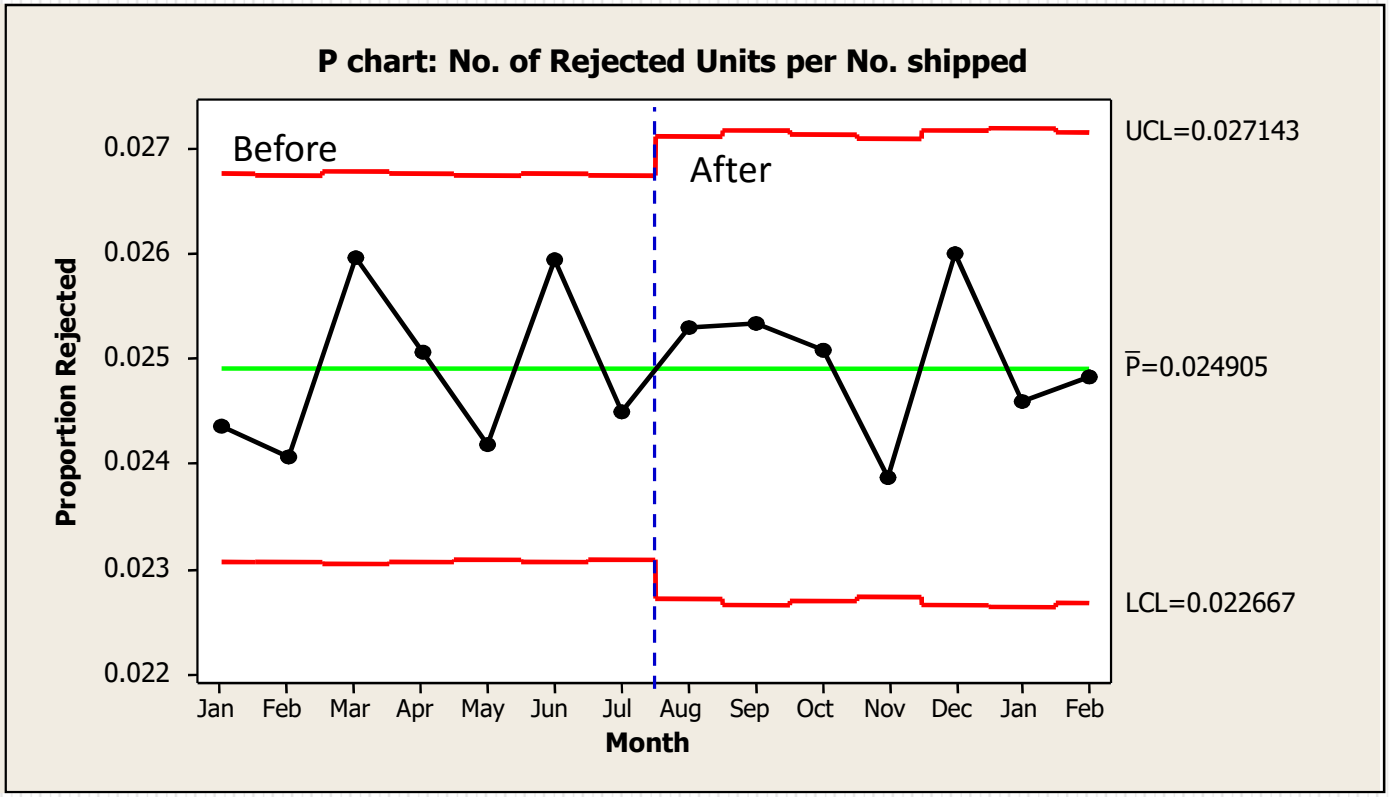
Same data, with control limits computed separately for "Before" and "After" data.



- **Contracts are rated according to complexity.**
- **A contract rated "A" is the least complex, "B" is moderately complex and "C" is most complex.**
- **A target preparation time is established for each type of contract. The deviation from the target is measured and charted in these graphs.**
- **The first 26 points show baseline (contract preparation time before the improvement project was conducted).**

