Top Ten Things Everybody Should Know About High Maturity

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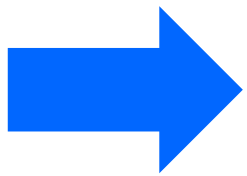
Understanding is Evolving

From

Central themes

- Baselines
- Control Charts
- Statistical management of subprocesses



To

Central themes

- Process Performance Models
- Understanding and use of variation

Supporting themes

- Baselines
- Control Charts
- Statistical management of subprocesses

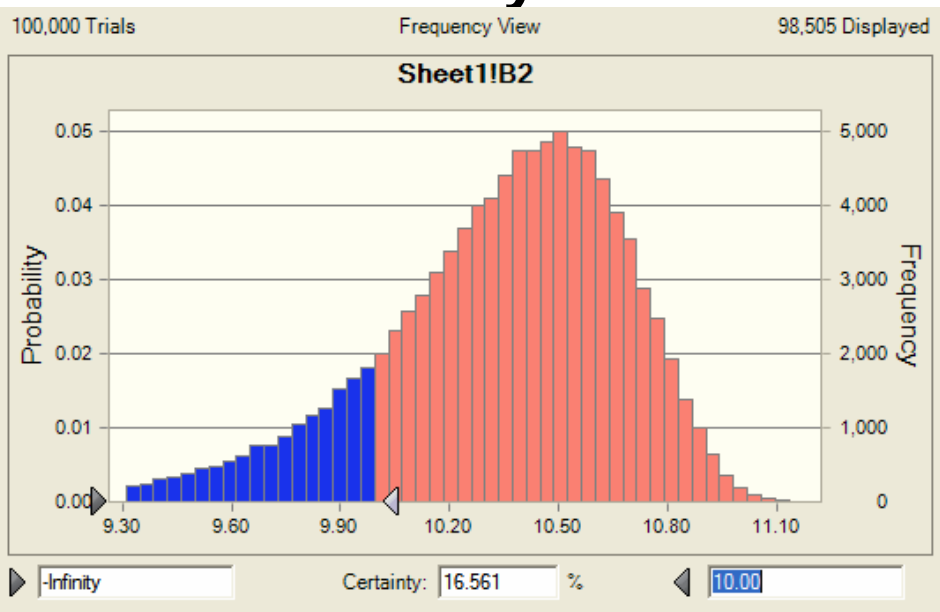
Making Informed Decisions

- Based on quantitative knowledge of
  - Risk
  - Impact
  - Affect on achieving goals
  - ROI
  - Cost
  - Side-effects/ potential suboptimization
- Aided by
  - Understanding variation
  - PPMs

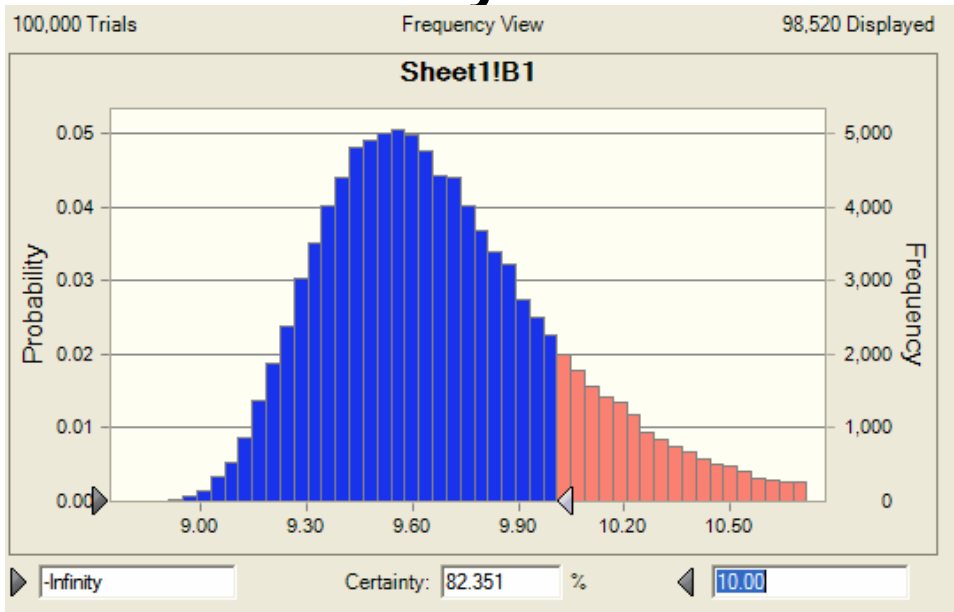
Need to Know More Than Range of Variation

Customer wants the product in 10 weeks
Historical range is 9-11 weeks
Should the job be accepted?

