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ReTraCE

Realising the Transition towards the Circular Economy

Case Study Research

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Content

- Terminology
- Case Study Process
- Quality of Research

Relevant Situations for different research settings

Strategy	Form of Research Question	Requires Control of Behavioral Events?	Focuses on Contemporary Events?
Experiment	**How, why?**	**Yes**	**Yes**
Survey	**Who, what, where, how many, how much?**	**No**	**Yes**
Archival analysis	**Who, what, where, how many, how much?**	**No**	**Yes/No**
History	**How, why?**	**No**	**No**
Case study	**How, why?**	**No**	**Yes**

📖 Yin, R. K. (2003): Case Study Research – Design and Methods, 3rd. Edition, Sage, Thousand Oaks, p. 5.

Case Study – a Definition

- A case study is an empirical inquiry that
  - Investigates a contemporary phenomenon within its real-life context, especially when
  - The boundaries between the phenomenon and the context are not clearly evident.
- The case study inquiry
  - Copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result
  - Relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result
  - Benefits from the prior development of theoretical propositions to guide data collection and analysis

📖 Yin, R. K. (2003): Case Study Research – Design and Methods, 3rd. Edition, Sage, Thousand Oaks, p. 13.

Case Study – a second Definition

- A case study is a history of a past or current phenomenon, drawn from multiple sources of evidence. It can include data from direct observation and systematic interviewing as well as from public and private archives. In fact, any fact relevant to the stream of events describing the phenomenon is a potential datum in a case study, since context is important.

📖 Leonard-Barton, D. (1990): A dual methodology for case studies: synergistic use of a longitudinal single site with replicated multiple sites, in: Organisation Science, Vol. 1, No. 1, pp. 248-266.

Case Study – Different types

- An **exploratory case study** is aimed at defining the questions and hypotheses of a subsequent study (not necessarily a case study) or at determining the feasibility of the desired research procedure.
- A **descriptive case study** presents a complete description of a phenomenon within its context.
- An **explanatory case study** presents data bearing on cause-effect relationships – explaining how events happened.

📖 Yin, R. K. (2003): Applications of Case Study Reserach, Sage, Thousand Oaks, p. 7.

Case Study – Aims (1)

Purpose	Research question	Research structure
Exploration		
Uncover areas for research and theory development	**Is there something interesting enough to justify research?**	**In-depth case studies Unfocused, longitudinal field study**
Theory building		
Identify/describe key variables Identify linkages between variables Identify "why" these relationships exist	**What are the key variables? What are the patterns or linkages between variables? Why should these relationships exist?**	**Few focused case studies In-depth field studies Multi-site case studies Best-in-class case studies**

📖 Voss, C./Tsikriktsis, N./Frohlich, M. (2002): Case research in operations management, in: International Journal of Operations Management, Vol. 22, No. 2, pp. 195-219.

Case Study – Aims (2)

Purpose	Research question	Research structure
Theory testing		
Test the theories developed in the previous stages Predict future outcomes	**Are the theories we have generated able to survive the test of empirical data? Did we get the behaviour that was predicted by the theory or did we observe another unanticipated behaviour?**	**Experiment Quasi-experiment Multiple case studies Large-scale sample of population**
Theory extension/refinement		
To better structure the theories in light of the observed results	**How generalisable is the theory? Where does the theory apply?**	**Experiment Quasi-experiment Case studies Large-scale sample of population**

📖 Voss, C./Tsikriktsis, N./Frohlich, M. (2002): p. 198.

Single case versus multiple case designs

- Single case as a critical example, e.g. in testing a well-defined theory
  - An extreme or unique case, e.g. if not many cases are available
  - A typical or representative case, standing as an example of a wider group of cases
  - A revelatory case, where the investigator has an opportunity to observe and analyse a phenomenon inaccessible to scientific investigation
  - A longitudinal case studying a case at two or more points in time
  - A pilot in a multi-case setting
- Multiple cases
  - Use of a replication logic or of a sampling logic

📖 Yin, R. K. (2003): Case Study Research – Design and Methods, 3rd. Edition, Sage, Thousand Oaks, p. 40-47.

Holistic versus embedded designs

- Number of units of analysis in a case study
  - Holistic case studies examine the global nature of an organisation
  - Embedded case study designs build on different units of analysis, e.g. departments in a company

📖 Yin, R. K. (2003): Case Study Research – Design and Methods, 3rd. Edition, Sage, Thousand Oaks, p. 40.