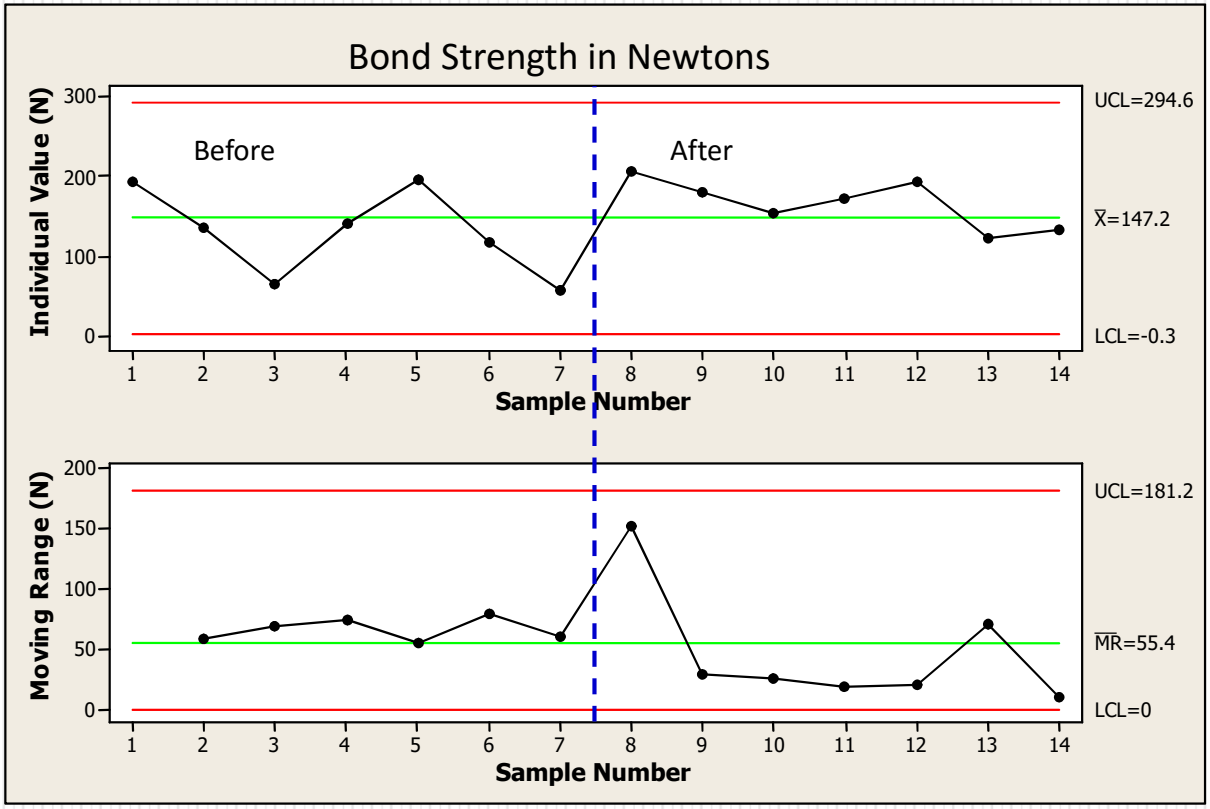
Did the Process Improve? Example 6

Example 6: Rejected Units before and after an improvement project



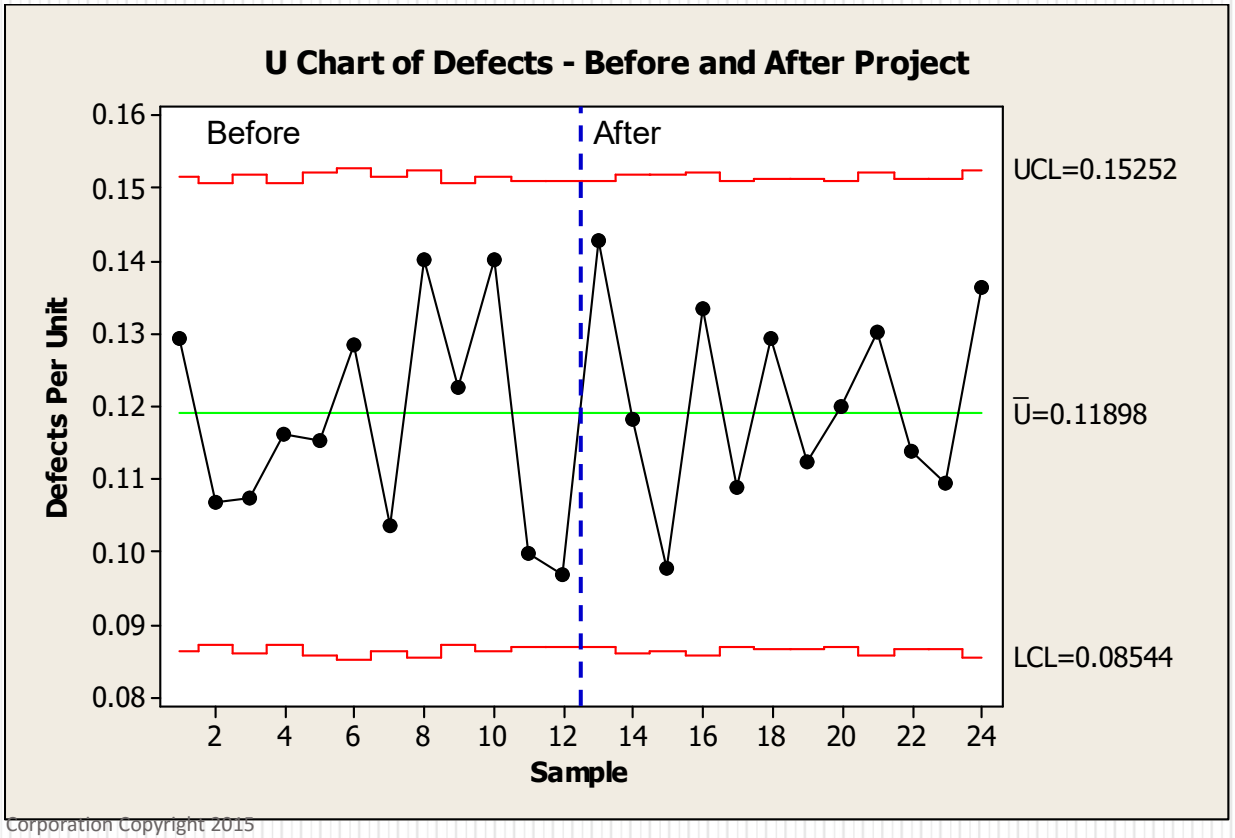
Did the Process Improve? Example 7

Example 7: Bond Strength before and after an improvement project



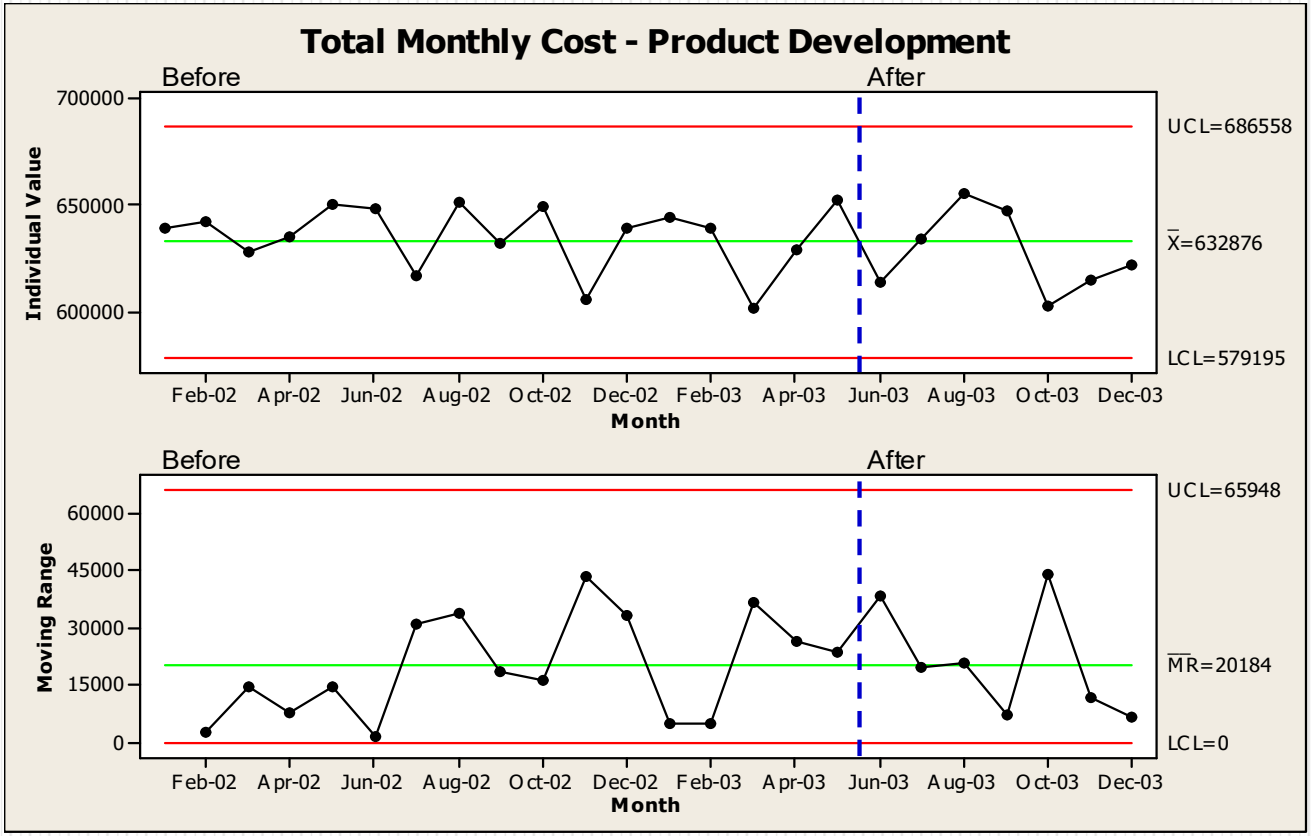