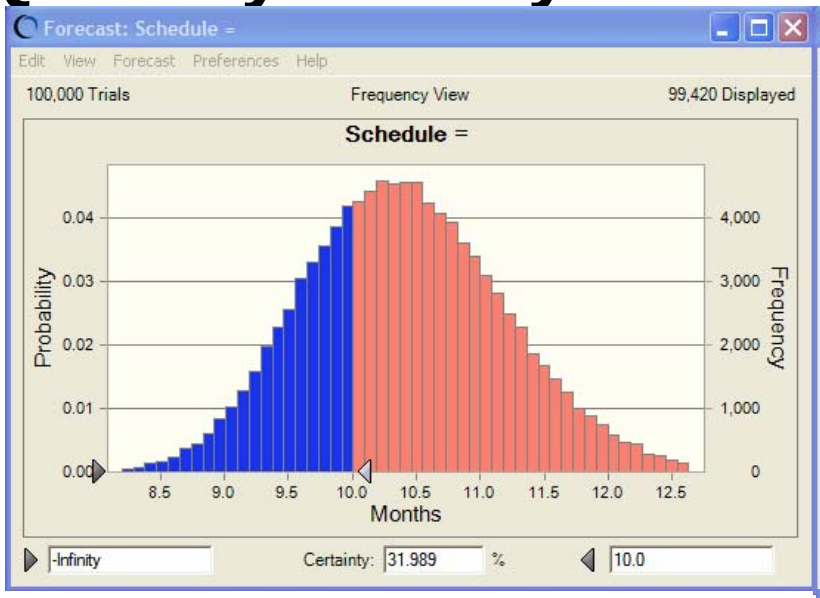
Probably Not

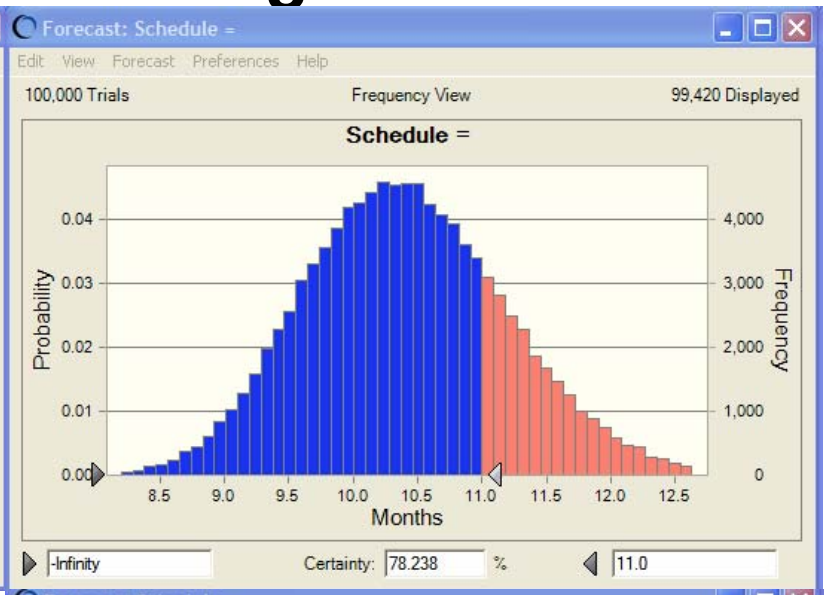


Probably Should



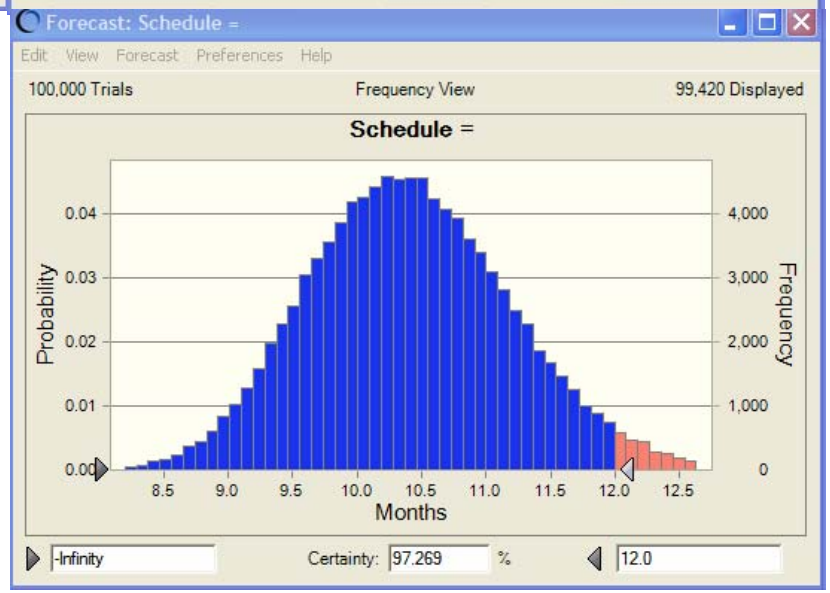
Quantify Risk by Understanding Variation



