Capability Analysis

1. **When to change a median?**

We generally use 9 consecutive points i.e. the 6 for the signal and then 3 to see if it is sustained but Matt says there are 3 qualitative questions to ask/answer

- Have you made a change/has the process changed? (that may have led to the data signal)
- Are you going to continue with the change?
  - What are your next steps?

2. **Why do we use a median and not a mean for runcharts?**

Use both and see if there is a big difference. You can use both but median is a better measure of the middle, the mean can be skewed by outliers and not truly represent the population e.g. average salary in Scotland.

3. **Capability Analysis**

- Make the numbers sensitive, e.g. time in minutes
- We want the data to be stable and predictable, normal variation; there should not be special cause variation in the baseline.

Instructions for setting up and SPC chart in excel

a) Column A – number sequence, change format to 'text'
b) Column b – data to measure
c) Column C (mean, average) – '=average(B2:B92)', press F4 x2 before each cell to lock and drag down
d) Highlight Column A,B & C, insert line chart
e) Column D – Upper Control Limit – 3 sigma above average (standard deviation, 99.73% variation), Average + 3*(AMR ÷ 1.128) '=C2 + C3* (G2/1.128))', press F4 before G2. Standard deviation needs a normal distribution therefore use 3 sigma
f) Column E – Lower Control Limit- not required for capability and DCAQ
g) Column F – Moving range – '=ABS(B2-B3)
h) Column G – Average Moving Range, average distance between each data point – '=Average (F2:F92)' Always 1 shorter than the last data point at the bottom. AMR is the average of the differences, the average variation between data points.
i) Create chart and put in target line.
j) Capability the UCL should be in below the target
k) Place on quadrant 1st quadrant- will never achieve, 2nd quadrant, not capable, 3rd quadrant 75% capable, 4th quadrant may be capable.
l) Rules: 1 make the numbers sensitive
   2 Normal variation, no signals
   3 Manipulate the data
   4. Change the target