Strathmore Business School

Research designs: an overview

MMBA 8109: Research Methods

Learning outcomes

By the end of this session, you should be able to:

- Identify the elements of research design.
- Understand the need to achieve methodological coherence.
- Explain the differences between quantitative, qualitative and mixed methods approaches.
- Identify the main research designs.
- Identify issues that affect the quality of research.

Definition

- A research design provides the framework for the collection & analysis of data.
- It is the general plan of how you [the researcher] intend to conduct your research to answer your research questions and in a way that ensures research quality.

Introduction

- The research design reflects the decisions around the following elements:
  a) Purpose of the study (exploration, descriptive, explanatory)
  b) Type of study (causal or correlational study; observational study or case study)
  c) Researcher involvement (minimal or control through manipulation/simulation)

Introduction

d) Study setting (natural / contrived)

e) Measurement (operational definitions, measures)

f) Unit of analysis (study population)

- Sampling design

g) Time horizon (cross-sectional/longitudinal)

h) Quality of data (minimal bias & maximum reliability)

Research Purpose

- The purpose of the study may either be:
  1. Exploratory
  2. Descriptive
  3. Explanatory
  - *It could be a combination of the above e.g. descriptive and explanatory; exploratory and descriptive.*

Research Purpose

- **Exploratory study**: It is undertaken when not much is known about the phenomenon or limited information is available.
  - The aim is to enhance understanding of a particular phenomenon or to develop a viable theoretical framework.
  - An exploratory study is flexible and adaptable to change.

Research Purpose

- **Descriptive study**: It is undertaken to gain an accurate profile of events, persons or situations.
  - The 'who, what, when, where and how' questions.
  - Description is a means to an end and not an end in itself. Graduate research cannot be purely descriptive.
  - Qualitative research is descriptive in nature.

Research Purpose

- **Explanatory study**: It is undertaken to establish causal relationships between variables.
  - It can also explain the nature of certain relationships between variables through hypothesis testing.
  - Hypothesis testing is used to explain the variance in the dependent variable or to predict policy/ organizational outcomes.

Research Purpose

- **Case study analysis**: It involves an in-depth, contextual analysis of a phenomenon.
  - Case studies are useful in understanding certain phenomena, and generating theories for empirical testing.
  - They can also be useful in applying solutions to current problems based on past experiences.
  - Case studies are qualitative in nature but can be part of a mixed methods research design.

Research design types

- Experiment.
- Survey.
- Cross-sectional or Longitudinal study
- History
- Case study.
- Ethnography.
- Action research.
- Narrative inquiry.

Causal vs. Correlational studies

- A **causal study** is done to establish a cause-and-effect relationship. It means controlling for all other variables and ensuring internal validity (e.g. experiments).
- Causal studies face the challenge of establishing attribution: To what extent can we attribute the variable **y** to the variable **x**?
- Impact studies are one form of causal studies.

Causal vs. Correlational studies

- A **correlational study** is done to define the important variables associated with a problem.

Causal vs. Correlational studies

Examples

- Does smoking cause cancer?
- *(A causal study question)*

- Are smoking and cancer related?
- *(A correlational study question)*

Causal vs. Correlational studies

Examples

- Fears of future terrorist attacks at the Coast led to an unprecedented number of European tourists cancelling their holiday visits.
- Increases in interest rates and property taxes, the global recession and recent terrorist attacks have considerably slowed down direct foreign investment in Kenya.

Unit of analysis

- *The research question determines the unit of analysis.*

Unit	Example
Individual	Employee motivation in an organization
Group	Customer service standards in an insurance firm
Organization	Demand management systems in a tyre manufacturer
Industry	Competitive strategies for Five-Star Hotels in Nairobi
Country	Profitability of bank subsidiaries in the East African region.

Quantitative research

- **Research focus**: Explain & predict.
- **Research approach**: Deductive (using data to test theory).
- **Characteristics**:
  - Examines relationships between variables
  - Numerical (precise) measurement.
  - Data analysis using statistical techniques.
  - Probability sampling techniques (Large sample size).

