Deploy OpEx™
Turnkey Operational Excellence

```
[Type of Y] ──discrete──> [Defect or Defective] ──defective──> [Equal Subgroup Size?] ──yes──> [NP Chart]   [P Chart]
                                                                         │
                                                                         no ──────────────────────────────────> [P Chart]
     │                              │
  continuous                      defect ───────────────> [U Chart]
     │
[Mean Deviation From Target] ──> [Weight Heavier Recent Data] ──no──> [CumSum Chart]
                                                             ──yes──> [EWMA Chart]
     │
[Subgroup Size] ──>10──> [Xbar-S Chart]
             ──2 to 10──> [Xbar-R Chart]
             ──1──> [I-MR Chart]
```

Common Control Chart Myths
... Donald Wheeler

Data must be normally distributed:
- *"The normality of the data is neither a prerequisite for, nor a consequence of, a predictable process."*

Control charts work because of the central limit theorem:
- *"The conservative nature of three-sigma limits makes the central limit theorem irrelevant."*
- *"The central limit theorem does not apply to subgroup ranges, therefore, if the central limit theorem were the basis for control charts, then the range chart would not work."*

Western Electric Rules

1. *One point more than three standard deviations from the center line*
2. *Nine points in a row on the same side of the center line*
3. *Six points in a row steadily increasing or steadily decreasing*
4. *Fourteen points in a row alternating up and down*
5. *Two out of three points in a row at least two standard deviations from the center line on the same side of the center line*
6. *Four out of five points in a row at least one standard deviation from the center line on the same side of the center line*
7. *Fifteen points in a row within one standard deviation from the center line on either side of the center line*
8. *Eight points in a row beyond one standard deviation from the center line on either side of the center line*