Week-04-L-01

Select a Statistical Model

Planning and designing of experiments

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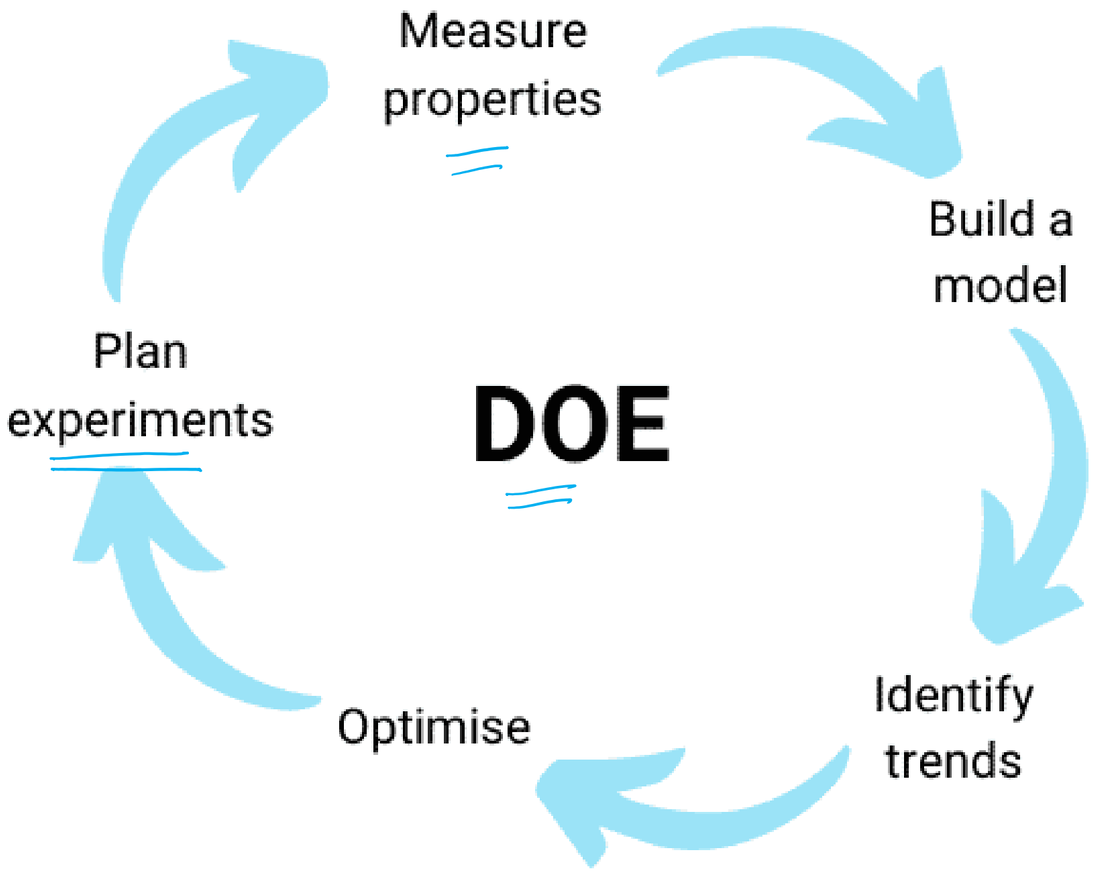
Planning of Experiments