Quantitative research

- **Characteristics**:
  - Incorporates controls to ensure validity of data (experimental design).
  - Structured & standardized data collection instruments.
  - Researcher is independent from those being researched (to minimize bias).
  - Subjects of the study are called respondents.

Quantitative research

- **Research Designs**:
  - Experiment: true or quasi-experiment
  - Survey research
  - Archival research (makes use of both recent and historical records and documents)
    - Use of secondary data to build time series models of economic data e.g.
    - *Time series analysis of the effects of electric power network expansion on economic growth in Kenya (Gewa, 2013).*

Qualitative research

- **Research focus**: Describe and interpret.

  Research that aims to tell the researcher how (process) and why (meaning) things happen as they do. The purpose is to gain in-depth understanding.

- **Research approach**: Inductive (using data to build theory)
  - *In practice, much qualitative research uses an **abductive** approach, where inductive inferences are developed and deductive ones tested iteratively throughout the research e.g. in grounded theory (Saunders et al., 2012).*

Qualitative research

- **Characteristics**:
  - Researcher aims to gain an in-depth understanding.
  - Non-standardised data collection (emergent and flexible) that uses multiple methods.
  - Unstructured or semi-structured data collection instruments.
  - Non-probability sampling techniques (Small sample size).

Qualitative research

- **Characteristics**:
  - Researcher is dependent on the participants for cognitive access to their data. The researcher must therefore build rapport and demonstrate sensitivity to gain the trust and confidence of the participants.
  - Research takes place in the natural setting of the participants.
  - Data analysis through thematic content analysis.

Qualitative research

- **Research designs**:
  - Action research *e.g. Employee relations in a large telecommunications company undergoing a merger/acquisition.*
  - Case study research e.g. *Tourism development in Isiolo county.*
  - Narrative Inquiry *e.g. 'Lest we forget': Stories of the 2008 Post-election violence survivors.*
  - Grounded theory *e.g. Awareness of dying by Glaser & Strauss (1967).*
  - Archival research *e.g. "The Making of a Nation" by Hilary Ng'weno (2008).*

Mixed methods research

- **Research focus**: To enhance research quality.
- **Research approach**: May use either a deductive or inductive approach, or combine both.
  - A theoretical perspective may be used to provide some direction for the research and limit its scope.
  - Quant/Qual. data can be used sequentially to develop a richer theoretical perspective.

Mixed methods research

- **Characteristics**:
  - Uses multiple data collection techniques and analytical procedures to answer the research questions (Quant & Qual. data).
  - Quant/Qual. research is partially integrated within a single phase, usually sequentially (simple design).
  - Fully integrated Quant/Qual. research with multiple phases running concurrently (complex design).

Strathmore Business School

Summary of research designs

Quantitative	Qualitative	Mixed methods
• Experiment • Survey • Longitudinal study • Archival research (Secondary data analysis) • Meta-analysis/ Systematic reviews	• Narrative inquiry • Ethnography • Grounded theory • Phenomenology • Case Study • Historical analysis	• Convergent: Quant/Qual integrated in a single phase • Explanatory sequential Quant (data collection & analysis) then Qual, & finally Interpretation. • Exploratory, sequential • Qual builds to Quant then Interpretation • Multi-phase: Concurrent Quant & Qual research phases

1. Experiment

- Often regarded as the gold standard against which the methodological rigour of other research strategies is assessed.
- Commonly used in psychology and medical research (randomized control trials).
- Its purpose is to examine possible cause-and-effect relationships among variables.

Experiment

- To establish that a change in the independent variable (IV) causes a change in the dependent variable (DV), all four of these conditions should be met:
    1. The IV and the DV should **co-vary**.
    2. The IV (presumed causal factor) should **precede** the DV.
    3. No other factor should be a **possible cause** of the change in the DV.
    4. A **theory** is needed to explain why the IV affects the DV.

