Case study research or anecdotal evidence?

Designing a case study

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Contents

• Planning
• Defining scope and goal of a case study
• Setting up contracts with the studied organization
  – Ethics
  – Secrecy and publicity
Planning in flexible designs

[Yin03 p23]

• Contradiction?

• Columbus
  – Asked for three ships. Why not one? Or five?
  – Went westward. Why not south?
  – Purpose to find India

Purpose of a Case Study

Case study

Action research

• Explore
• Describe
• Explain
• Improve
Case study design
[Runeson12, Chap 3.2]

• Rationale—why this study?
• Objective—what to achieve?
• The case—what is studied?
• Theory—frame of reference
• Research questions—what to know?
• Methods—how to collect data?
• Selection strategy—where to seek data?

Rationale

• Academic
  – Novel contribution to knowledge
  – Theory
  – Hypothesis
• Industry
  – Benchmark
  – Assessment of candidate technology
  – Pilot study
Industry-Academia Collaboration

Table 1: Typical time horizons in industry–academia collaboration (years)

<table>
<thead>
<tr>
<th>Area</th>
<th>Industry</th>
<th>Academia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contracts</td>
<td>1–3</td>
<td>3–5</td>
</tr>
<tr>
<td>Goals</td>
<td>1/4–3</td>
<td>3–5</td>
</tr>
<tr>
<td>Results</td>
<td>0–3</td>
<td>3–10</td>
</tr>
<tr>
<td>Organization</td>
<td>1–3</td>
<td>5–10</td>
</tr>
<tr>
<td>Work practice</td>
<td>0–1/2</td>
<td>0–3</td>
</tr>
</tbody>
</table>


Unit(s) of analysis

- individual
- group
- process
- project
- product
- policy
- role
- event
- technology
Holistic vs embedded case studies

Single-case study

Context
Case = unit of analysis

Multiple-case study

Context 1
Case 1 = unit of analysis 1

Context 2
Case 2 = unit of analysis 2

Embedded case study

Context
Unit of analysis 1
Unit of analysis 2

Holistic vs embedded example

Context – XP in stage-gate

Case
Unit of analysis = ABB
Unit of analysis = Ericsson

Context – introduce agile

Case = Unit of analysis = Vodafone
## Example

<table>
<thead>
<tr>
<th></th>
<th>Single case</th>
<th>Multiple case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holistic</td>
<td>One project at one company is studied</td>
<td>Three projects at three different projects are studied</td>
</tr>
<tr>
<td>Embedded</td>
<td>Two projects within one company, or one project and one role</td>
<td></td>
</tr>
</tbody>
</table>

## Design

### Case study research questions

**How?**
- Exploratory
- Descriptive
- Explanatory
- Improving

**Why?**
Propositions/theories

- Underlying assumptions about the case
- Theory [Webster's dictionary]:
  3: the general or abstract principles of a body of fact, a science, or an art
  5: a plausible or scientifically acceptable general principle or body of principles offered to explain phenomena
  6 a: a hypothesis assumed for the sake of argument or investigation b: an unproved assumption

Use of theory is scarce in SE
- At a minimum, map existing literature
Generalization [Yin03 p32-33]

- Drawing conclusions about phenomena outside the studied setting
  - Statistical generalization – “inference... about a population on the basis of empirical data collected about a sample”
  - Analytic generalization – “a previously developed theory is used as a template... to compare the empirical results of a case study”

Sampling in general

- Define the population
- Sample a subset of the population
- Investigate the subset
- Generalize to the population

- Example: national poll
Sampling/selection in case studies

Select cases to achieve variability. True sampling is impossible.