The Case Study Process

1. Getting Started
2. Selecting Cases
3. Crafting Instruments and Protocols
4. Entering the Field
5. Analyzing Data
6. Shaping Hypotheses
7. Enfolding Literature
8. Reaching Closure

📖 Eisenhardt, K. M. (1989): Building theory from case study research, in: Academy of Management Review, Vol. 14, No. 4, pp. 533.

Step 1 – Getting Started

- Definition of research question
  - Focuses efforts
- Possibly a priori constructs
  - Provides better grounding of construct measure
- Neither theory nor hypotheses
  - Retains theoretical flexibility

📖 Eisenhardt, K. M. (1989): Building theory from case study research, in: Academy of Management Review, Vol. 14, No. 4, pp. 533.

Step 2 – Selecting Cases

- Specified population
  - Constrains extraneous variation and sharpens external validity
- Theoretical, not random sampling
  - Focuses efforts on theoretical useful cases – i.e. those that replicate or extend theory by filling conceptual categories

📖 Eisenhardt, K. M. (1989): Building theory from case study research, in: Academy of Management Review, Vol. 14, No. 4, pp. 533.

Designing Case Studies

- Research design
  - Defined as a plan that guides the investigator in the process of collecting, analyzing, and interpreting observations. It is a logical model of proof that allows the researcher to draw inferences concerning causal relations among the variables under investigations.
- Five components (for case studies)
  - A study‘s question
  - Its propositions, if any;
  - Its unit(s) of analysis;
  - The logic linking the data to the propositions; and
  - The criteria for interpreting the findings.

📖 Yin, R. K. (2003): Case Study Research – Design and Methods, 3rd. Edition, Sage, Thousand Oaks, p. 21.

📖 Nachmias, D./Nachmias, C. (1992): Research methods in the social sciences, St. Martin`s, New York, pp. 77-78.

Choice of number and types of Cases

Choice	Advantage	Disadvantages
Single cases	**Greater depth**	**Limits on the generalisability of conclusions drawn. Biases such as misjudging the representativeness of a single of a single event and exaggerating easily available data**
Multiple cases	**Augment external validity, help guard against observer bias**	**More resource needed, less depth per case**
Retrospective cases	**Allow collection of data on historical events**	**May be difficult to determine cause and effect, participants may not recall important events**
Longitudinal cases	**Overcome the problems of retrospective cases**	**Have long elapsed time and thus may be difficult to do**

📖 Voss, C./Tsikriktsis, N./Frohlich, M. (2002): Case research in operations management, in: International Journal of Operations Management, Vol. 22, No. 2, p. 203.

Step 3 – Crafting Instruments and Protocols

- Multiple data collection methods
  - Strengthens grounding of theory by triangulation of evidence
- Qualitative and quantitative data combined
  - Synergistic view of evidence
- Multiple investigators
  - Fosters divergent perspectives and strengthens grounding

📖 Eisenhardt, K. M. (1989): Building theory from case study research, in: Academy of Management Review, Vol. 14, No. 4, pp. 533.

Six Sources of Evidence: Strenghts and Weaknesses (1-2)

Source of Evidence	Strengths	Weaknesses
Documentation	• **Stable: can be reviewed repeatedly** • **Unobtrusive: not created as a result of the case study** • **Exact: contains exact names, references, and details of an event** • **Broad coverage: long span of time, many events, and many settings**	• **Retrievability: can be low** • **Biased selectivity: if collection is incomplete** • **Reporting bias: reflects (unknown) bias of author** • **Access, may be deliberately blocked**
Archival records	• **(Same as above for documentation)** • **Precise and quantitative**	• **(Same as above for documentation)** • **Accessibility due to privacy reasons**

📖 Yin, R. K. (2003): Case Study Research – Design and Methods, 3rd. Edition, Sage, Thousand Oaks, p. 86.

Six Sources of Evidence: Strenghts and Weaknesses (3-4)

Source of Evidence	Strengths	Weaknesses
Interviews	• **Targeted: focuses directly on case study tropic** • **Insightful: provides perceived causal inferences**	• **Bias due to poorly constructed questions** • **Response bias** • **Inaccuracies due to poor recall** • **Reflexivity: interviewee gives what interviewer wants to hear**
Direct Observations	• **Reality: covers events in real time** • **Contextual: covers context of event**	• **Time: consuming** • **Selectivity: unless broad coverage** • **Reflexivity: event may proceed differently because it is being observed** • **Cost: hours needed by human observers**

📖 Yin, R. K. (2003): Case Study Research – Design and Methods, 3rd. Edition, Sage, Thousand Oaks, p. 86.