Field Experiment

- This is an experiment done in the natural environment in which life goes on as usual, but treatments are given to one or more groups (*circumcision in HIV/AIDS prevention*).
- The experimental and control groups in the field experiment may be composed of households within a certain radius, or from different households in the same location.

Internal and External Validity

- **Internal validity** – the degree of confidence that variable X causes variable Y.
- **External validity** – the extent of generalizability to other settings, people or events.
- Field experiments have more external validity but less internal validity compared to lab experiments. (*The reverse is true for lab experiments.)*

Factors affecting the validity of experiments

History effects (of events)	**Mortality effects** (changes in group composition)
Maturation effects (passage of time)	**Statistical regression effects** (extreme scorers on both ends will regress toward the mean)
Testing effects (exposure to pre-test affects post-test observations / reactions to treatment)	**Instrumentation effects** (changes in the measuring instrument)
Selection bias effects (improper/unmatched selection of subjects for control and experimental groups)	

Researcher implications

1. Is it really necessary to identify a causal relationship or would it suffice to identify the correlation between variables?
2. Which of the two, internal validity or external validity is required more?
3. Is cost an important factor in the study? Would a less sophisticated experimental design suffice?

2. Survey

- This is a popular business/management research strategy.
- It allows the collection of quantitative data that can then be analysed using descriptive and inferential statistics.
- It is critical to ensure that your sample is representative if you intend to extrapolate findings to the whole population.

2. Survey

- It is also important to ensure that you get a good response rate (30% minimum).
- The questionnaire needs to be well designed to ensure internal validity as well as pre-tested to improve reliability.

3. Archival research

- This strategy uses administrative records and documents as the primary sources of data.
- It involves secondary data analysis i.e. data collected for a different purpose.
- It is an appropriate strategy for research questions that focus on past events and/or changes over time.
- It is dependent on an efficient archival system.

3. Archival research

- Its limitations include:
  - The lack of precise information required to answer your research questions.
  - Missing or incomplete data.
  - Denial of access to data (for confidentiality reasons).
- *Examples: "Imperial Reckoning: The Untold Story Of Britain's Gulag* in Kenya" by Caroline Elkins and *"Histories of the Hanged: The Dirty War in Kenya and the End of Empire"* by David Anderson.

4. Case study

- This strategy explores a research topic within its context.
- The acknowledgement of contextual variables makes it an antithesis of the experimental strategy where these variables are highly controlled.
- It is a relevant strategy if the researcher seeks a rich understanding of the context of the research.

4. Case study

- The case study is often used for exploratory and explanatory research. But it is also highly descriptive.
- One strength of the case study is its ability to accommodate both quantitative and qualitative methods (document review, interviews, observation and questionnaires).
- Data triangulation is therefore possible.

4. Case study

- Yin (2009) distinguishes four case study strategies:
  - Single case vs. Multiple cases.
  - Holistic case vs. Embedded case.
- A single case is usually chosen because it is an extreme or unique case (outlier) or because it is typical enough to develop theoretical propositions.