Did the Process Improve? Example 8

Example 8: Defects per Unit before and after an improvement project



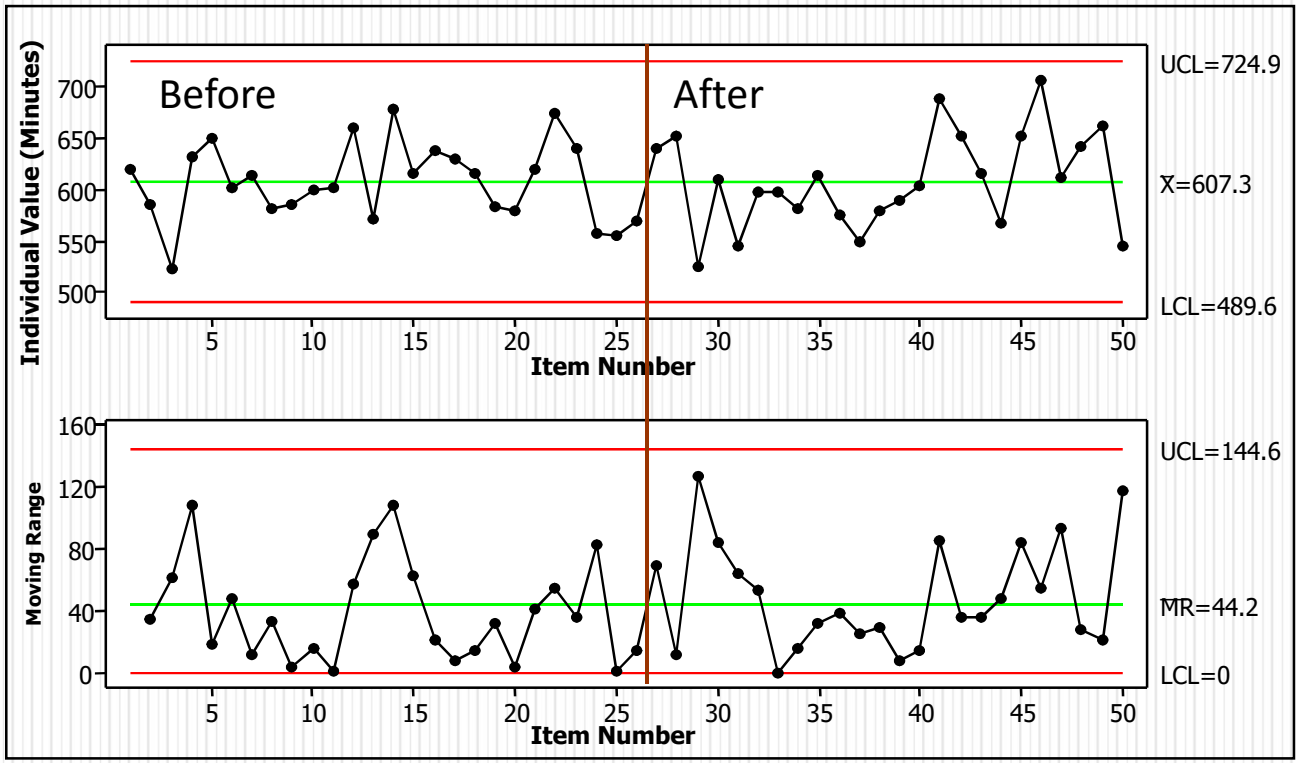
Did the Process Improve? Example 9

Example 9: Total Cost before and after an improvement project



Did the Process Improve? Example 10

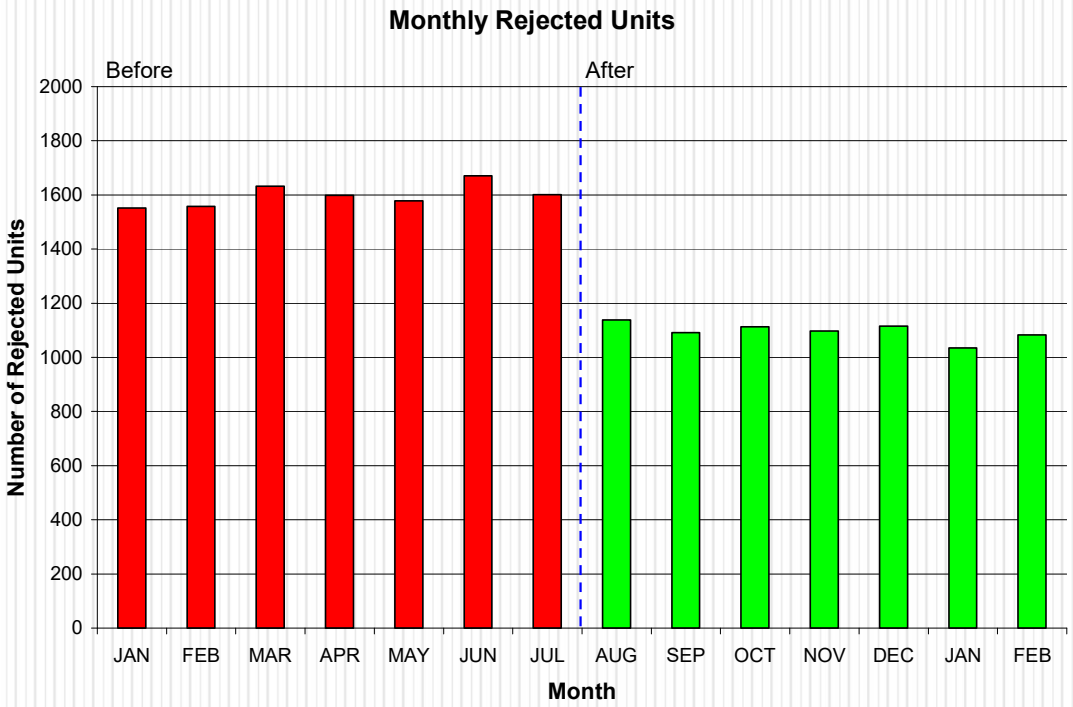
Example 10: Cycle Time



