



2. Sampling Methods

[IT2110]

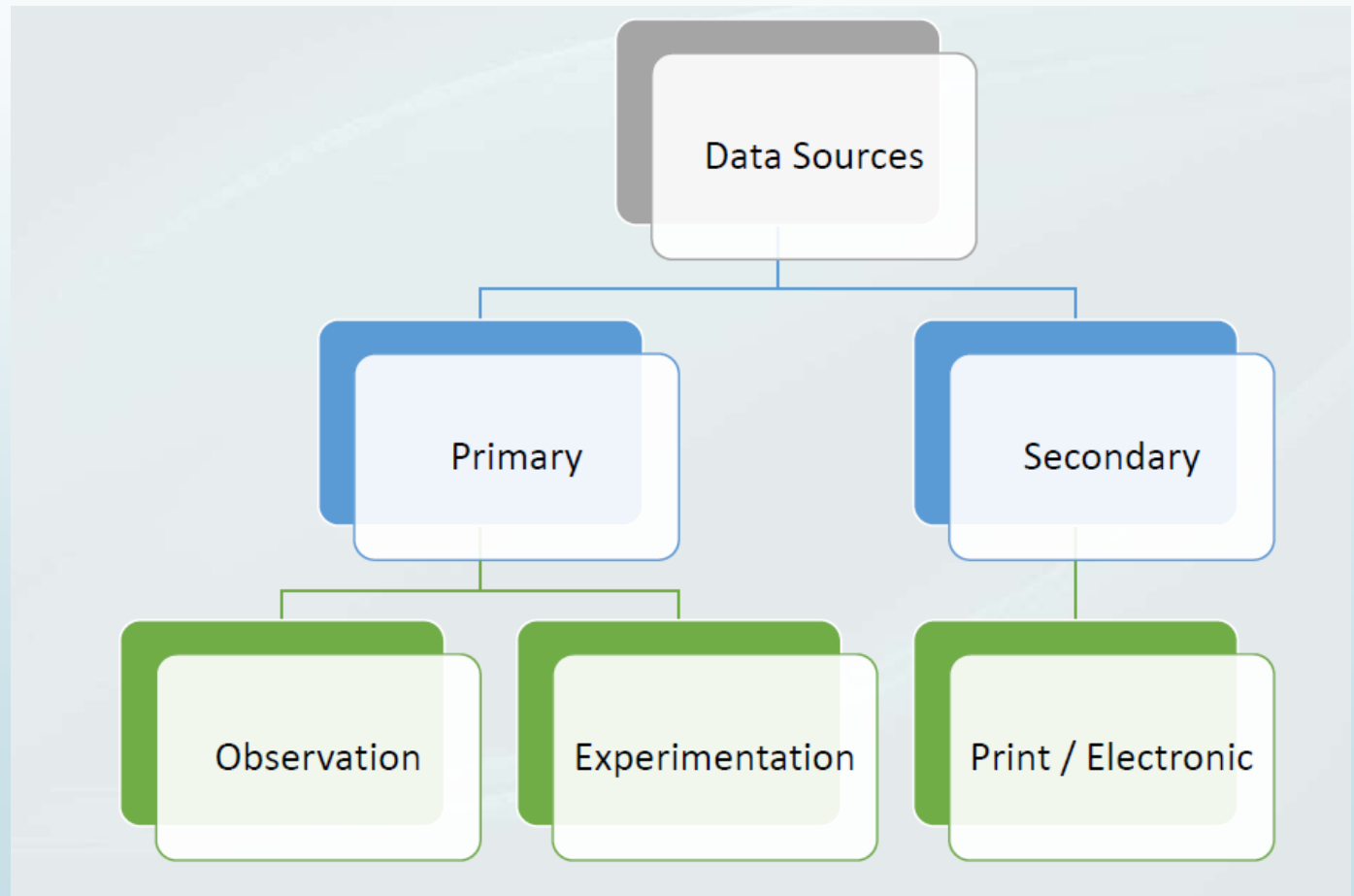
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1.

Introduction to Sampling

Data Sources



Introduction to Sampling

- ↑ Data should be collected before describing.
- ↑ If a sampling survey is done, should plan how to select the sample.
- ↑ **Two types of sampling:**
 - ← Probability sampling.
 - ← Non-probability sampling.
- ↑ Why should a proper sample be selected?