4. Case study

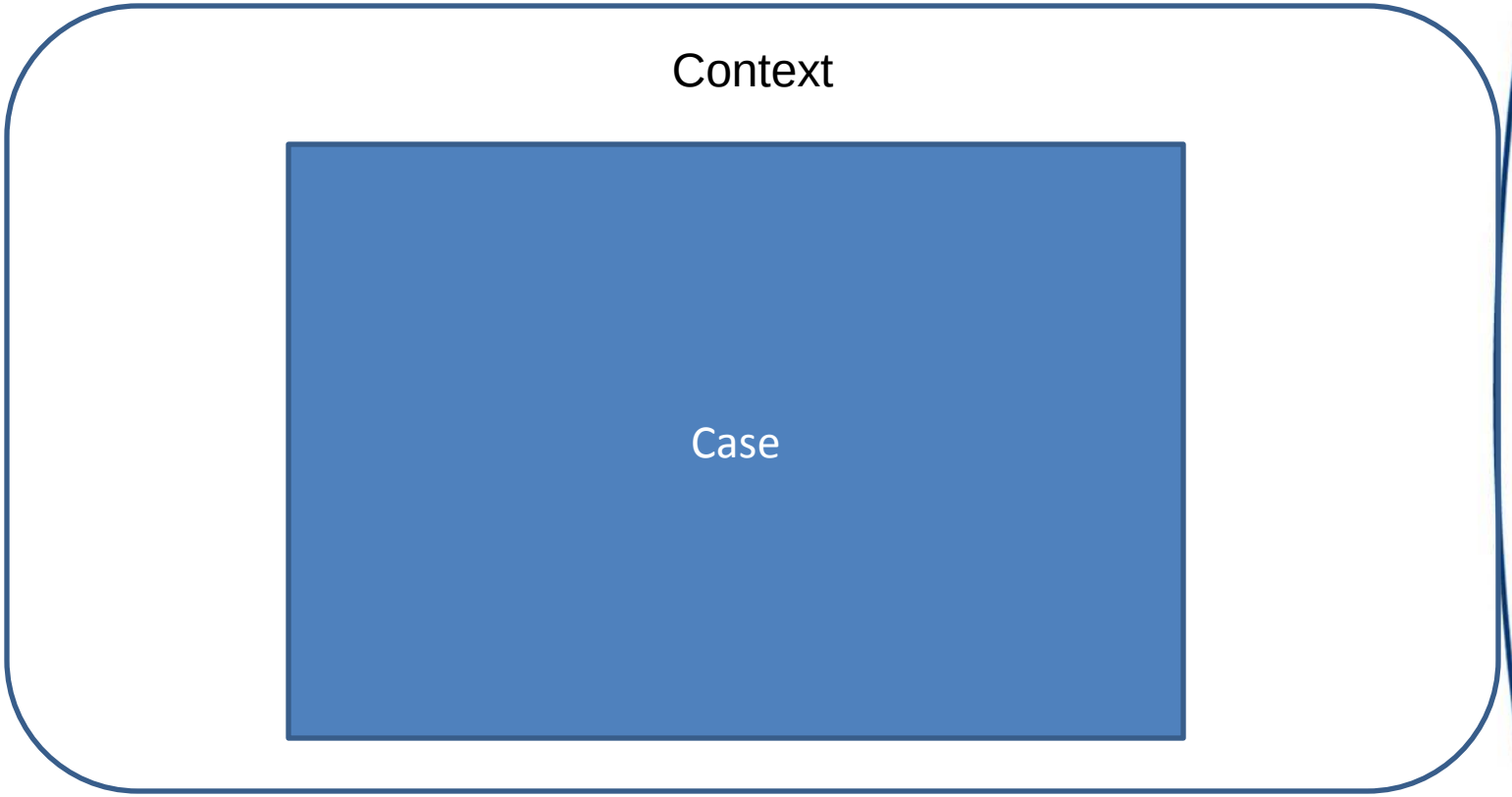
- Multiple cases are used when the focus is replication of findings across cases.
- **Literal replication** occurs when similar results are predicted to be produced for each case.
- **Theoretical replication** occurs when a predicted variation is realized due to a difference in a contextual factor.

(Yin, 2009)