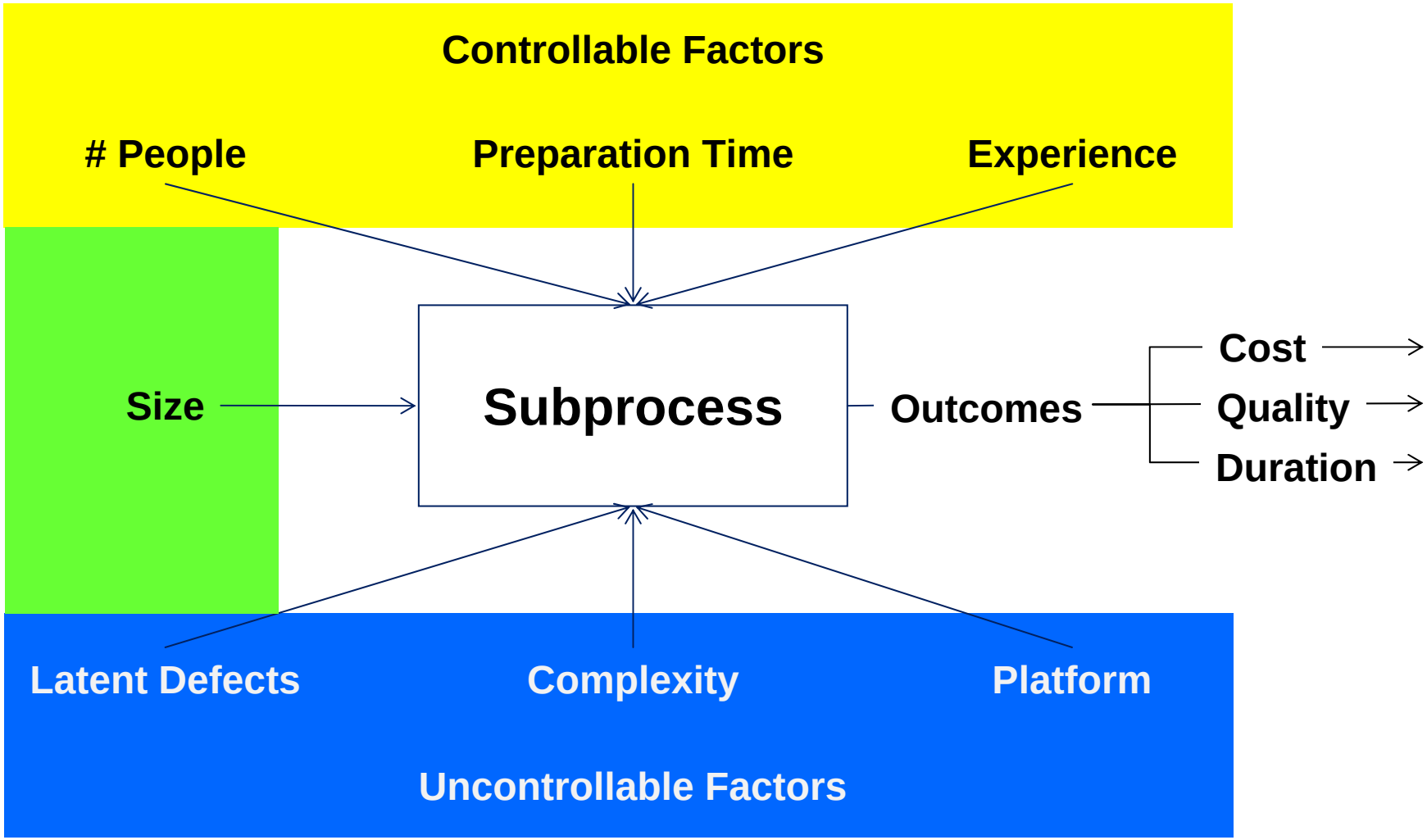


Forecast: Schedule =

Percentile	Forecast values
0%	7.6
10%	9.4
20%	9.7
30%	10.0
40%	10.2
50%	10.4
60%	10.6
70%	10.8
80%	11.1
90%	11.5
100%	14.0



Statistically Managing a Subprocess



Build a Process Performance Model

