



Experiment Operation

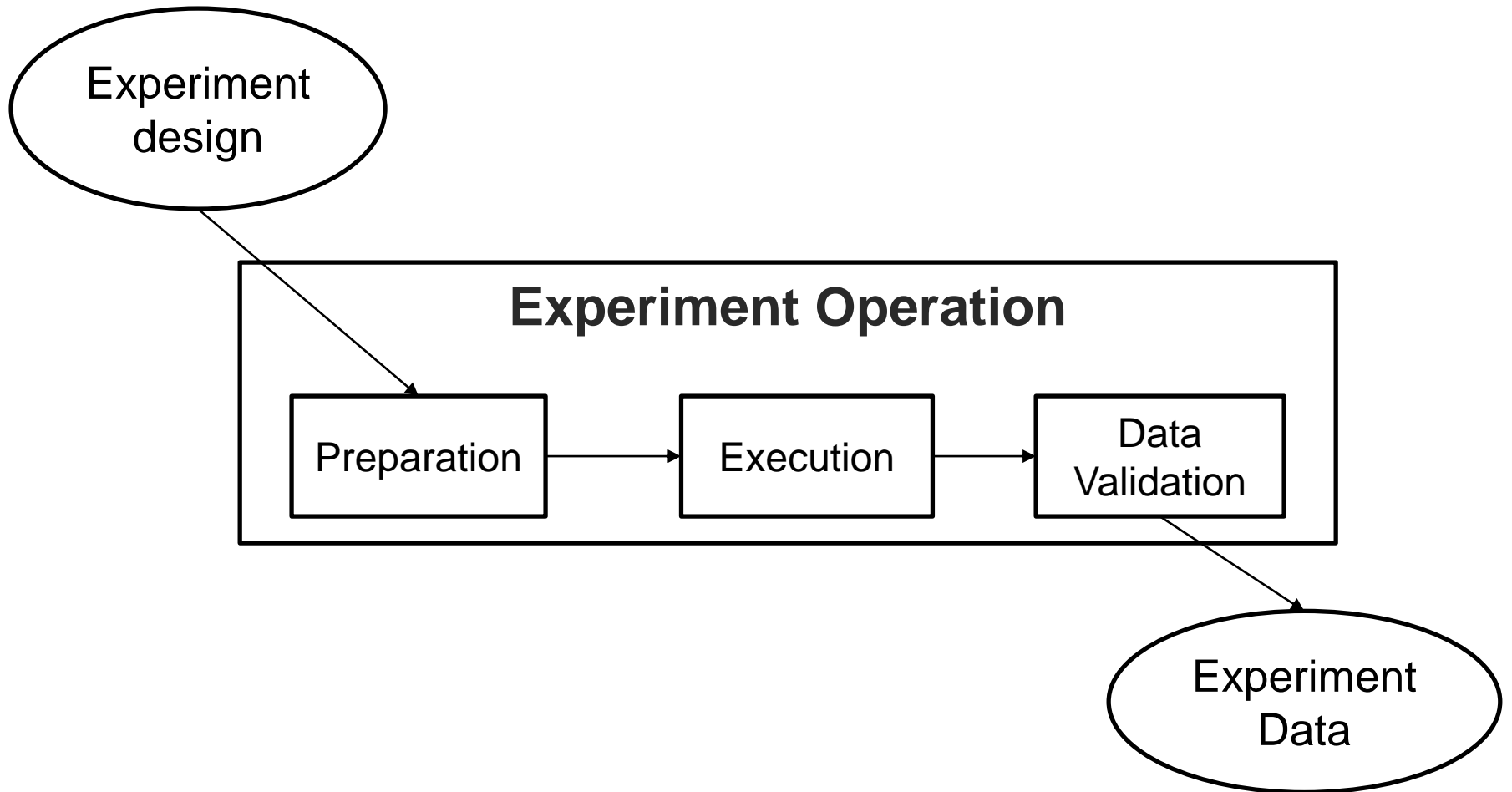
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[Operation]

- In the operation phase of an experiment, the treatments are applied to subjects
 - In this part, the experimenter actually meets the subjects
- Even if the experiment was perfectly planned, the results will be invalid if subjects do not take it seriously

[Operation Phase Overview]



[1st Step: Preparation]

- There are two important aspects of preparation
 - Commit participants: it is essential that subjects are motivated and willing to participate
 - Instrumentation: this include the experiment objects, guidelines, and measurements

[Commit Participants]

- It may be important to select people who work with tasks similar to the experiment
 - Otherwise, training may be required
- Ethical aspects have to be considered
 - Obtain consent: participants have to agree.
 - Sensitive results: sensitive data (e.g., productivity) must be confidential.
 - Inducements: price should not be too valuable. Participate only for the price.

Instrumentation Concerns

- If subjects collect data, clear forms must be provided
 - When it is possible, anonymous forms should be used
- If data is collected in interviews, questions should be prepared before the experiment
 - Sometime, questions can be adapted depending on previous answers

[Data Collection]

	Forms	Interviews
Advantages	They require less effort from the experimenter	It is possible to explain better the questions and identify flaws during data collection
Drawbacks	Inconsistencies are only revealed after the data collection	They require more effort from the experimenter

[2nd Step: Execution]

- Some experiments can be carried out in only one occasion (simpler)
 - Example: our experiments in class
- Others are executed during a longer time span (more complex)
 - Experimenter cannot participate in every detail of the experiment and data collection

3rd Step: Data Validation

- When data has been collected, the experimenter must check if they are reasonable and are correctly collected
 - For instance, subjects have to understand the forms and fill them out correctly
- Experimenter may check for misunderstanding
 - For instance, give seminar to present and discuss the results with the subjects

[Summary of Operation]

■ Preparation

- Select participants and get consent
- Randomly split participants (block)
- Prepare infrastructure and forms

■ Execution

- Run the experiment with all subjects

■ Data Validation

- Check if everyone answered the questions

[Bibliography]

- C. Wohlin et al. **Experimentation in Software Engineering**, Springer. 2012.
 - Chapter 9 – Operation