RESEARCH IN BUSINESS
Module 2: Designing Your Research

Methodology

Methodology is the procedure or tools that you use to answer your research question. Methodology includes **data collection** and **data analysis**. While the methodology you will use may seem self-evident, you should take the time to consider your choice. This module will provide some questions and elements to consider during the following two stages: **designing** a methodology and **writing** about the methodology.

What do I want to know? What questions do my data need to answer?
Have your research question—and any secondary research questions—on hand when designing and writing about your research, and refer to the question(s) frequently to keep your research relevant.

Designing a Methodology

This section explores the factors and questions to consider when choosing a research methodology. Being aware of what led you to your choice of methodology will help support your choice when writing about your research.

-- *What or who am I going to study?*

Business research focuses primarily on three **research populations**:

- People
- Processes
- Products

-- *What assumptions am I making?*

Each researcher brings assumptions and theoretical perspectives to a study. Being aware of these underlying **paradigms** helps both to understand why a methodology might be chosen and to guard against bias in the research design (discussed later in this module).

-- *What kind of data do I need?*

The two main types of data are **qualitative** (emphasis on words as data) and **quantitative** (emphasis on numbers as data). The choice between these two can depend on the purpose of the research, the research population, and the type of research the audience values. Data can come in many forms, such as customer anecdotes, survey results, production output, or product testing results.

-- *What do I expect my results to show or offer?*

Based on your research question and your knowledge of the research subject, you should already have a reasonable expectation of what **results** your research should offer. Below are a few common categories; your research may provide one or more.

Interactions and relationships	Do I expect to see interactions or relationships between my data, such as cause-effect or correlation?
Numbers/Amounts/Proportions	Am I looking for numbers, amounts, or proportions of something?

Variance or presence	Am I looking for the presence of something? Am I looking for variance?
Anecdotes or narratives	Am I looking for anecdotes or narratives about the research subject?
Changes over time	Am I looking for changes over time with certain data?
Categories	Am I looking for categories or groups to define and classify my data or research subject?

-- *How do I collect this data?*

Once you know what indicators and variables you want to study and what type of data you want, you can choose a **methodology** for collecting data. Here are some common methods:

- Database and company records
- Questionnaires and surveys
- Interviews and focus groups
- Case studies
- Experiments and field research
- Observations and demonstrations

-- *How much data do I need?*

In the era of Big Data and supercomputers, having enormous amounts of data to analyze is not as large an obstacle as in the past. Larger amounts of data mean more precision in your data analysis and results, which is desirable. However, gathering large amounts of data may not be feasible. For example, you will unlikely be able to interview every adult of voting age in Louisiana about his or her favorite brand of hot sauce. In these situations, you will need to use a **sample**—*i.e.*, a subset of the larger group that you want to study.

In deciding how large your **sample size** should be, consider the following factors:

- Time and cost
- Non-response
- Heterogeneity of the research population
- Kind of data analysis
- Desired confidence level

--*Is my sample representative of the larger group?*

A sample should be representative of the larger group so that conclusions from analyzing the sample can be generalized to the larger group. Therefore the sample should reflect the same levels and types of heterogeneity as the larger population. Perhaps the best way to achieve this representation is using **probability sampling**, which uses random selection to choose the sample. There are several types of probability sampling measures depending on the size and complexity of your research population and your study:

- Simple random sampling
- Systematic sampling
- Stratified random sample
- Multi-stage cluster sampling

You want to achieve a sample that most closely represents the larger population and thus avoids **sampling error**.

-------------------------------------- *What concepts am I exploring, based on my research questions?*

Research consists of concepts, *e.g.*, *customer satisfaction, organizational size,* or *employee training*. Your **research concepts** are based on the research question(s) and can be turned into indicators and variables.

--- *What am I going to measure?*

Indicators are measurable elements that represent the research concepts. For example, IQ is an indicator of intelligence; *i.e.*, it is a recordable measurement of the concept of intelligence. If you are doing quantitative research, you will need to turn your research concepts into measurable indicators.