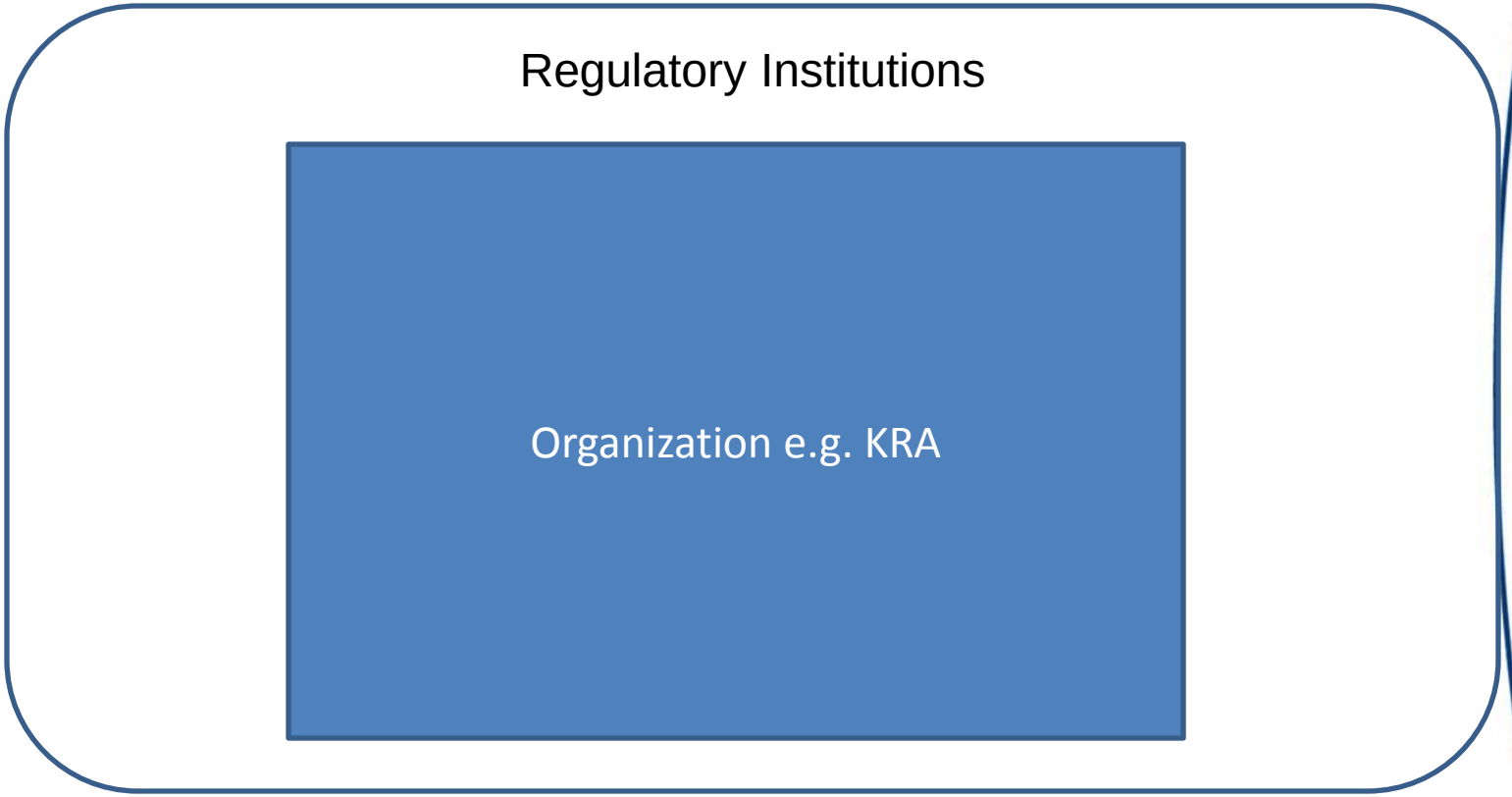
4. Case study

- Yin (2009) advocates for a deductive approach to case studies where theoretical propositions are proposed and tested through an iterative process of examining rival propositions.
- It is also possible to use an inductive or abductive approach where data is first collected and propositions generated, following which the propositions are tested.

