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Introduction

- Case and action research strategies are among the best in human-centered design research
  - Investigating holistic and meaningful characteristics of real-life events
  - Makes the research practical and ensures that the developed methods and processes are usable in practice
What is case study research?

- A case study is an empirical inquiry within its real-life context, particularly when the boundaries between phenomena and context are not clearly evident (Yin, 1994)
- A common research strategy in different disciplines (social and organizational sciences, economics)
Case study research in practice

- The researcher has a role of detached observer
- Small sample
- Data gathering methods can be both quantitative and qualitative
Case studies - when to apply?

- Answering to “how” or “why” questions
- Broad and complex phenomenon
- A phenomenon cannot be studied outside the context in which it occurs
- To find relevant issues for theory
- To capture process, time related data
Single-case design (Yin, 2003)

• Critical test of existing theory
  - Are a theory’s propositions correct or are alternative explanations more relevant

• Extreme, unique, representative, typical, revelatory (phenomenon previously inaccessible) or longitudinal case

• Holistic vs. embedded case design (more than one unit of analysis)
Multiple-case designs (Yin, 2003)

- Each case either (a) predicts similar results (a *literal replication*)
- Or (b) predicts contrasting results but for predictable reasons (a *theoretical replication*)
Multiple case studies (Dubé and Paré, 2003)

• Helps to understand the influence of variability of context and to gain more general research results

• Within-case analysis: individual cases are analyzed
  - Gives a rich familiarity with each case, which accelerates cross-case comparison

• Cross-case analysis: the results of multiple cases are compared and combined
Investigator skills (Yin, 2003)

- Asks good questions
- Is a good listener
- Is adaptive and flexible
- Has a firm grasp of the issues being studied
- Is unbiased by preconceived notions (sensitive and responsive to contradictory evidence)
Preparing for data collection (Yin, 2003)

• Prepare a case study protocol
  - Goals, procedures, questions and instructions for the case
• Select case study “sites” or individuals
• Pilot case study and refine your data collection plans
Collecting data: sources

- Documentation
  - Existing measures and evaluations
- Statistics
- Interviews and surveys
- Direct or participant-observation (e.g. meetings)
- Physical artifacts
  - Testing the resulting product
Example of measured attributes (Kujala, 2002)

<table>
<thead>
<tr>
<th>Factors</th>
<th>Attributes</th>
<th>Expl. of attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product development performance</td>
<td>Development time</td>
<td>...</td>
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<tr>
<td></td>
<td>Costs</td>
<td>...</td>
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<td>Quality of requirements</td>
<td>Completeness</td>
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<td></td>
<td>Correctness</td>
<td>...</td>
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<td>Usability</td>
<td>Ease of use</td>
<td>...</td>
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</tbody>
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Three principles of data collection (Yin)

1. Use multiple sources of evidence
   - Called *triangulation* (data sources, investigator, theory, methodological)

2. Create a case study database
   - Case study notes (incl. exact phrases)
   - Documents

3. Maintaining a chain of evidence
Data analysis strategies (Yin, 2003)

- Relaying on theoretical propositions
- Thinking about rival explanations
- Developing a case description
Data analysis techniques (Yin, 2003)

• Pattern matching
  - Comparing empirical pattern with a predicted
• Explanation building
• Time-series analysis
• Logic models
• Cross-case synthesis
Improving the quality of case studies (Kalle Lyytinen)

- Define research questions, anchor into theory
- Use within and between case analysis
- Be clear about sampling
- Validate/test your instruments
- Identify natural controls
- Use multiple sources of data for triangulation
- Search for alternative explanations
- Report your data collection process, threats to reliability, method bias
- Use all data, including field notes
- User study protocol and methods to map data to constructs
- Use quotes or other field data
Action research

• Combines practical problem-solving and scientific research
  - Includes intervention and investigating its effects
  - Situational, collaborative, participatory and self-evaluative
• Researcher actively involved and collaborating with practitioners
• Roots on educational, social and organizational sciences
Action research – when to apply?

- To address complex real-life problems
- To understand social practices and the change processes in social systems (Hult and Lennung, 1980)
- To enhance the competence of the respective actors, training
Action research process

- Problem diagnosing (identifying and defining problems)
- Action planning
- Specifying learning
- Action intervention
- Evaluating
Criticism of action research (Tuomi & Sarajärvi, 2002)

- Situation specific, sample not representative, no control of experiments
- Goals and methods can be unclear
- Difficult to keep distant and neutral, no equal dialog between the researcher and the object
- Researchers may search solutions to their own problems in which practitioners are not interested
Case study research

Action research literature