Control Charts Roadmap

Type of Y

— discrete → **Defect or Defective**

— continuous ↓

Defect or Defective — defective → **Equal Subgroup Size?**

Defect or Defective — defect → **U Chart**

Equal Subgroup Size? — yes → **NP Chart**

Equal Subgroup Size? — no → **P Chart**

Mean Deviation From Target → **Weight Heavier Recent Data**

Weight Heavier Recent Data — no → **CumSum Chart**

Weight Heavier Recent Data — yes → **EWMA Chart**

Subgroup Size — >10 → **Xbar-S Chart**

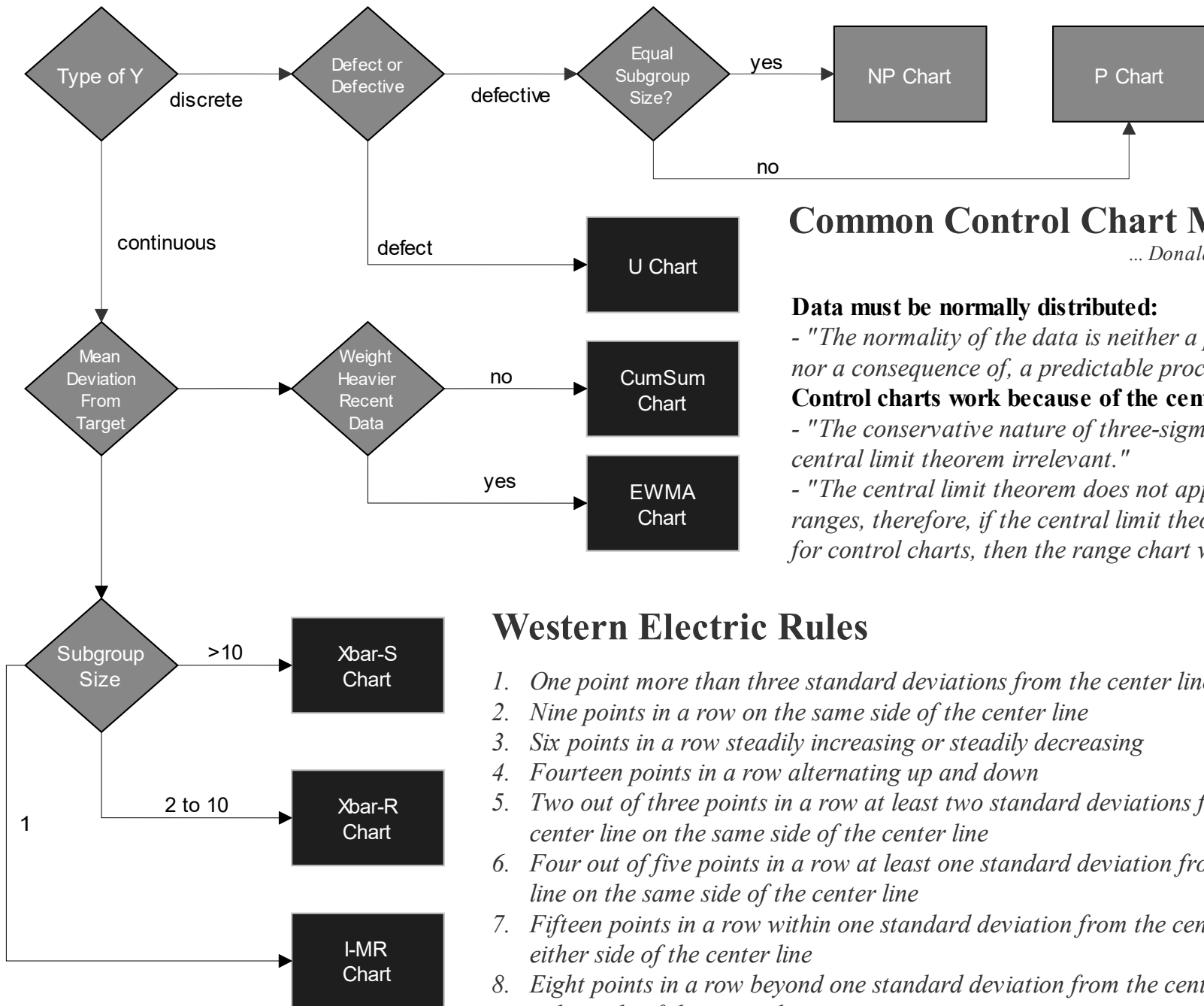**Subgroup Size** — 2 to 10 → **Xbar-R Chart**

Subgroup Size — 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*