Predict

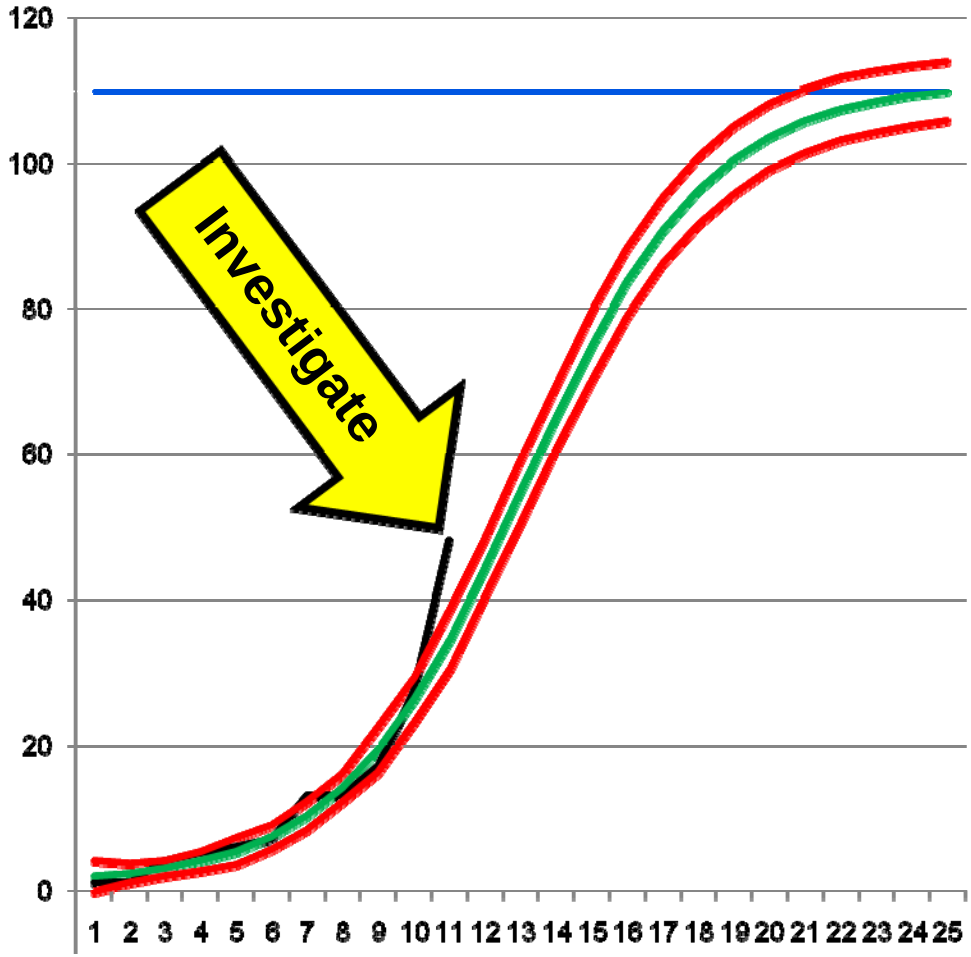
- Achievement of objectives
- Effects of a change
- Outcome of a decision

Avoid suboptimization

- Side effects of a change
- Multi-factor affects of a change
- Interactions of multiple changes

