

OCCURRENCE REPORTING SPECIAL INTEREST GROUP  
**Making Business Decisions Using Trend Information**  
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**BUSINESS DECISIONS:** Performance Measures, and the trend information that results from their analyses, can help managers in their decision making process. The business decisions that are to be discussed are:

- Assignment of limited Resources, Funding, Budget
- Contractor Rewards / Incentives
- Where to focus Process Improvement, Reengineering efforts
- When to ask "What Happened? ! !"
- Determine if a previous decision was effectively implemented.

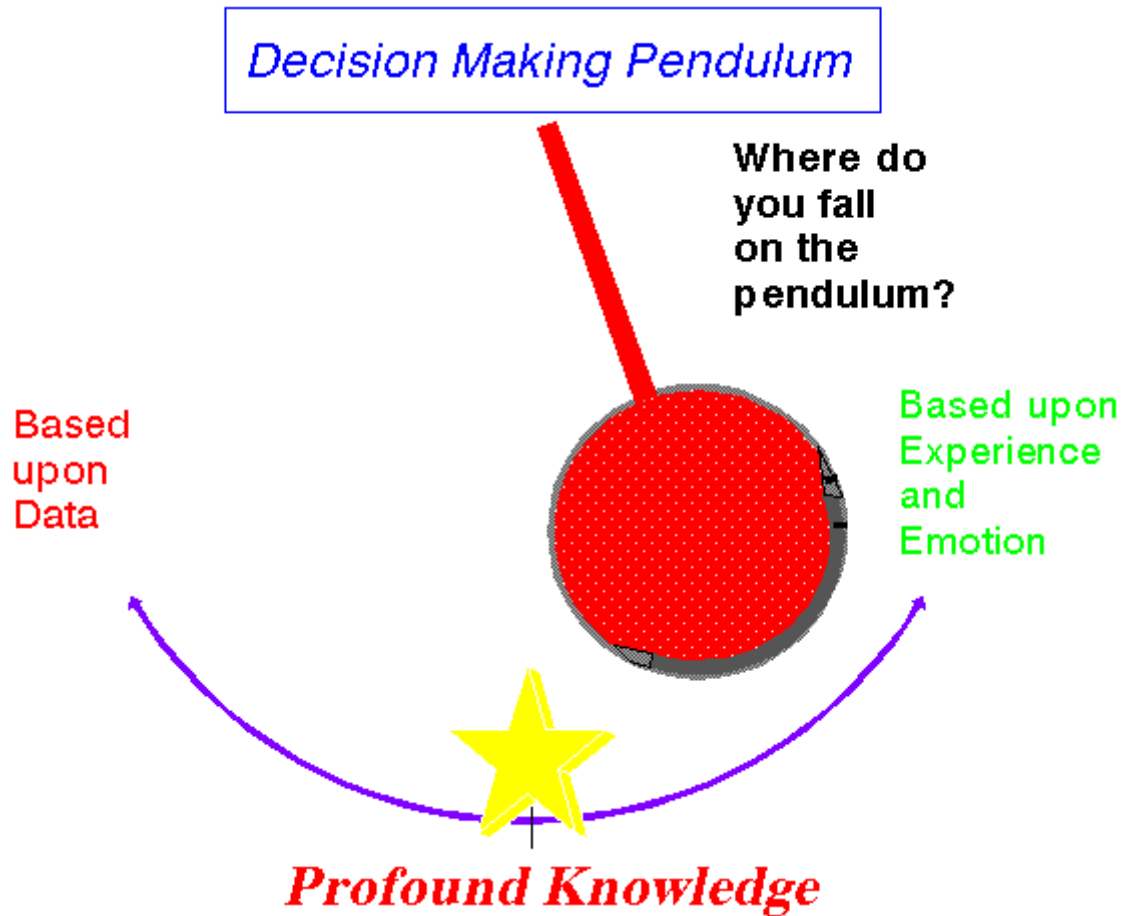
Note that the trend information will not make the decision for the manager. Performance Measure results can prompt the decision maker when to ask for more information (what happened here?), but the performance measure data does not tell the decision maker why the data are the way they are. Proper trending of performance measures can cause the proper questions to be asked. Also, performance measures support the mission and vision of the business, not define the mission and vision. An overall plan as to what are the critical business objectives and priorities is needed prior to use of performance measures.

### **Of Whiz Kids and Seat-of-the-Pants Decision Makers**

There are dangers to over-reliance or under-reliance on data. In the 1960's, Robert McNamara (the Secretary of Defense during the Vietnam War) espoused a scientific approach to decision making. Analysts (who became known as "whiz kids") analyzed data, and made decisions for the generals and admirals in the military. The experience and wisdom of the senior officers was overruled by the "facts" in the data. In his book In Retrospect, Robert McNamara tells the story of why some of these decisions were "wrong, terribly wrong".