Solutions

Did the Process Improve? Example 1

Example 1: Monthly rejects before and after an improvement project

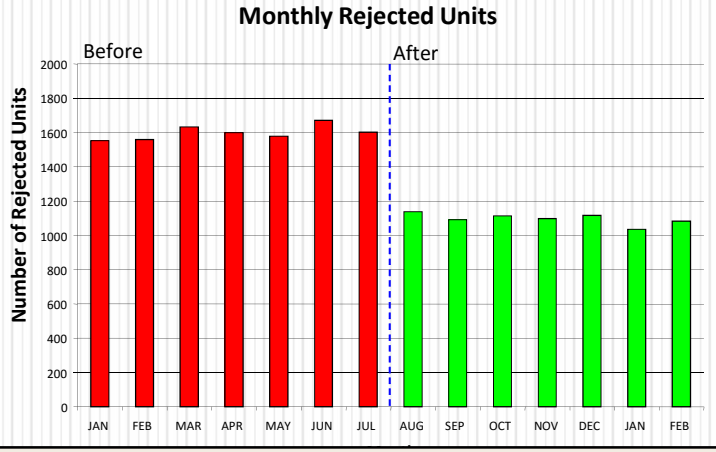


Did the Process Improve? Example 1 and 6

Example 1:

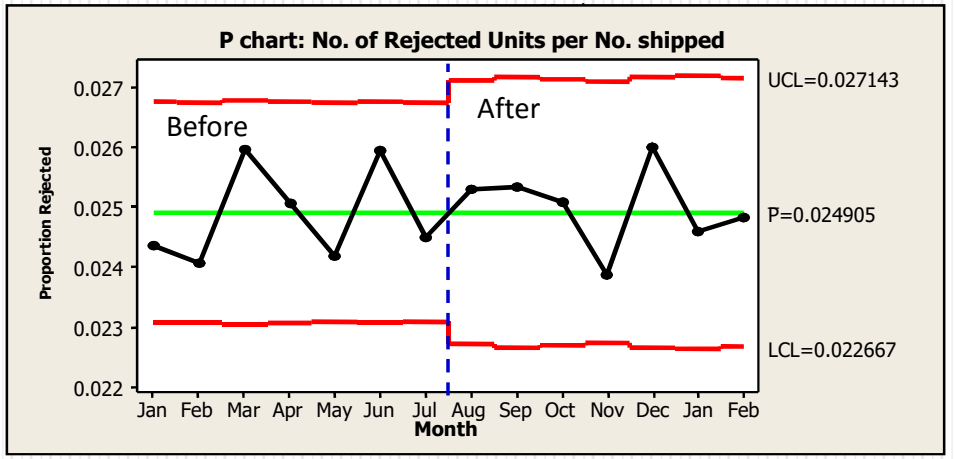
Monthly rejects before and after an improvement project

Same data!



