THE IMPORTANCE OF MEASUREMENT

Presenters:

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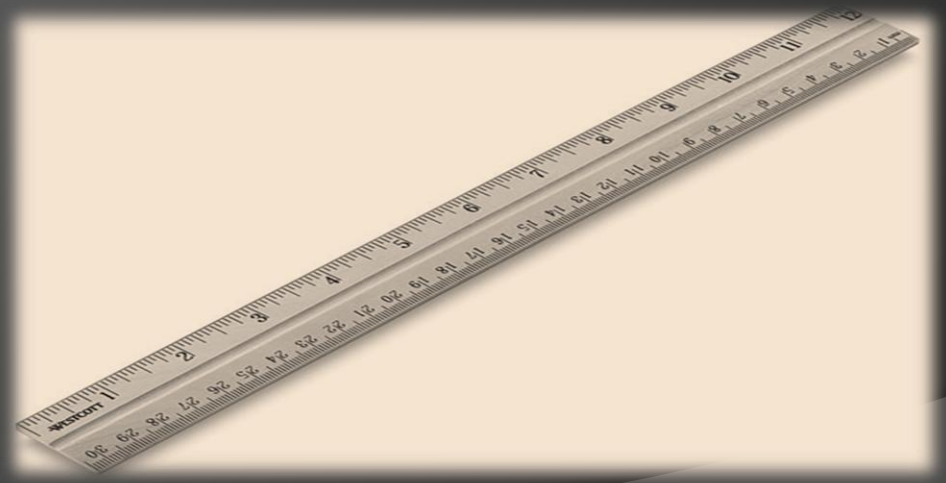

Definition

- Measurement gives a numerical value to describe the magnitude of a quantity of a given parameter.
- “Measurement is the first step that leads to control and eventually to improvement. If you can’t measure something, you can’t understand it. If you can’t understand it, you can’t control it. If you can’t control it, you can’t improve it.” — H. James Harrington

Why Measure?

- Measurement allows for the useful application of data to evaluate past/current/future processes against organizational goals.
- It will identify baselines as well as changes in performance that can be compared to internal and external sources.
- Allows for opportunities for improvement.
- Measurement is part of our everyday lives.

Key Attributes of Measures

- Readily Available
- Accuracy and Timeliness of the input
- Aligned to the strategy of the organization
- Accuracy of output – Quality/use ability of output
- Energizes user onto action – Manage what you measure
- Graphically Displayed – Show in a simple, usable format

Types of Measurement Devices

- *Metric system*
  - International System of Units (SI)
    - Based on the metre, kilogram, second, kelvin, ampere, candela, and mole.
- *Imperial and US customary units*
  - Inch, foot, yard, mile, ounce, pound etc.
- *Natural units*
  - Physical units of measurement defined in terms of universal physical constants in such a manner that some chosen physical constants take on the numerical value of one when expressed in terms of a particular set of natural units.
  - Planck units, Stoney units, Atomic units, Electronic units, etc.
- *Non-standard units*
  - Area (ex. Football Field Length)
  - Energy (kiloton, megaton, and gigaton)
- *Units of Currency (Dollars, Yen, Euro)*

Role of Measurement

- Measurement plays a major role in the fabric of our society.
  - Ensures the safety and effectiveness of healthcare diagnostics and treatments.
  - Used in measuring the amount of gas supplied to our buildings or fuel in our vehicles.
  - Allows the safe operation of vehicles on the ground, water, and air.
  - Enables consistency of international time standards so we can communicate and navigate accurately around the world.
  - Measurement helps ensure the security and sustainability of our food supply.
  - It allows fairness between buyers and sellers in markets where goods are sold by weight or volume.
  - Ensures the safe construction and maintenance of the world's infrastructure.
  - Regulates the worlds economy.

Role of Measurement (cont'd)

- Helps with Innovation
  - Improvements in quality and performance
  - Reductions in waste
  - Use of new materials and/or techniques

Data

- Collection of facts, statistics or any other material that can be used for reference or analysis.
- Sources
  - Primary - first hand sources gathered by the researcher or assistants presently.
  - Secondary - data based on second-hand information. It is usually compiled by other researchers in the past.

Types of Data

- Qualitative
  - Nonnumeric
  - Need to have exact definitions of what it is, what it is recorded in, and the reason the data was collected.
- Quantitative
  - Numeric
  - Discrete data – finite numbers (ex. 1,2,3,4,5,etc)
  - Continuous data – infinite possibilities (ex. 1.414114…)

Tools to Collect Data

- Surveys, Questionnaires, and Checklists
- Interviews
- Documentation Review
- Observation
- Focus Groups
- Case Studies

Method to Collect Data

- Sampling is the selection of a subset of people from a statistical population that will estimate certain characteristics form the whole population.
- The population must possess an acceptable number of samples.
- The population sampled must be very similar to the represented population.

Stages of Sampling

- Defining population of interest
- Specifying a sample frame or other events to measure
- Formulating a sampling method for selecting events from the frame.
- Determine appropriate sample size
- Implement the sampling plan
- Sampling and data collecting
- Select Data

Sampling Bias

- This occurs when a sample is collected in a way that the members in an intended population are less likely to be represented than others.
- Some Examples
  - Undercoverage – Occurs when some part of the population that is sampled is excluded.
  - Voluntary response bias – People who feel most strongly about the subject of concern is more likely to respond.
  - Wording Bias – Happens when the wording of the question influences the response of participants.

Importance For Patients

- One report with the wrong demographic/patient information does not seem important when compared to thousands in a given time period.
- When compared to a narrower range such as a particular provider, the number of reports dwindle down to maybe 20.
- More so, compared to a parent, it is unacceptable.
- “ One mistake is too many”.
- Without measurable parameters, the importance can never be fully realized.

Your Measurement is only as good as your data

QUALITY IS ONLY AS GOOD AS YOUR ANALYSIS, YOUR ANALYSIS IS ONLY AS GOOD AS YOUR MEASUREMENT

Sources

1. http://www.uwex.edu/ces/pdande/resources/pdf/Tipsheet8.pdf

2. http://www.education.com/study-help/article/sampling-bias

Thank You