



# SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35

## DEPARTMENT OF MECHANICAL ENGINEERING



### Need of Measurement

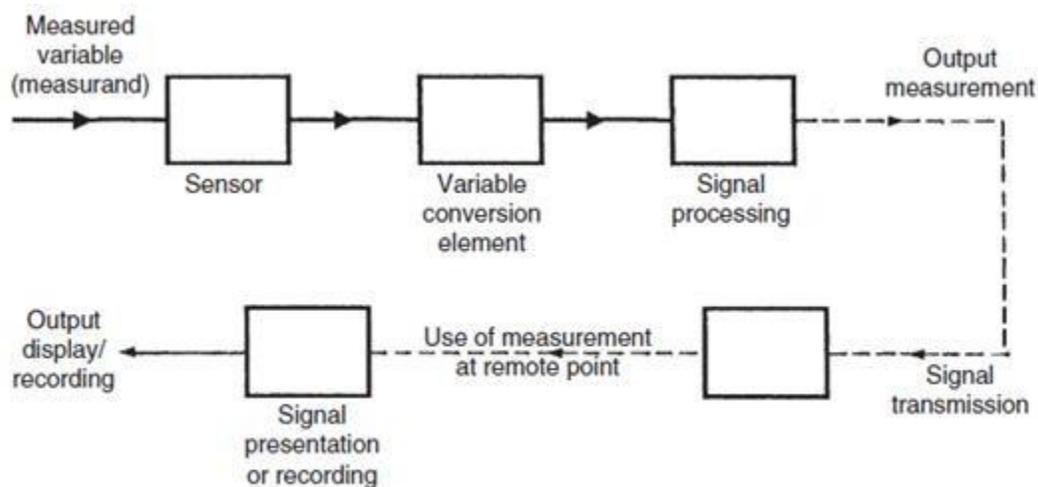
Before all the branches of science were clubbed together under the nomenclature 'Natural philosophy', under which all observations of subjective nature were being carried out and spirit of enquiry was almost non-existent, we were satisfied with simple explanations.

The subjective interpretation including measurement, obviously varies from person to person, since the interpretation is based on one's senses. Gradually, the generations began to ask 'how' things are happening. Thus, the observations became more objective. Thus, physics - one of the many sciences, became a subject of observation and measurement.

When we quantify, what we are observing, then such an observation is a science or knowledge. However, without the quantification of an observation, thought is simply a process of gaining knowledge, but has yet to reach a stage, to be called a 'science'.

Hence, to call a subject 'science', the thought process ultimately has to be quantified suitably, using appropriate units of measurement.

### Elements of measuring system



**Fig 1.1 Generalised Measurement system**

Primary Sensing Element: -

The measurand is first detected by primary sensing element. The primary sensing element transfers the measurand to variable conversion element for further processing. The output signal of a primary sensing element is a physical variable such as displacement or voltage.

Variable Conversion Element: -

The output signal of a primary sensing element may require to be converted to more suitable variables while preserving its information content. This function is performed by variable conversion element and it may be considered as an intermediate transducer

Variable Manipulation Element: -

This element is an intermediate stage of a measuring system. It modifies the direct signal by amplification, filtering, etc; so that a desired output is produced the physical nature of the variable remains unchanged during this stage.

Data Transmission Element: -

When the functional elements of the measuring system are spatially separated then it becomes necessary to transmit signals from one element to another. This function is performed by data transmission element. It is an essential functional element where remote control operation is desired.

Data Presentation Element: -

Usually information about the quantity being measured is to be communicated to human observer for monitoring control and analysis purpose. This is therefore, to be presented in form of human sensory capability. This function is done by data presentation element.