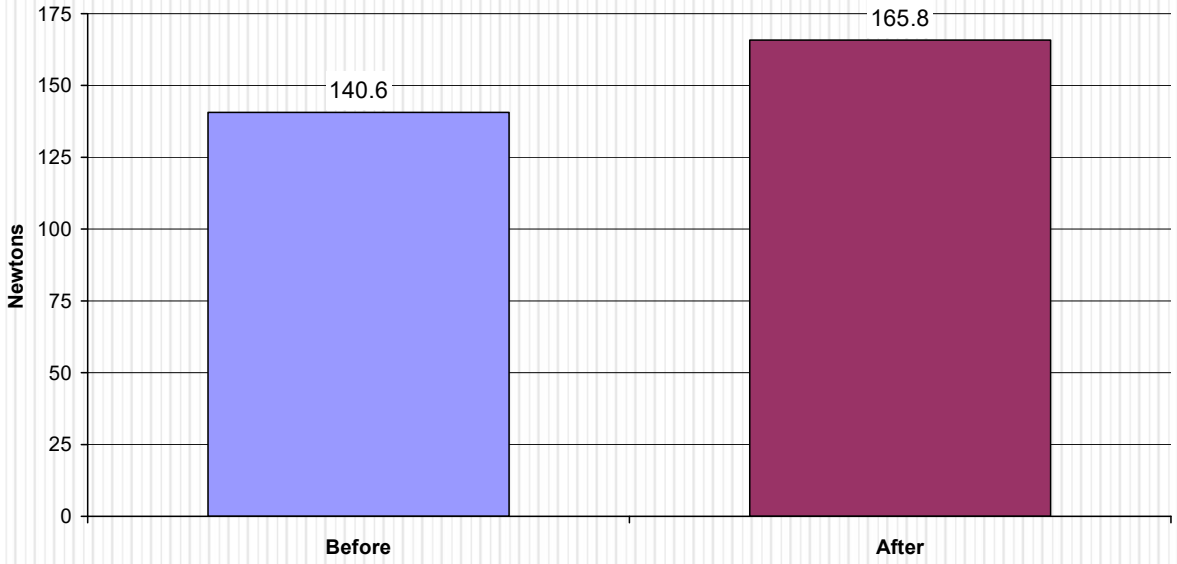
Example 6:

Rejected Units before and after an improvement project



Did the Process Improve? Example 2

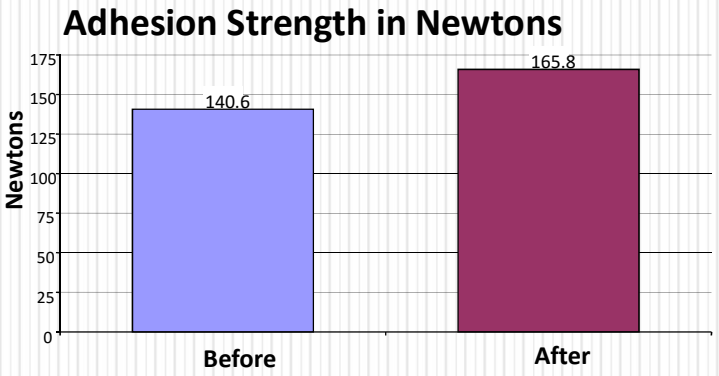
Example 2: Adhesion strength before and after an improvement project
(Larger values are better.)



Did the Process Improve? Example 2 and 7

Example 2:

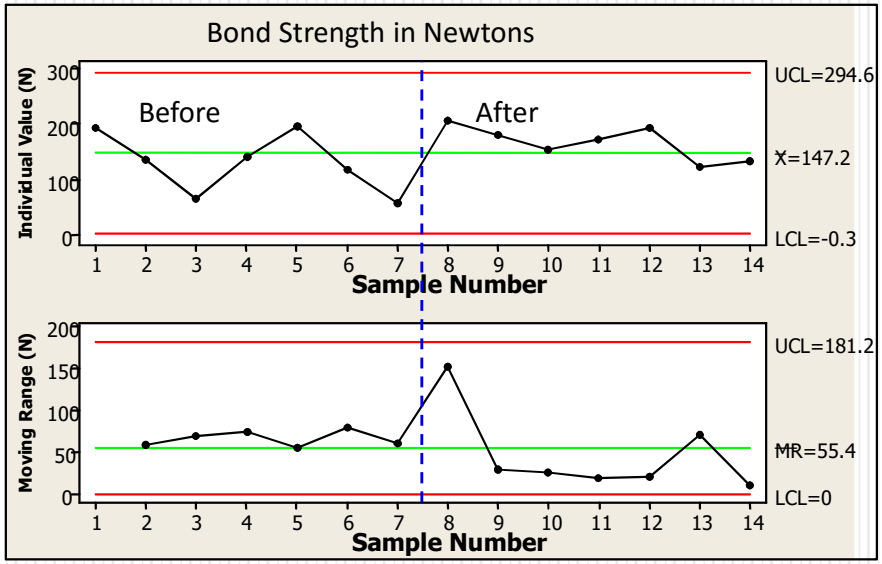
Headliner fabric adhesion before and after an improvement project (Larger values are better).