Identify opportunities for improvement

Make informed decisions



$$Y = A + \frac{C}{(1 + T e^{-B(x-M)})^{1/T}}$$

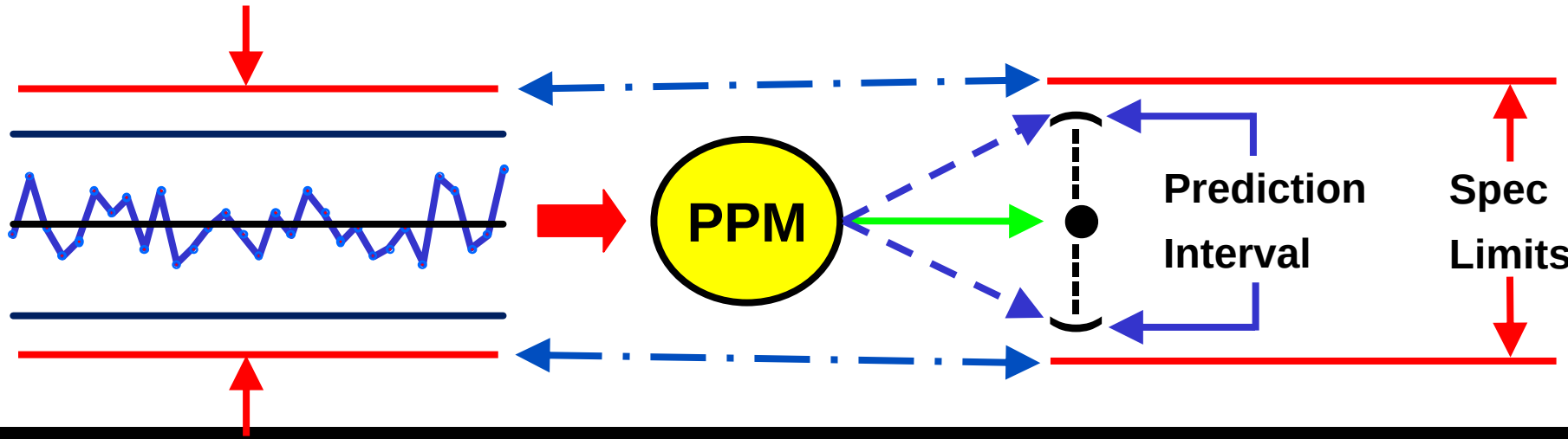
Its not the Data/Chart, it is How it is Used

A wall full of control charts does not make a Level 4

- Who is using them for management
- How are they using them
- How timely is the use
  - Retrospective vs. real-time
  - As the events occur vs. end-of-phase

Using natural bounds

- Natural bounds vs. trial bounds
- Natural bounds vs. specification limits



Don’t Ignore Data from Unstable Processes

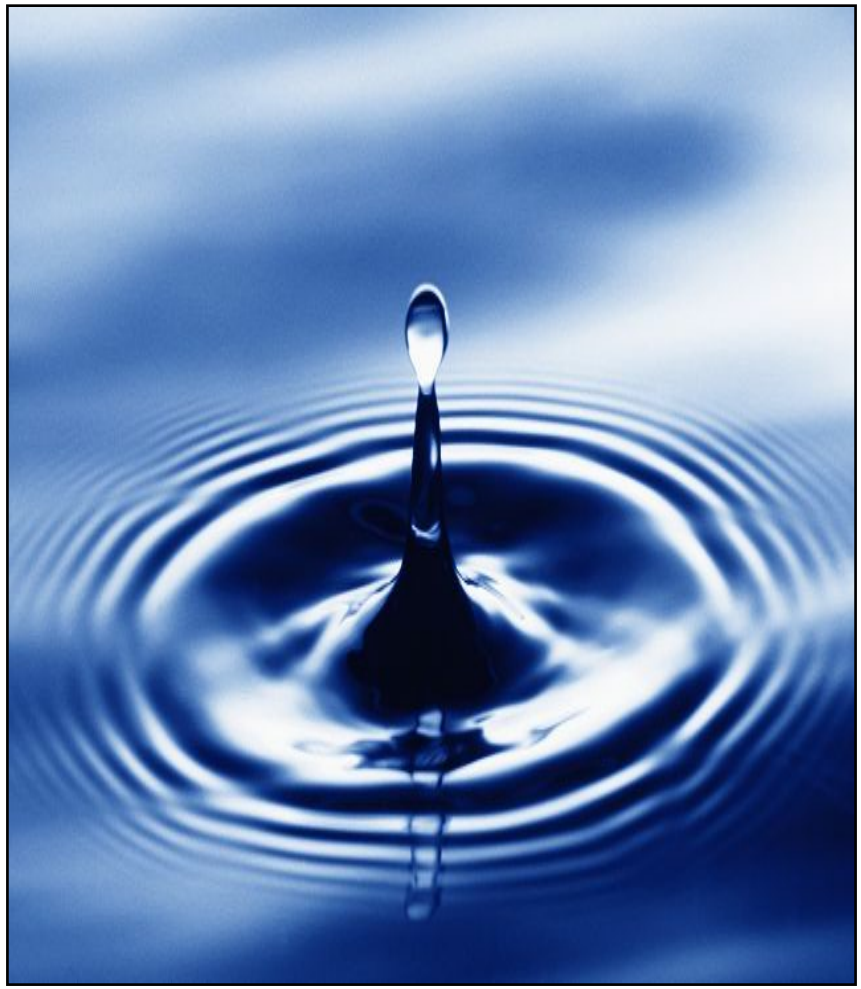
Only a small number of processes will be stable