-- *What are my variables?*

An indicator can be used as a variable in a quantitative study. **Variables** are the factors that vary within the research context. The factors that stay the same throughout the research context are called **constants**. You will need to identify the variables within your research context so that you can study a variable and its interactions with other variables. You may even want to neutralize the effect of one variable so that you can focus on other variables. As a result, the variables you choose to study will affect the design of your methodology. Below are four types of variables used in quantitative analysis along with examples, and Figure 1 shows how you can identify variables.

Types of Variables:	Dichotomous variables	*male/female*
	Nominal variables	*Caucasian/African American/Hispanic or Latino*
	Ordinal variables	*0-15/16-24/25-40/41-60/61-80/81 or older*
	Interval/ratio variables	*2013/2014/2015/2016*

Figure 1: Identifying the Type of Variable
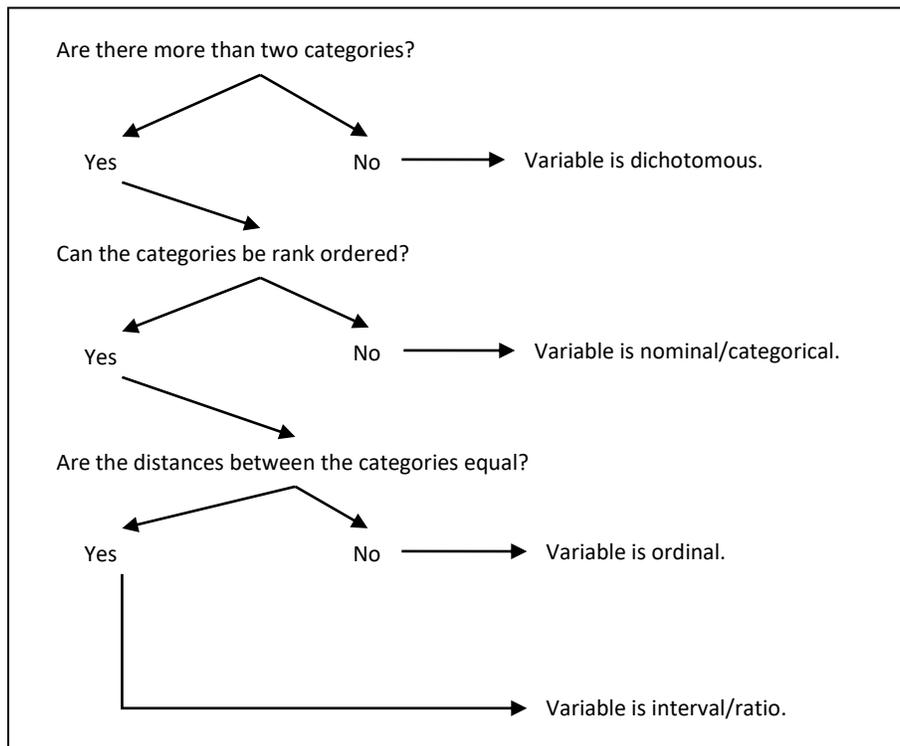
Bryman, A. and Bell, E. (2003). *Business research methods*. New York, NY: Oxford University Press, p. 240.

You will want to consider how you will analyze your data before you even begin collecting data. The method you will use to analyze data will depend on the method of data collection, the type of data collected, the sample size, and the type of desired result. The different types of data analysis methods can be most easily categorized as **quantitative** and **qualitative**.

Quantitative:	**Univariate analysis**: Analyze one variable at a time. Common approaches include frequency tables, charts and tables, mathematical averages, and ranges and standard deviations. **Bivariate analysis**: Analyze two variables together to determine a relationship. Exact methods (*e.g.*, contingency tables or Pearson's *r*) depend on the type of variables. **Multi-variate analysis**: Analyze three or more variables simultaneously to determine spuriousness between variables, presence of intervening variables, or moderation by a variable.
Qualitative:	**Grounded theory**: Starts with collecting data and explores relationships among data to develop a hypothesis; data collection and analysis continues, testing the hypothesis until a formal theory can be developed. **Analytic induction**: Starts with a hypothesis and then collects and examines data and refines the hypothesis until an explanation can be provided that accounts for all cases. **Narrative analysis**: Collects and combines narratives, allowing for diversity of voices and perspectives.