On the other hand, there is a danger to relying solely on experience and intuition (this is what worked last time . . .) and ignoring performance measure data. "Gut feeling" and "seat of the pants" decisions can lead to disastrous consequences. An enlightened decision maker will balance the data analysis results with their experience and intuition. Such an enlightened decision maker is moving toward what Dr. Deming referred to as "Profound Knowledge".

### **The Business Decision Pendulum**



Dr. Deming's Theory of Profound Knowledge is documented in [The New Economics](#), and includes

- Appreciation for a system
- Knowledge about variation
- Theory of Knowledge
- Psychology

**How can decision makers use trend information?**

As part of the decision making process:

- Determine Areas where Decisions need to be made
  - Find Problem Areas
  - Find Success Areas
  - Find Stagnant Areas
- Predict the Effects of a Decision
- Evaluate the Effects of a Decision

**Management Philosophies**

There are two opposing philosophies on use of performance measure data.

MANAGEMENT BY OBJECTIVE	TOTAL QUALITY
Set numerical goals, and measure people against these goals in order to determine the success of the people.	Practice Continual Improvement. Demonstrate SIGNIFICANT IMPROVEMENTS in the process data in order to determine success of the process.

### Dr. Deming's Red Bead Experiment.

1. Six "Willing Workers" produce White Beads by dipping a 50 hole paddle into a bucket of red and white beads in four "shifts". They are directed to produce only White Beads. Red Beads are to be avoided, and represent defective product.
2. Various "incentives" (positive and negative) are offered to the workers. Goals and targets are set (such as "Less than 3 Red Beads per paddle"). The "best" workers are praised, the "worst" are laid off.
3. The exercise points out the errors in misinterpreting random variation among workers and from shift to shift, and the fallacy of numerical goals and targets.

Those that have participated in or observed the Red Bead Experiment gain an appreciation for the usefulness of a Total Quality approach versus the traditional Management by Objective approach. Dr. Deming's points 10 and 11 (of his 14 Points) include:

*10. Eliminate slogans, exhortations, and targets for the work force asking for zero defects and new levels of productivity. Such exhortations only create adversarial relationships, as the bulk of the causes of low quality and low productivity belong to the system and thus lie beyond the power of the work force.*

*11a. Eliminate work standards (quotas) on the factory floor. Substitute leadership.*

*b. Eliminate management by objective. Eliminate management by numbers, numerical goals. Substitute leadership.*

### The Theory of Variation

Much of Dr. Deming's work was based upon the Theory of Variation. Another term for "variation" is fluctuation. We have all seen variation (fluctuations) in data at our places of work. The Key for Managing a Process is separating

- **Significant Change** (Trend) from
- **Random Fluctuation** (No trend).

### Definition of a Trend

The word "trend" is a very misused word. Newspapers include headlines referring to the latest "trend", in reference to the latest fad. For purposes of business decision making,

a Trend is a statistically significant change in performance measure data which is unlikely to be due to random variation in the process.

<b>TREND:</b>	<b>NO TREND:</b>
"Special Cause Variation"	"Common Cause Variation"
Significant changes in the data representing improvement or degradation. There is much to be gained from determining the exact source of this variation.	Ongoing, apparently random fluctuations in the process data. Generally, there is little to be gained from determining the exact sources of this random variation. Instead, must look over the long run performance of the process.

### **Process Tampering**

There are situations where the best Business Decision is to take no action. Taking action which is not necessary and actually degrades a process is referred to as Process Tampering. Examples of actions which are actually process tampering include:

- React to and take action on the latest datum point when the performance data has been statistically stable.
- Falsify data in order to meet a goal (quota).
- Find the person closest to the problem and blame that person.
- Assume every incident is a "special case", requiring special actions (add more procedures, training).

The typical process tamperer is the manager searching for a special cause, a quick fix to take, when what is actually needed is a fundamental change to the process(es) involved. If there are no trends, there will not be any special causes to find. The search must be for common causes.

Dr. Deming illustrated process tampering using the "funnel experiment" (The New Economics, Chapter 9).

### **The Control Chart: a tool to detect trends**

Statistical Process Control, which makes use of Control Charts:

- Provides a Black and White, technically defensible way to determine if a "trend" exists.
- Minimizes "false alarms" while preserving the capability to detect a trend

A control chart contains the data for each time period, an average, and three standard deviation control limits. See Guidelines for Statistical Process Control for more details on constructing and analyzing control charts.