- Not using data from unstable processes would severely limit the number of and thus usefulness of baselines and models
- Additionally, not all attributes of a “stable process” may be stable

Needs to be clearly documented so the consumer understands the additional risk

Watch out for Suboptimization

- Optimizing for one factor causes another to exceed objectives
- Fixing one problem causes another
- PPMs by modeling the relationships between processes and factors makes suboptimization visible
- Changes ripple through processes, projects, and products



When Data Speaks, HM Organizations Listen

Analyses of the data leads to

- What subprocesses are critical
- What models are needed
- When decisions are necessary
- When decisions are not necessary

Helps answer

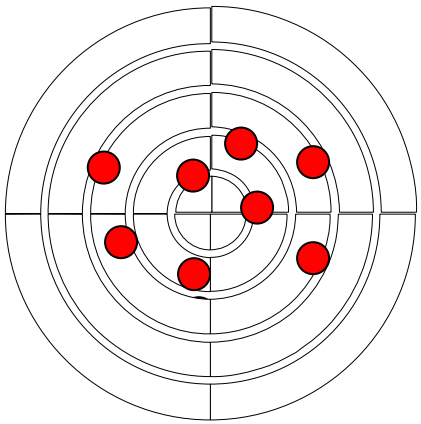
- Was the change significant
- What is the ROI/benefit/impact of this change
- Where are the biggest opportunities for positive change
- Which change will help achieve the objectives

How Much Measurement Error is There?

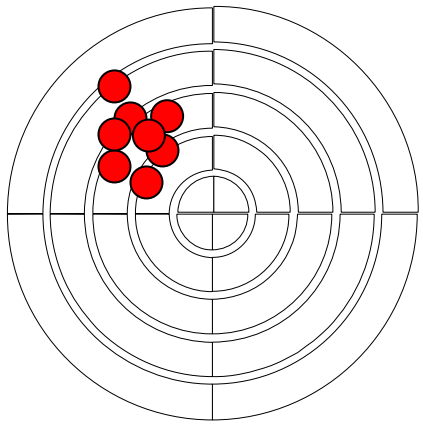
Analyses and decisions will only be as good as the data

Things to consider

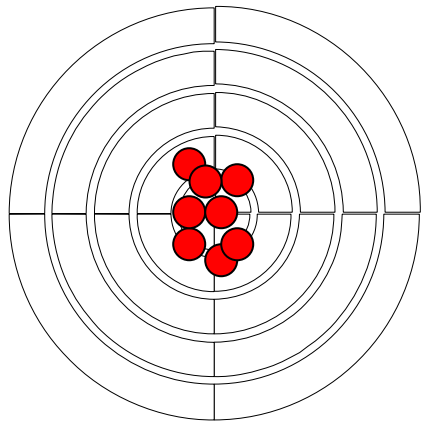
- Determine and understand the Measurement System Error
- Have clear, unambiguous operational definitions
- Train the collectors of the data
- Train the analyzers of the data
- Train the consumers of the analyses



Accurate but not precise



Precise but not accurate



Both accurate and precise

Access to Statistical Help is Critical

Easy and timely access to statistical help is critical

- Mistakes can be costly
- Sometimes they can be subtle mistakes
- Particularly early in the early uses of a new technique

People become frustrated if they have to wait hours or days

- May stop using
- May become passive-aggressive

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