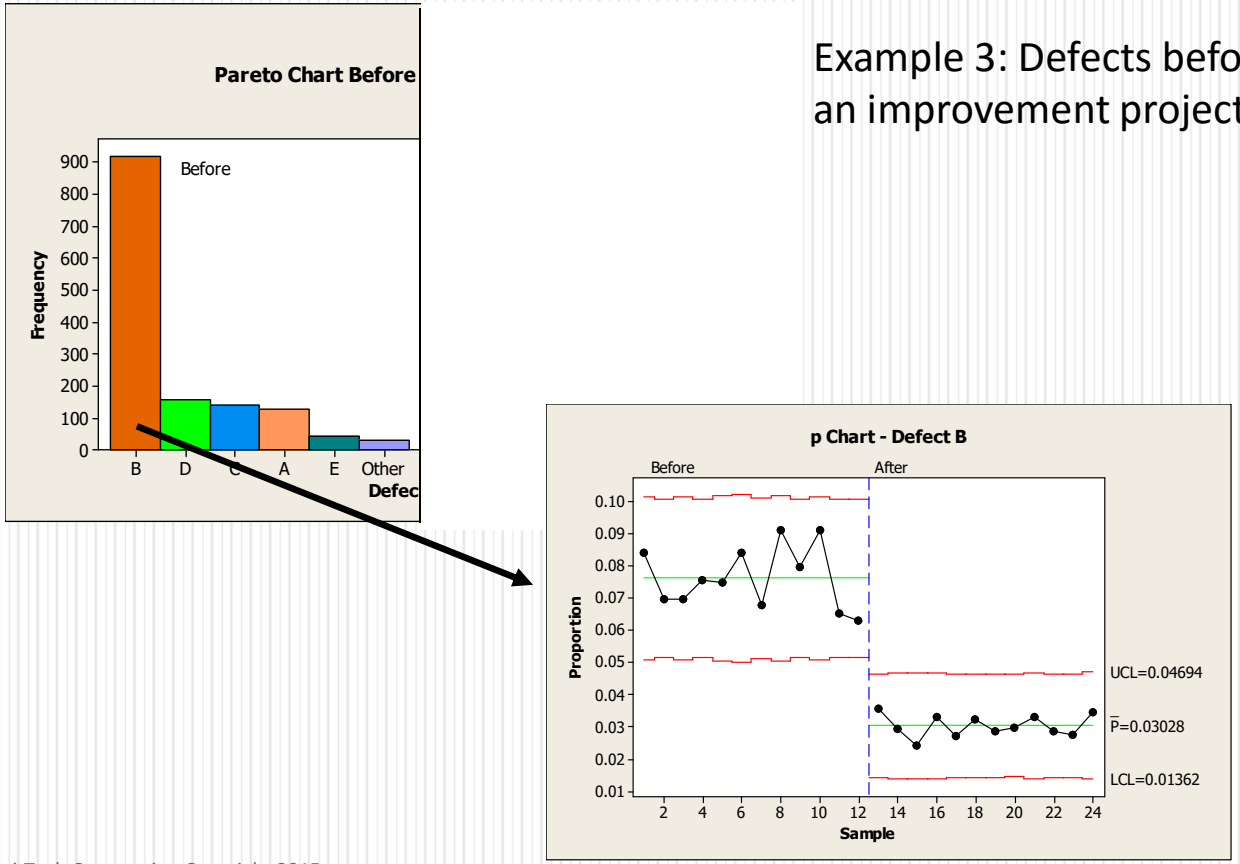
Same data!

Example 7:

Bond Strength before and after an improvement project.



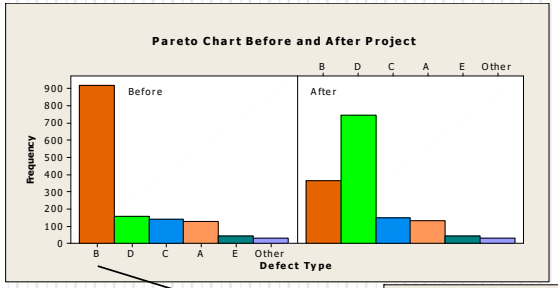
Did the Process Improve? Example 3

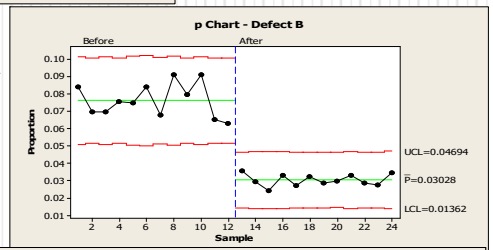


Example 3: Defects before and after an improvement project

Did the Process Improve? Example 3 and 8

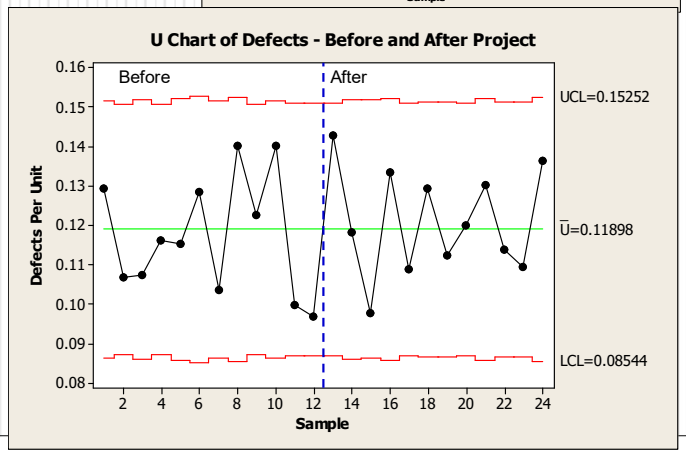
Example 3:
Defects before and after an improvement project





