



# Overview of Case Studies

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# [ Informal use of “Case Study” ]

- The term case study frequently appears in title and abstracts of papers
  - Its meaning varies a lot from large studies to small toy examples
- Case study is also called “field study” or “observational method”

# [ What “Case Study” means? ]

- A case study is defined as an empirical method aimed at investigating a object (or phenomena) in its real context
  - It relies on multiple sources of evidence
- Unlike experiments, case studies do not aim for generalization
  - It is often criticized for being of less value

# [Case Study vs. Action Research]

- Action research is closely related to case study
- Main differences
  - Case study is purely observational
  - Action research is focused on the process change (e.g., software process improvement)

# [ Case Study in SE ]

- Software engineering is a multi-disciplinary area and involves
  - Psychology, sociology, business, etc.
  - Case studies are common in these disciplines
- Case studies are suitable for many kinds of Software Engineering research

# [ Key Characteristics ]

- It is flexible to cope with complex or dynamic phenomena of the real world
- Its conclusions are based on multiple sources of evidence
- It adds to existing knowledge about the phenomena under study



# [ Flexibility of Case Studies ]

- A case study does not need strict boundaries between the studied object and its environment
  - Planning a case study is still necessary
- It provides deeper understanding of the phenomena under study in their real context

# [ Sources of Evidence ]

- Different kinds of evidence, figures, statements, and documents are linked together to support the conclusions
  - Results are hard to generalize, but provide deeper understanding of the phenomena
- Case studies do not aim to provide conclusions with statistical significance

# [ Advantages and Drawbacks ]

## ■ Advantages

- Case studies are easier to plan
- Results are more realistic



## ■ Drawbacks

- Data are hard to interpret
- Results are difficult to generalize





# Case Studies and Other Methods

# [ Combining Methods ]

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- A case study may contain elements of other research methods
  - Survey may be conducted within a case study
  - Literature review may precede it
  - Ethnographic methods can be used for data collection in a case study

# [ Ethnographic Studies ]

- The experimenter observes the actual environment of a project
  - It often focuses on cultural practices
  - It has long duration
  - It relies on large amount of observation data
- A ethnographic study can be seen as a specialized type of case study



# [ Survey vs. Case Study ]

- Survey is usually done in retrospect
  - Case study is done while a project is executed
- The purpose of surveys is to understand the population
  - Case Study targets a particular project

# [ Case Study vs. Experiment ]

- The level of control is lower in a case study
- Case studies are most observational
- Experiments are more controlled

# [ Comparative Table ]

	<b>Survey</b>	<b>Case Study</b>	<b>Experiment</b>
Design Type	Fixed	Flexible	Both
Qualitative / Quantitative	Both	Both	Quantitative
Execution Control	No	No	Yes
Control of Measure	No	Yes	Yes
Costs	Low	Medium	High
Replication	High	Low	High

# [ Bibliography ]

- C. Wohlin et al. **Experimentation in Software Engineering**, Springer. 2012.
  - Chapter 5 – Case Studies (up to Section 5.1)
  - Section 2.5 – Empirical Strategies Comparison