Except for narrative analysis, these business research methods involve **coding**: assigning a code to a variable or conceptual category. In quantitative analysis, coding often happens before beginning the collection of data. These codes are then used for statistical analysis of the variables, such as with the statistical program SPSS. In qualitative analysis, codes are more likely to develop as data is collected and categories appear.

Occasionally the demands of the research question may necessitate a combination of qualitative and quantitative techniques. Two examples of such a blend are quantitative analysis of qualitative data and qualitative analysis of quantitative data.

Methodology includes both a method (*i.e.*, a process) by which you will conduct your research and the **tools** that you will use to carry out the method. Therefore you need to determine what tools your data collection and analysis methods will require. For example, to collect data via a customer satisfaction survey, a fast-food company may set up a Web survey and program all cash registers to print receipts with the link to the survey; for data analysis, the company will feed the coded survey results into data analysis software. Below is a basic list of factors to consider when choosing research tools:

- Cost
- Efficiency
- Efficacy
- Availability

- Sample size
- Data needed
- Reliability
- Ease of use

You want to design your methodology to collect and measure the data accurately. To do so, the methodology must neither have **bias** nor create bias. For example, a researcher may create bias either by his or her presence

or activities in the research situation or by communicating, even inadvertently, value judgments or preferred outcomes. Skewed effects created by the researcher are often called the "Hawthorne effect."

---*Am I being objective in recording and analyzing my data?*

Objective research means giving equal weight to all pieces of data, even if the resulting conclusion opposes or contradicts your initial hypothesis or assumptions. Having a representative sample also helps to keep your research unbiased. Bias can be conscious and unconscious. Recognizing the potential for bias will help you to design a methodology that is as unbiased and objective—and *ethical*—as possible.

Writing about Methodology

In writing about your methodology, you will focus on two main facets: **description** and **support**. You will describe the various components of your methodology and then provide support for your choice. This section will explore several areas to consider or include when writing about methodology.

Audience

The level of detail that you will provide about your methodology will depend on your audience's level of knowledge and their familiarity with your field and subject. Unless you are certain that your audience already understands why you would choose a methodology (and that explanation could even insult them), do not assume that your reader will understand your choice of methodology.

Purpose

You chose your methodology because it helped you to achieve a purpose: solve a research problem. Therefore, you need to explain why your choice was the best. For example, in a product proposal, you may present results from product testing trials along with comments from trial users; the numbers provide hard data of the product's worthiness while the user comments show the appeal to the user as a person.

Design

Depending on the audience and the amount of space or time you can commit to discussing your methodology, you will want to describe and explain the various components of your methodology.

Research subject	The people, product, or process you studied, including the characteristics.
Basic assumptions	Assumptions underlying your methodological choices.
Data collection methods and tools	The processes and tools used to collect data.
Sample size	The size of the project and the amount of data collected.
Indicators and variables	The components measured or examined.
Data analysis methods and tools	The processes and tools used to analyze data.
Bias	Any potential for bias in the research design.
Strengths and limitations	The strengths and limitations of the research design, including possibilities for future research.

Organization

You should present your discussion of your methodology in a logical pattern. Below are some possible organization patterns that can be used for writing about methodology.

Sequential	Outlines the sequence of steps taken during data collection and analysis.
Categorical	Explores each component (see "Design" above) of the methodology individually.
Spatial	Examines methodology for each group within research population, each level of a process or organization, or each physical feature of a product.

Resources

Bryman, A. and Bell, E. (2003). *Business research methods*. New York, NY: Oxford University Press.

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McNamara, C. Selecting which business research method to use [Web site]. Retrieved from http://managementhelp.org/businessresearch/selecting-methods.htm.