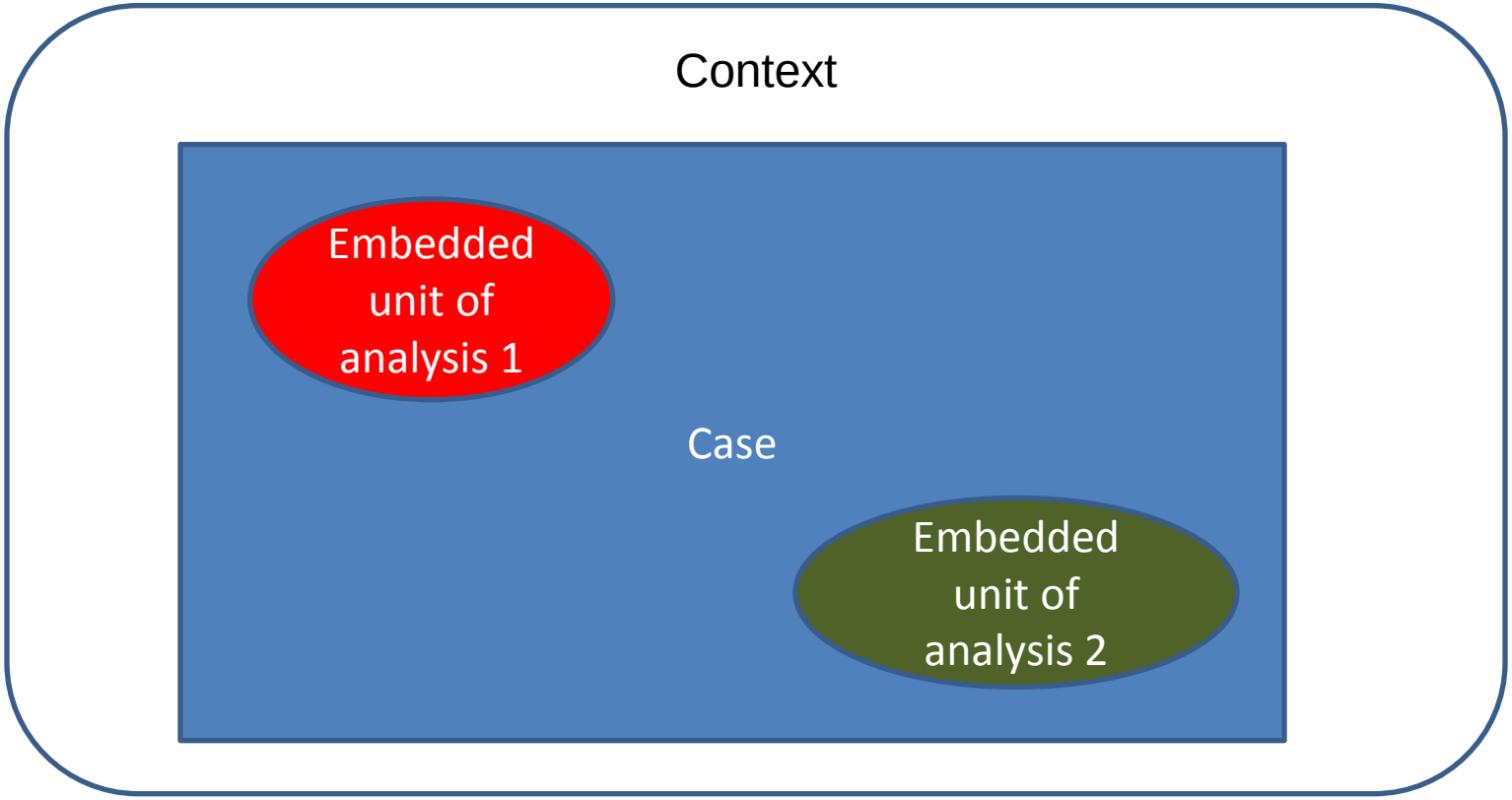
Holistic case: single unit of analysis



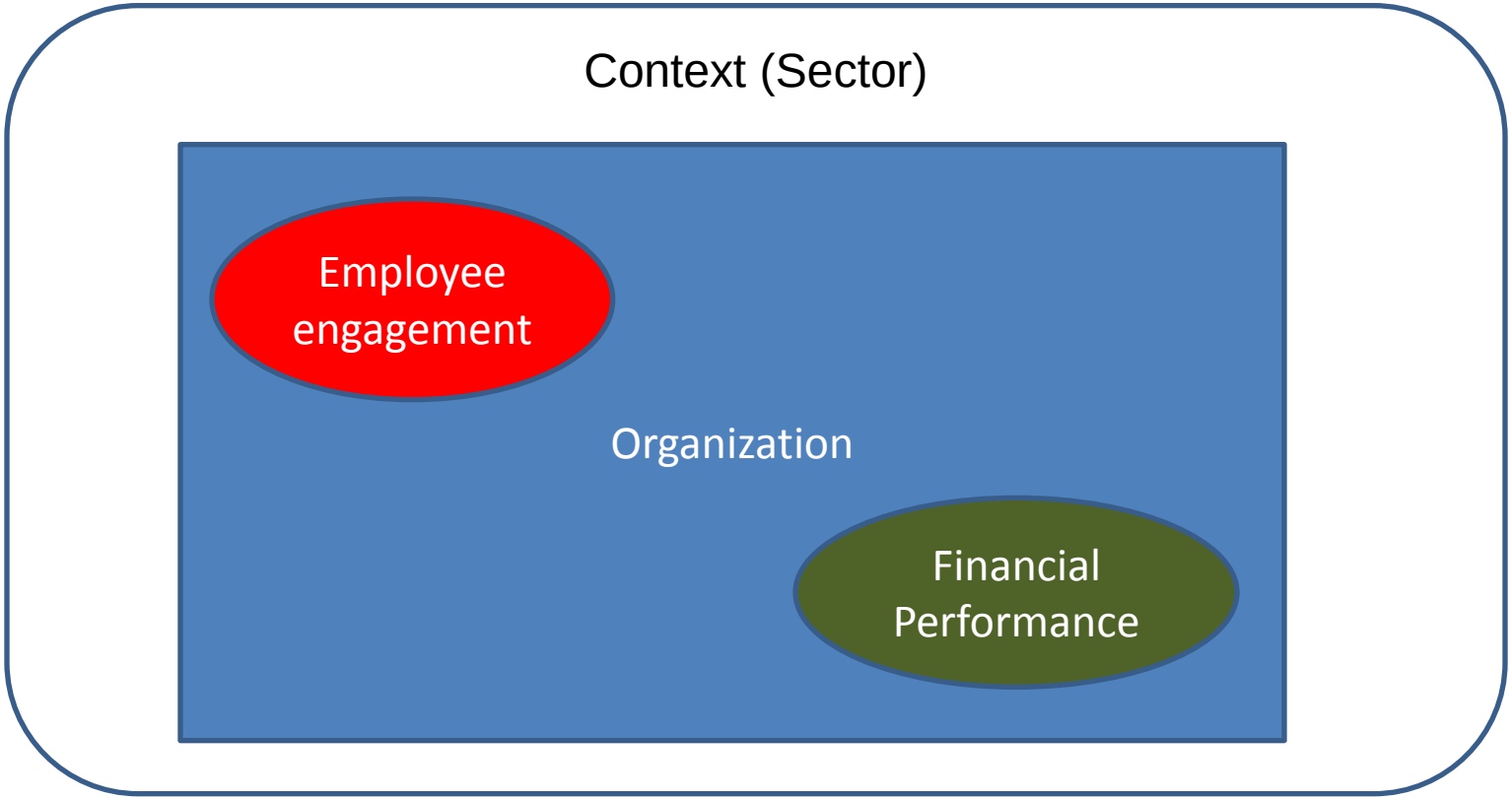
Holistic case: single unit of analysis



Embedded case: multiple units of analysis



Embedded case: multiple units of analysis



4. Case study

- A **major pitfall** regarding the embedded case design is when the researcher focuses only on the sub-unit level of analysis and fails to return to the larger unit of analysis.
  - E.g. A study of organizational effectiveness may involve a survey of individual employees as a sub-unit of study. The researcher needs to collect data from other sources within the organization otherwise the study will become an employee rather than an organizational study (Yin, 2009).

4. Case study

- Yin (2009) offers the following advice in selecting case study designs:

  A. ***Single or Multiple Case Design?***
  Multiple case designs are preferred over single-case designs. At least two cases are adequate.