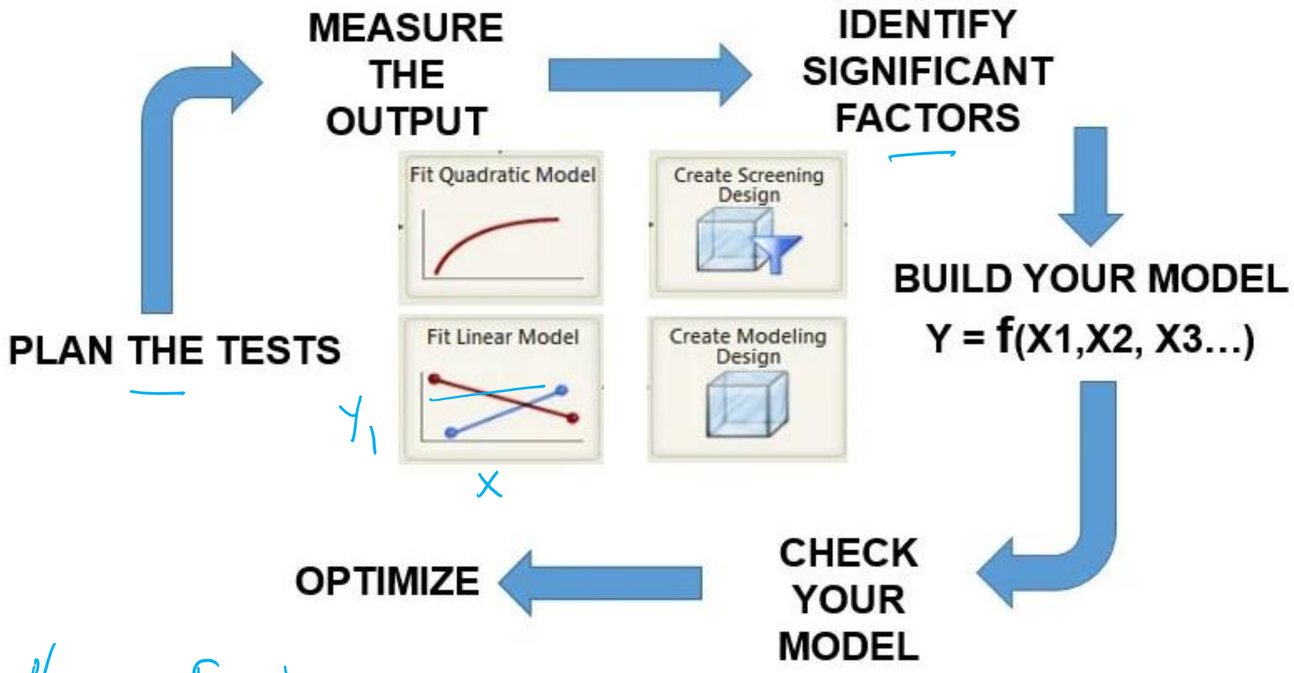
- Planning and designing of experiments
- Size and Shape of Design
- Probability & Distributions
- Interpretation using regression analysis
- Types of Models & Uses
- Select the right model



Source: www.intellegens.com

Design of Experiment (DoE)

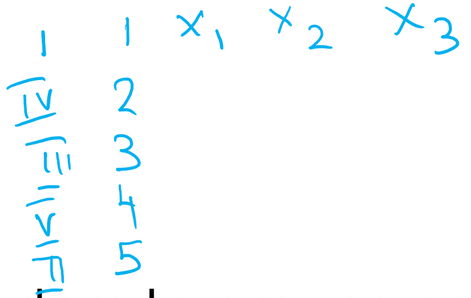
- It is a plan of layout of an experiment
- The treatments are allocated for the plots based on the theory of probability.
- Follow certain set of rules and procedure to obtain appropriate observations.



Source: blog.minitab.com

100% → Fert
100% → water
100% → moisture
= Productivity

Terms Associated



Randomization:

- The process of assigning individuals at random to groups or to different groups in an experiment, so that each individual of the population has the same chance of becoming a participant in the study.

Statistical replication:

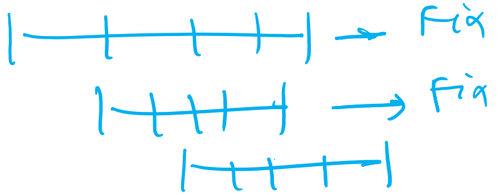
- Repetition and replication of full experiments to help identify the sources of variation.

Blocking:

- Non-random arrangement of experimental units into groups (blocks) consisting of units that are similar to one another.

Orthogonality:

- It concerns the forms of comparison (contrasts) that can be legitimately and efficiently carried out.



