Lecture 1

Definition: Measure

Ascertain extent or quantity of [thing] by comparison with fixed unit or with object of known size

Definition: Evaluate

Assess the quality of something, preferably by assigning a numerical value to it

1 Forms of measure

Definition: Quantitative

Concerned with things that are countable, and independent of the observer

Definition: Qualitative

More concerned with having the observer make judgements - and typically use ordinal scales

Definition: Indirect measurements

Things we can measure are combined to provide a ”surrogate” measure for some attribute we can’t measure directly

2 Variation

In the physical sciences, repeated measurements will usually result in a **Normal** distribution, with a bell shaped curve that is centred on the mean

Where an experiment involves humans, the spread of values is more complex and may well be asymmetric. We usually show this by using the median as our centre point, as illustrated by box plots

3 Software Metrics

Measurement science tends to differentiate between an attribute, which we associate with some element, and a metric, which will be some specific number and associated unit of measurement

When adopting a metric, we need a clear definition of the counting rules used to measure its value

4 Roles for metrics

Definition: Actionable Metrics

Relate to things that we can control. We can then react to the values we measure for the metric by making changes

Definition: Informational (or unactionable) metrics

Relate to things we can measure and they may matter to us, but we can't directly influence

5 Why are metrics important

- For any software project, metrics an provide the means of control, to monitor how well our estimated values for such attributes as size, quality, dependencies etc. match the actual values that we measure
- In turn, making estimates also requires that we use such measures, because ultimately we need to determine how much effort a project needs and what levels of skill, and when it might be delivered

6 Complexity

- Complexity is not an attribute in itself so must have a clear context of what attributes, or set of attributes we are referring to
- Complexity is a property of attributes such as control flow, information flow, coupling etc
- Therefore need some idea of what threshold value will be used to determine that something is considered as being complex.