Six Sources of Evidence: Strenghts and Weaknesses (5-6)

Source of Evidence	Strengths	Weaknesses
Participant Observation	• **(Same as above for direct observations)** • **Insightful into interpersonal behaviour and motives**	• **(Same as above for direct observations)** • **Bias due to investigator`s manipulation of events**
Physical Artifacts	• **Insightful into cultural features** • **Insightful into technical operations**	• **Selectivity** • **availability**

📖 Yin, R. K. (2003): Case Study Research – Design and Methods, 3rd. Edition, Sage, Thousand Oaks, p. 86.

Three Principles of Data Collection

- Use multiple sources of evidence
- Create a case study database
- Maintain a chain of evidence

📖 Yin, R. K. (2003): Case Study Research – Design and Methods, 3rd. Edition, Sage, Thousand Oaks, p. 97.

Step 4 – Entering the field

- Overlap data collection and analysis, including field notes
  - Speeds analysis and reveals helpful adjustments to data collection
- Flexible and opportunistic data collection methods
  - Allows investigators to take advantage of emergent themes and unique case features

📖 Eisenhardt, K. M. (1989): Building theory from case study research, in: Academy of Management Review, Vol. 14, No. 4, pp. 533.

Step 5 – Analyzing the data

- Within-case analysis
  - Gains familiarity with data and preliminary theory generation
- Cross-case pattern search using divergent techniques
  - Forces investigators to look beyond initial impression and see evidence through multiple lenses

📖 Eisenhardt, K. M. (1989): Building theory from case study research, in: Academy of Management Review, Vol. 14, No. 4, pp. 533.

Step 6 – Shaping hypothesis

- Iterative tabulation of evidence for each construct
  - Sharpens construct definition, validity, and measurability
- Replication, not sampling, logic across cases
  - Confirms, extends, and sharpens theory
- Search evidence for “why” behind relationships
  - Builds internal validity

📖 Eisenhardt, K. M. (1989): Building theory from case study research, in: Academy of Management Review, Vol. 14, No. 4, pp. 533.

Step 7 – Enfolding the literature

- Comparison with conflicting literature
  - Builds internal validity, raises theoretical level, and sharpens construct definitions
- Comparison with similar literature
  - Sharpens generalizability, improves construct definition, and raises theoretical level

📖 Eisenhardt, K. M. (1989): Building theory from case study research, in: Academy of Management Review, Vol. 14, No. 4, pp. 533.

Step 8 – Reaching Closure

- Theoretical saturation when possible
  - Ends process when marginal improvement becomes small.

📖 Eisenhardt, K. M. (1989): Building theory from case study research, in: Academy of Management Review, Vol. 14, No. 4, pp. 533.

Criteria for Judging the Quality of Research

- Construct validity
  - Establishing correct operational measures for the concepts being studied
- Internal validity (for explanatory or causal studies only)
  - Establishing a causal relationship, whereby certain conditions are shown to lead to other conditions, as distinguished from spurious relationships
- External validity
  - Establishing the domain to which a study`s findings can be generalized
- Reliability
  - Demonstrating that the operations of a study – such as the data collection procedures – can be repeated, with the same results

📖 Yin, R. K. (2003): Case Study Research – Design and Methods,3rd. Edition, Sage, Thousand Oaks, p. 34.

Case Study Tactics for Four Design Tests

Tests	Case Study Tactic	Phase of research in which tactic occurs
Construct Validity	• Use multiple sources of evidence • Establish chain of evidence • Have key informants review draft case study report	• Data collection • Data collection • Composition
Internal Validity	• Do pattern-matching • Do explanation-building • Address rival explanations • Use logic models	• Data analysis • Data analysis • Data analysis • Data analysis
External Validity	• Use theory in single-case studies • Use replication logic in multiple-case studies	• Research design • Research design
Reliability	• Use case study protocol • Develop case study database	• Data collection • Data collection

📖 Yin, R. K. (2003): Case Study Research – Design and Methods, 3rd. Edition, Sage, Thousand Oaks, p. 34.

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