Reasons for Drawing a Sample

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- ↑ Less time consuming than a census
- ↑ Less costly to administer than a census
- ↑ Less cumbersome and more practical to administer than a census of the targeted population



2.

Non-Probability Sampling

Non-Probability Sampling

- ↑ Uses a subjective (i.e., non-random) method.
- ↑ Does not require a sampling/survey frame.
- ↑ Fast, easy and inexpensive.
- ↑ Sample might not be representative of the population.
- ↑ Chance of each element being selected (i.e., probability), cannot be calculated.
- ↑ Can be applied to studies that are used as:
 - ← an idea generating tool.
 - ← a preliminary step.
 - ← a follow-up step.



3.

Probability Sampling

Probability Sampling

A horizontal teal bar is positioned below the title. To the left of the list, there are several thin, curved lines in shades of blue and teal, creating a decorative, abstract background element.

- ↑ Based on the principle of randomization or chance.
- ↑ More complex, time consuming and usually more costly.
- ↑ More reliable.
- ↑ Requires a sampling/survey frame.
- ↑ Can use computers or other methods to select elements randomly (e.g.: random number tables).

Sampling Frame

- ↑ The list of elements from which a sample may be drawn.
- ↑ Also known as: ***working population***.
- ↑ Examples: Telephone directory, List of voters

Probability Sampling (cont'd.)



- ↑ Commonly used probability sampling methods:
 - ← Simple Random Sampling (SRS).
 - ← Systematic Sampling (SYS).
 - ← Probability-Proportional-to-Size (PPS) Sampling.
 - ← Cluster Sampling.
 - ← Stratified Sampling (STR).
 - ← Multi-Stage Sampling.
 - ← Multi-Phase Sampling.
 - ← Replicated Sampling.

Simple Random Sampling (SRS)

- ↑ Starting point for all probability sampling designs.
- ↑ Each unit in the sample has the same inclusion probability (n – Sample Size, N – Population Size).
- ↑ Sampling may be done with or without replacement (SRSWR or SRSWOR).
- ↑ Generally, SRSWOR yields more precise results and is operationally more convenient.

SRS (cont'd.)

↑ Advantages of SRS

- ← Simplest sampling technique.
- ← Requires no additional (auxiliary) information on the frame in order to draw the sample.
- ← Needs no technical development.

↑ Disadvantages of SRS

- ← Makes no use of auxiliary information even if such information exists on the survey frame.
- ← Can be expensive.
- ← It is possible to draw a 'bad' SRS sample.

Systematic Sampling (SYS)

- ↑ Units are selected from the population at regular intervals.
- ↑ A sampling interval ($k = N/n$) and a random start are required.
- ↑ Every *k*th individual thereafter.
- ↑ **Advantages**
 - ← Can result in a sample that is better dispersed than SRS.
 - ← Simpler than SRS.
- ↑ **Disadvantages**
 - ← Can result in a 'bad' sample if the sampling interval matches some periodicity in the population.

Stratified Sampling



- ↑ Divide population into two or more subgroups (called strata) according to some common characteristic.
- ↑ A simple random sample is selected from each subgroup, with sample sizes proportional to strata sizes.

Cluster Sampling

- ↑ Population is divided into several “clusters,” each representative of the population.
- ↑ A simple random sample of clusters is selected.
- ↑ All items in the selected clusters can be used, or items can be chosen from a cluster using another probability sampling technique.

Multistage Sampling

- ↑ With multistage sampling, we select a sample by using combinations of different sampling methods.
- ↑ **Example:-** In Stage 1, we might use cluster sampling to choose clusters from a population. Then, in Stage 2, we might use simple random sampling to select a subset of elements from each chosen cluster for the final sample.

PROBLEM



An auto analyst is conducting a satisfaction survey, sampling from a list of 10,000 new car buyers. The list includes 2,500 Ford buyers, 2,500 GM buyers, 2,500 Honda buyers, and 2,500 Toyota buyers. The analyst selects a sample of 400 car buyers, by randomly sampling 100 buyers of each brand.

What type of sampling method have used in this scenario?



Thank You!

Questins?