Factorial experiments:

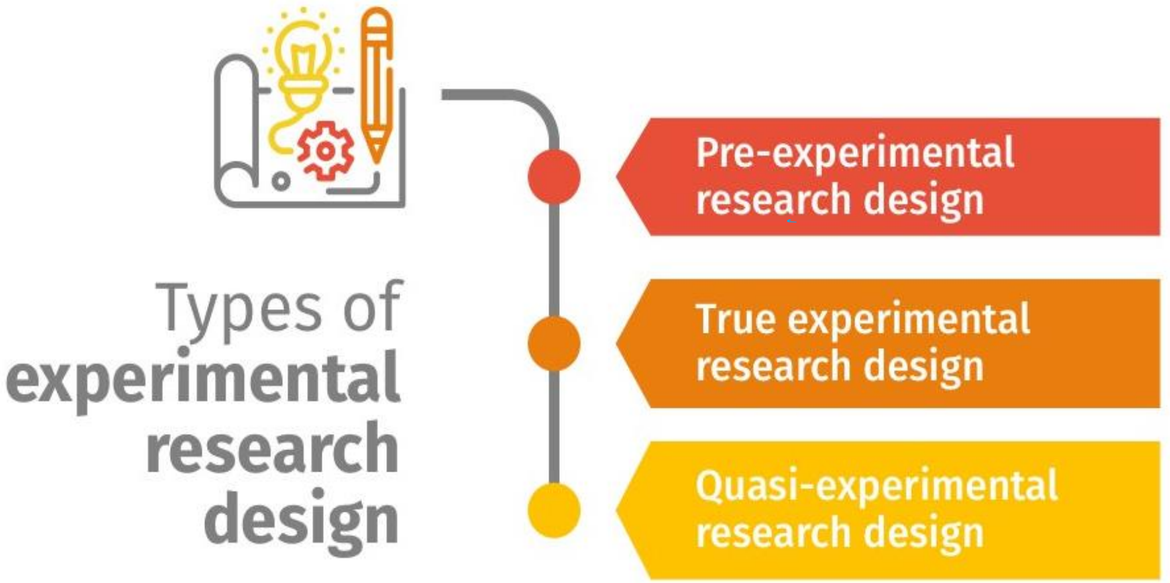
- Use of factorial experiments instead of the one-factor-at-a-time method.

Types of DoE

1. **Pre-experimental research design:** A group, or various groups, are kept under observation after implementing factors of cause and effect.

2. **True experimental research design:** True experimental research relies on statistical analysis to prove or disprove a hypothesis, making it the most accurate form of research.

3. **Quasi-experimental research design:** The word ‘Quasi’ indicates similarity. A quasi-experimental design is similar to experimental, but it is not the same.



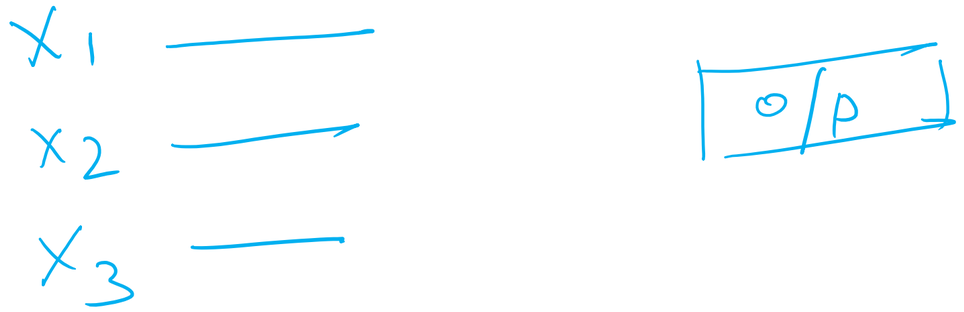
Source:
www.queestionpro.com

Benefits

1. **Effect estimates precision (primarily):**
   One can calculate an average from the tests that have been performed (an average for the low setting of a factor and an average for the high setting).

2. **Factor interactions:**
   The effect of factor A, for example, may be much larger when factor B is set at a specific level, leading to an interaction.

3. **Balance within the design (or design orthogonality):**
Each level of each factor is associated as many times with 'each level of each one of the other factors', leading to a design with balanced combinations of levels.



Thank you