**Literal replication** – predicts similar results

**Theoretical replication** – predicts contradictory results for predictable reasons

*Runeson et al 2012*

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**Case selection**

**Case types**
- Extreme/deviant
- Maximum variation
- Critical
- Paradigmatic

**Focus on**
- Unusual cases
- Significance and validity
- Benchmark
- Methaphor

*Runeson et al 2012, p33 after Flyvbjerg 2007*
Task on “your” case study

- Which are the research questions? Are they clear enough? Defined “after-the-fact”?
- Characterize
  - Single/multiple; holistic-embedded
- Which are the units of analysis?
- Which propositions are made? Theory used?

[Runeson12, appendix A.1 p203]
Ethics – the (bad) state of practice

Hall and Flynn survey (2001) of CS&SE dept in UK:
• 36% considering ethical aspects important
• 39% neither or
• 18% not important
• 7% don’t know

Employee Monitoring Software
Deter, detect and detail harmful employee activity across Windows and Mac devices

Learn How To Implement An Employee Monitoring Program With Spector 360
Spector 360 is a comprehensive user activity monitoring solution that enables companies to log, retain, review, and report on employee activity when there is cause to do so.

Avoid Becoming A Statistic
Spector 360 is a comprehensive user activity monitoring solution that enables companies to log, retain, review and report on employee activity. Spector 360 creates a definitive record of an employee’s digital behavior, and in doing so provides organizations with the ability to see the context of user actions.

Using a combination of keyword detection and snapshot playback, Spector 360 monitors, captures and analyzes all PC and Mac computer user or user group activity, including:
Ethics

• Participants in general:
  – Obtain informed consent
  – Identify sensitive results (anonymity?)
  – Decide on inducements
  – Avoid deception
  – Feedback results, in particular quotations

Ethical considerations

• Before the study
• During the study
• After the study
Ethics – Before the study

• Being asked to participate
  – Is “no” a possible answer?
  – Who should be asked?
• Document informed consent in writing

Ethics – During the study

• Participants
  – Informing subjects may destroy the study
  – Physical/mental stress?
  – Privacy
• Difficult findings – whistle-blowers
• Artifacts, derived for other purposes?
  – Consent from creators?
Ethics – After the study

• How to handle
  – Anonymity?
  – Answers, not asked for?
  – Data used for multiple purposes?

Ethical dilemmas 1(3)

1. An employee knowingly misled a superior, to protect themselves, in the presence of the researcher and the researcher knew the employee was misleading the superior
2. A mandatory process was not followed by a team
Ethical dilemmas 2(3)

3. Resolving inconsistencies in accounts of a situation would reveal the identify of individual employees

4. A superior unexpectedly joins a sensitive group interview with employees

5. Analysis by the researcher could reveal the identify of employees in a poorly performing department

Ethical dilemmas 3(3)

6. Toward the completion of some research, a superior wanted to distribute the findings more broadly in the organization, to help improve the organization, but this would reveal weaknesses in the studied department

7. Information is provided privately e.g., upon completion of the formal part of an interview
Task

Discuss one ethical dilemma in pairs:
What can you do:
• before
• during
• after
the study?

Design

General Techniques to Manage Ethical Dilemmas

• Manipulate data – anonymize, abstract
• Develop multiple reports for different stakeholders
• Feedback and review opportunities for participants
• Use external parties for tasks
Documentation

- Company contract
- Consent form
- Case study protocol

Design

Documentation – company contract

- Purpose
  - Lay down the legal foundation for the collaboration
  - Establish procedures for approval, secrecy, integrity…
  - In Sweden, the Secrecy Act is the basis Offentlighets- och sekretesslag (2009:400 §)
Documentation – consent form

- **Purpose**
  - Clarify conditions for the study
    - Procedures
    - Voluntariness
    - Risks
    - Benefits
    - Confidentiality
    - (Review board approval)
    - Use for other purposes

Documentation – case study protocol

- **Purpose**
  - Communicate across researchers
  - Story history for reporting and review
  - Log book for actions and events
1. Background
2. Design
3. Case selection
4. Procedures and roles
5. Data collection
6. Analysis
7. Validity
8. Study limitations
9. Reporting
10. Schedule
11. Appendices