  B. ***Closed or Flexible Designs?***
  Flexibility, because a case study's design can be modified by new information or discovery during data collection.

4. Case study

C. Mixed methods designs – mixing case studies with other strategies?

- Embedded case designs may rely on quantitative techniques to collect data about the sub-unit.
- The case study may be a component of a larger mixed methods study e.g. a survey of schools involves a case study of one of more schools.

- It is possible to mix case studies with other strategies but more time-consuming than single methods.

5. Ethnography

- This strategy is used to study groups of people and is associated with anthropology.
- It adopts an interpretive and naturalistic focus by using the language of those being studied in the written account.
- In management research, this strategy can be applied to study the interactions among people in a work group or within an organization (e.g. organizational culture).

6. Action research

- This strategy involves an emergent and iterative process of inquiry designed to develop solutions to real organizational problems through a participative and collaborative approach.
- The purpose of action research is to promote organizational learning and produce practical outcomes beyond the research project.

7. Grounded theory

- This strategy is used to develop theoretical explanations of social interactions and processes in a wide range of contexts.
- It is unique in that theory is developed from the data produced from the accounts of social actors.
- It uses specific analytical techniques and is time-consuming due to the requirement to reach theoretical saturation.

8. Narrative inquiry

- This strategy involves the construction of a narrative(s) by the researcher based on the participant(s)'s narration of events and experiences.
- It is associated with small, purposive samples due to its intensive and time-consuming nature (in-depth interviews & observations).
- It can be applied to study how people make sense of their organizational realities.

Addressing research quality

Quantitative research

1. Internal validity
2. External validity
3. Reliability
4. Objectivity

Qualitative research

1. Credibility
2. Transferability
3. Dependability
4. Confirmability

Addressing quality

- ***Internal validity*** can be enhanced by:
  - Extensive review of literature;
  - Careful definition of the topic;
  - Identification of measures to be scaled;
  - Choice of appropriate scales;
  - Use of experts to assess how well the instrument meets the standards.

Internal validity criteria

Type of internal validity	Description
1. Content validity	Does the measure adequately measure the concept?
2. Face validity	Do "experts" validate the measures in the instrument?
3. Construct validity	Does the instrument utilize the concept as theorized?

Addressing quality

2. ***External validity*** – the extent to which the results of a study can be generalised to similar populations in similar settings i.e. apply to situations beyond the study itself.

Addressing quality

- ***External validity*** of research can be enhanced by:
  - The use of real-life settings.
  - The use of a representative sample.
  - Replication in a different context (multiple case sampling).
  - Review of literature to identify patterns and similarities in settings, findings and conclusions.

Addressing quality

3. ***Reliability*** – the extent to which similar results can be replicated, or reproduced by another inquirer.

   – Will the research process yield **consistent** findings over time and across researchers and/or methods?

Addressing quality

- ***Reliability*** can be enhanced by:
  - Using a standardised instrument.
  - Re-testing respondents to confirm reliability of measure (test-retest reliability)
  - Checking the homogeneity of the items in the measure (Cronbach's alpha test).

(For Quantitative research)

Addressing quality

- ***Reliability*** can be enhanced by:
  - Transparency in subjective judgements – specifying the criteria that dictate the kinds of judgement the researcher makes.
  - In the case of interviews, conducting them during similar time periods and having the same interviewer.
  - Determining the level of respondents (e.g. senior executives).
  - Creating a chain of evidence (case study database).

  (For Qualitative research)

Addressing quality

4. ***Objectivity*** – the extent to which findings are free from bias.

   – Bias is defined as any influence, condition or sets of conditions that singly or together distort data.

   – This includes the researcher's implicit assumptions, biases and prejudices about the context or the research problem.

Addressing quality

- ***Objectivity*** can be enhanced by:
  - **Triangulation** i.e. use of multiple data sources; different data collection techniques; and different investigators to cross-check the data and its interpretation.
  - **Acknowledgement** of the researcher's bias that may be useful in interpreting findings and conclusions.

(For qualitative research)