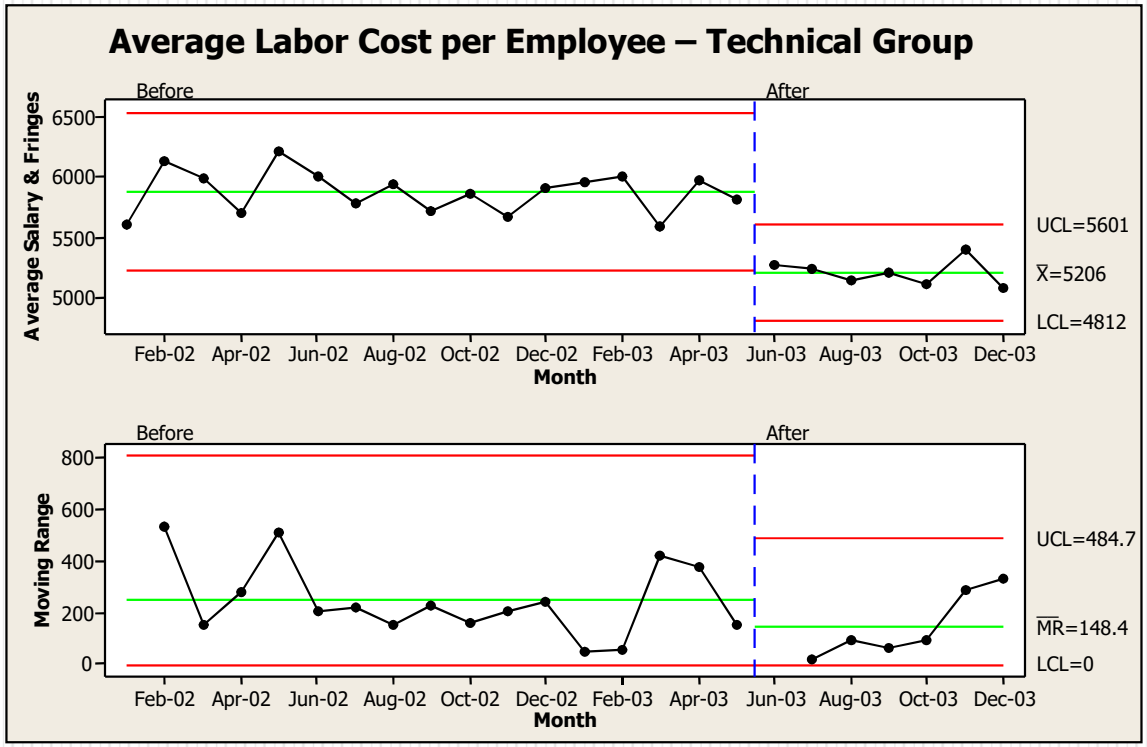
Same data!

Example 8: Defects per Unit before and after an improvement project



Did the Process Improve? Example 4

Example 4: Labor Cost before and after an improvement project



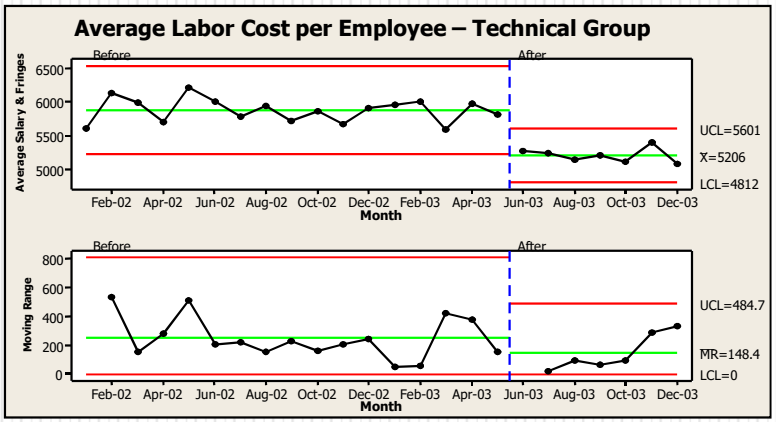
Did the Process Improve? Example 4 and 9

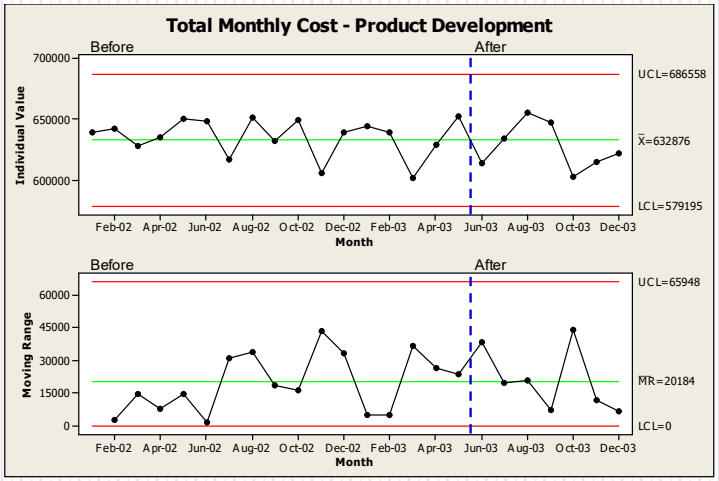
Example 4: Labor Cost before and after an improvement project

Same Process!