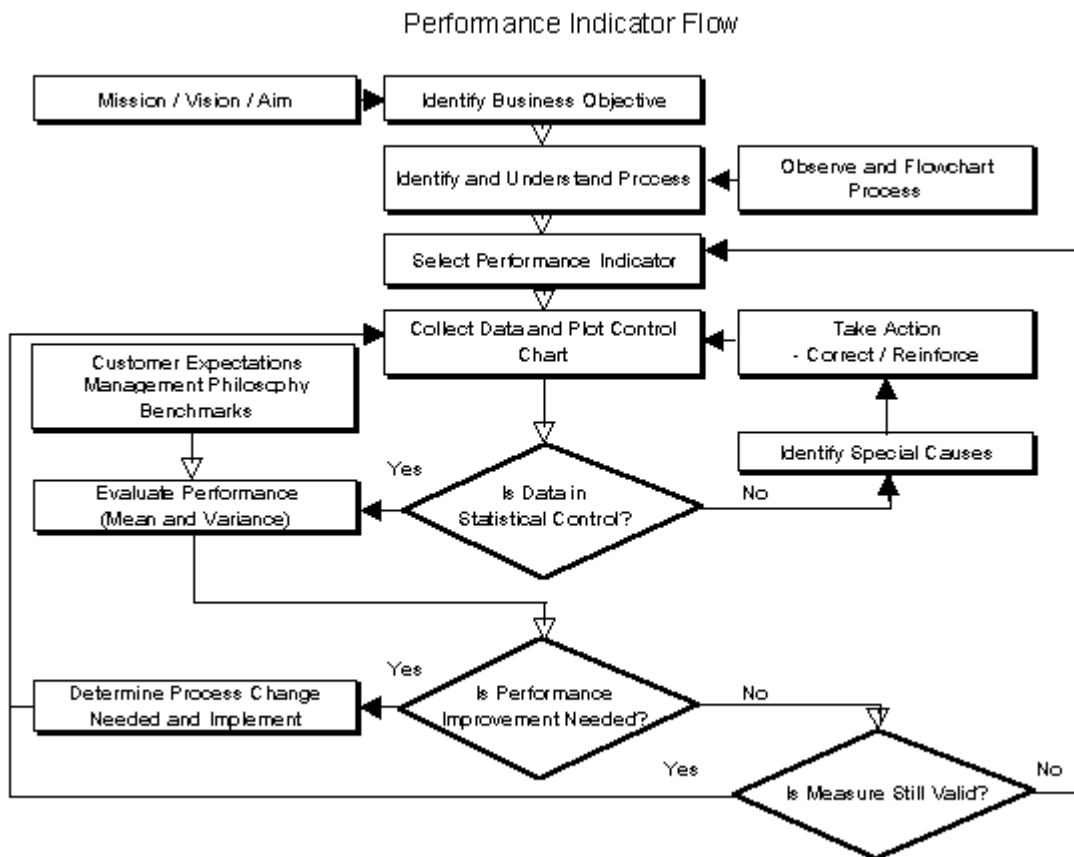
See Example Control Charts for actual control charts and discussion of their interpretation.

### Implementing Performance Measures

Choosing what business performance measures to use can be difficult. Some organizations find the process overwhelming, and in their desire to formulate the "perfect" performance measure, they never embark on collecting any data. Performance measures tend to be evolutionary rather than revolutionary. No one starts with the "perfect" set of measures; successful organizations evolve into their set of measures.

For an overview of a methodology to choose performance measures, see Implementing Performance Measures. Note that involvement and commitment is needed from the line managers and the workers who "own" the processes involved. The owner of the process needs to have ownership of the choice of measures and in their analyses.

Once a candidate set of performance measures has been chosen, the flowchart below provides the methodology for use of the performance measure information.



### . GOALS, OBJECTIVES, CONTRACTOR REWARDS and INCENTIVES

The goal or objective of an organization using this business decision methodology becomes to either

1. Achieve significant improvement or
2. Maintain current performance, with no degradations.

This standard can be used as part of contractual rewards and incentives. One would specify the measure(s), and rewards specified for significant improvement, or for maintenance of current performance. Penalties for significant degradation could also be called for.

### **CONCLUSION**

- Trending can provide an input for rational Business Decisions
- Key Element is determination of whether or not a significant trend exists -- Segregating Common Cause from Special Cause
- The Control Chart is the tool for accomplishment of trending and determining if you are meeting your Business Objectives.
- Eliminate Numerical Targets; the goal is Significant Improvement.
- Profound Knowledge requires integrating data results with gut feeling.

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