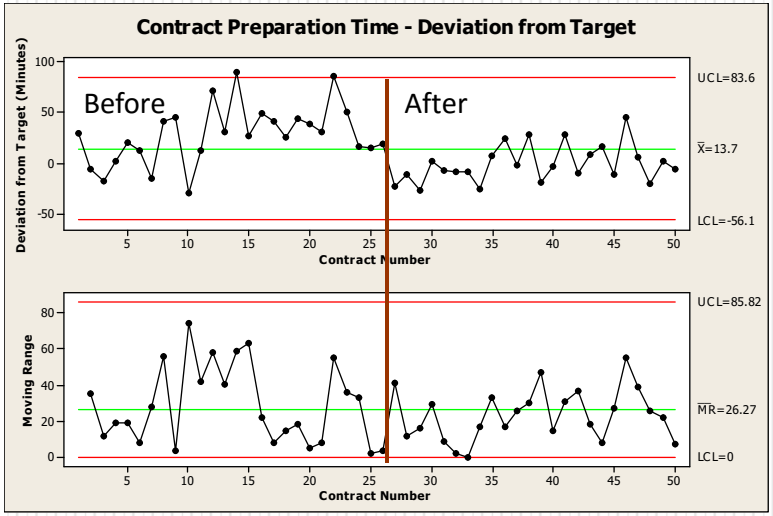
(Data set #4 is subset of data set #9).

Example 9: Total Cost before and after an improvement project





Did the Process Improve?
Example 5: Contract Preparation Time – Deviation from Target



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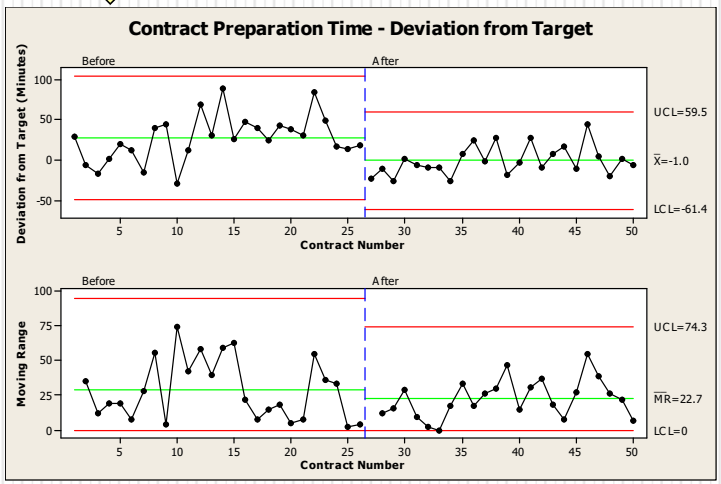

Did the Process Improve?
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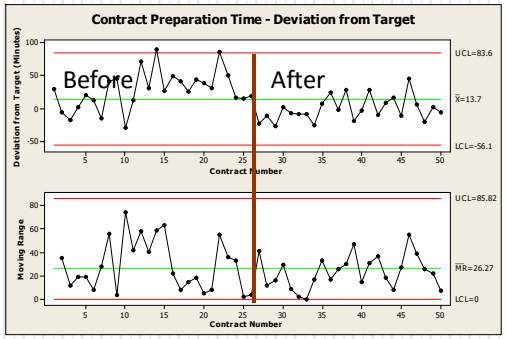
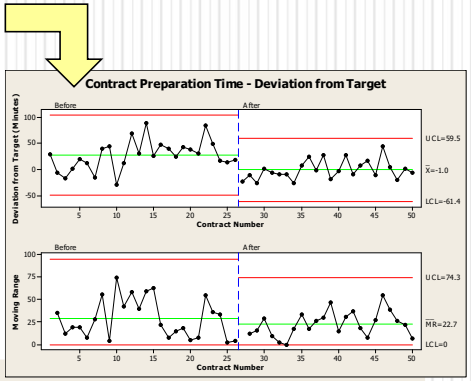
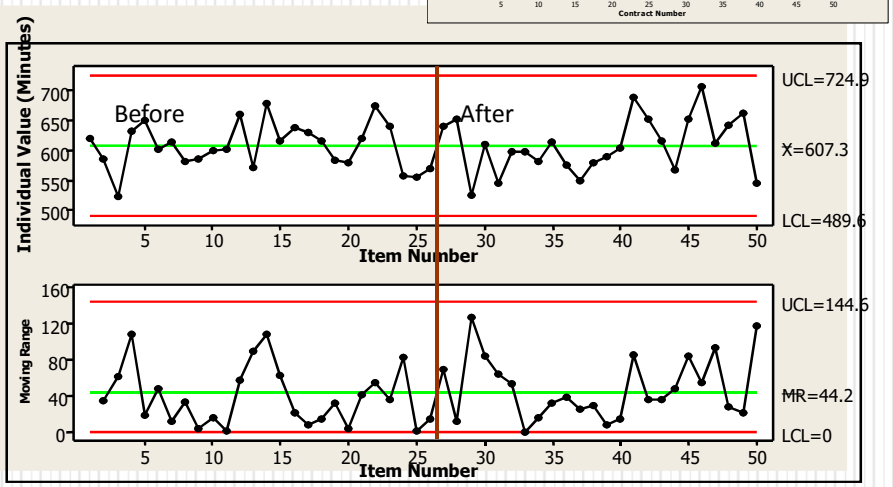




Same data!

Example 10: Cycle Time



Summary of Key Points

1. Binomial data needs to be reported and charted with sample size.
   - Example: Number of rejects out of number shipped
2. Items cannot be compared to each other by merely looking at bar graphs of averages (bar graph = bad; control chart = good).
3. To measure process improvement, look at impact on the process in total (total number of defects, total cost, etc.).
   - Some process changes merely move defect type or cost into another form.
4. Measure and chart the “actual thing”!
   - To measure process improvement,
     - Avoid ratios and other computed values such as “average cost per employee”. What matters is impact on total actual cost.
     - Avoid charting deviation from nominal, forecast, budget, etc.

Did the Process Improve?

The only thing worse than no data is misleading data.