




Determining the Sample Plan

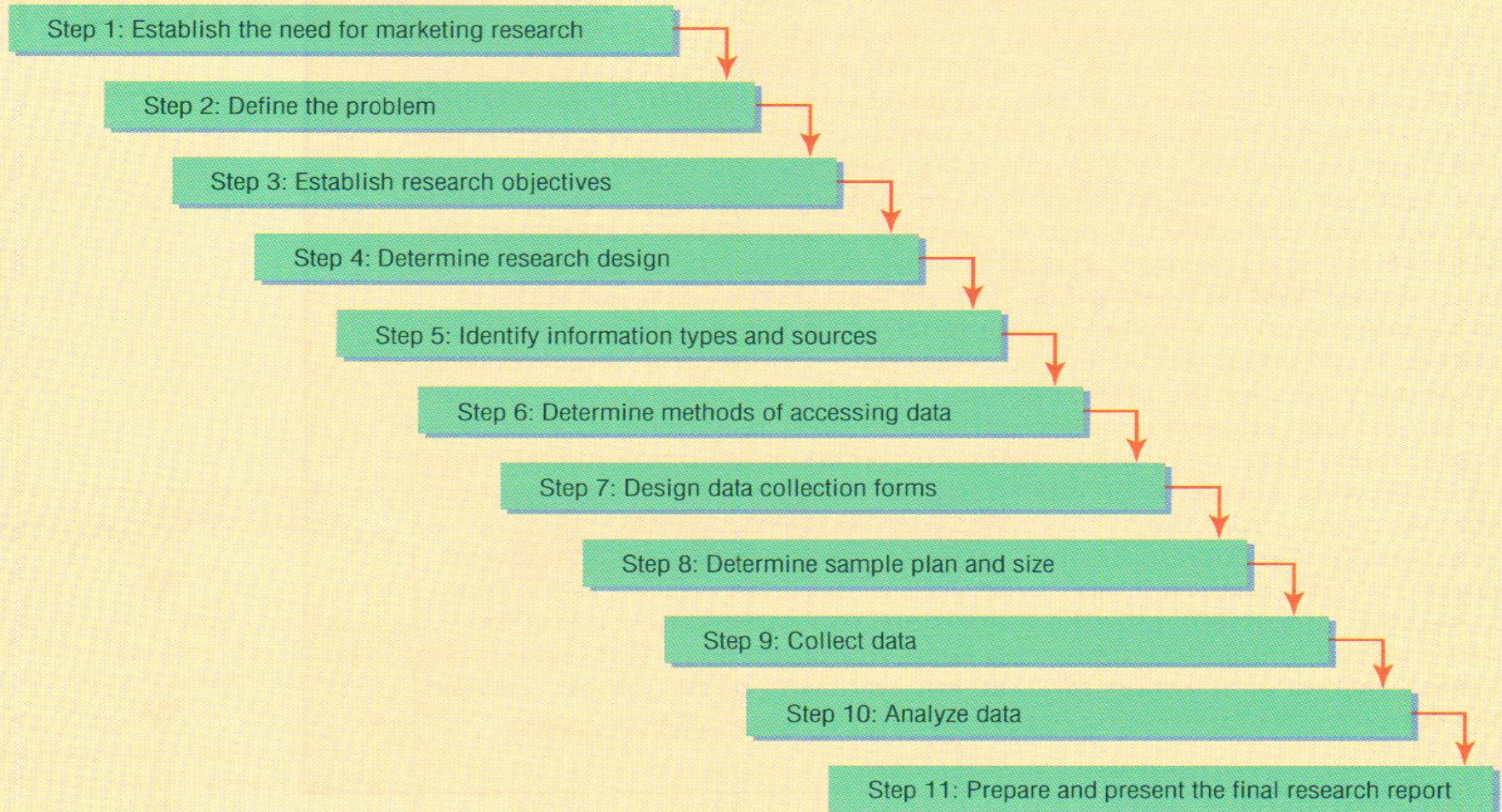
The Sample Plan is the process used to select units from the population to be used in the sample



Marketing research

Chapter 11 – Determining the sample plan – step 8

Chapter 2 The Marketing Research Process



Basic Concepts in Samples and Sampling

- **Population:** the entire group under study as defined by research objectives...

Researchers define populations in specific terms such as *“heads of households located in areas served by the company who are responsible for making the pest control decision.”*

Example for Terminix Pest Control

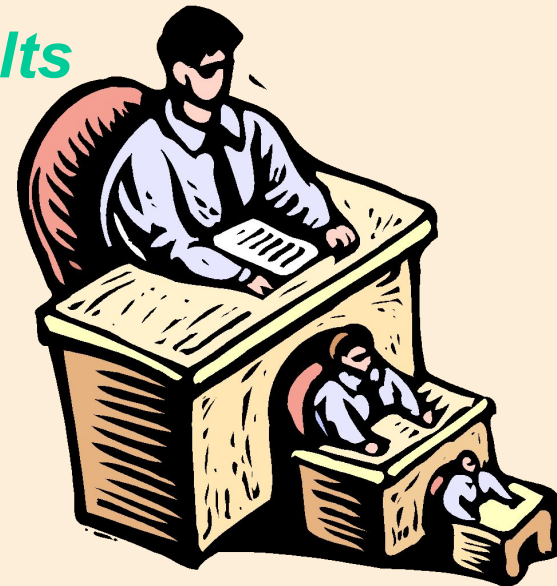
- “everybody who might use our services”
- “heads of households in those metropolitan areas served by Terminix who are responsible for inspect pest control”

Basic Concepts in Samples and Sampling

- **Sample:** a subset (подмножество) of the population that should represent the entire group
- **Sample unit:** the basic level of investigation...consumers, store managers, shelf-facings, teens, etc. The research objective should define the sample unit
- **Census:** an accounting of the complete population
- **Sampling error:** any error that occurs in a survey because a sample is used

Reasons for Taking a Sample

- *Practical considerations such as cost and population size*
- *Inability of researcher to analyze huge amounts of data generated by census*
- *Samples can produce precise results*



Two Basic Sampling Methods

- ***Probability samples:*** ones in which members of the population have a known chance (probability) of being selected into the sample
- ***Non-probability samples:*** instances in which the chances (probability) of selecting members from the population into the sample are unknown



Two Basic Sampling Methods

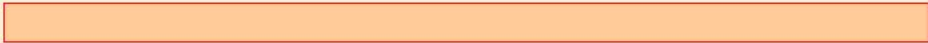
Probability

Simple Random Sampling

- **Simple random sampling:** the probability of being selected into the sample is “known” and equal for all members of the population
 - *Blind Draw Method*
 - *Random Numbers Method*
- **Advantage:**
 - Known and equal chance of selection...therefore it IS a probability sample!
 - Easy method when there is an electronic database
- **Disadvantages: (Overcome with electronic database)**
 - Complete accounting of population needed



Simple Random Sampling																											
Population	Sample Method	Resulting Sample																									
<p>The population identified uniquely by number</p> <div></div>	<p>Selection by random number</p> <div><table><tr><td></td><td></td><td></td><td></td><td></td></tr><tr><td>X</td><td></td><td></td><td>X</td><td></td></tr><tr><td></td><td>X</td><td></td><td></td><td></td></tr><tr><td></td><td></td><td>X</td><td>X</td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr></table></div>						X			X			X						X	X							<div></div> <p>Every member of the population has an equal chance of being selected into the sample</p>
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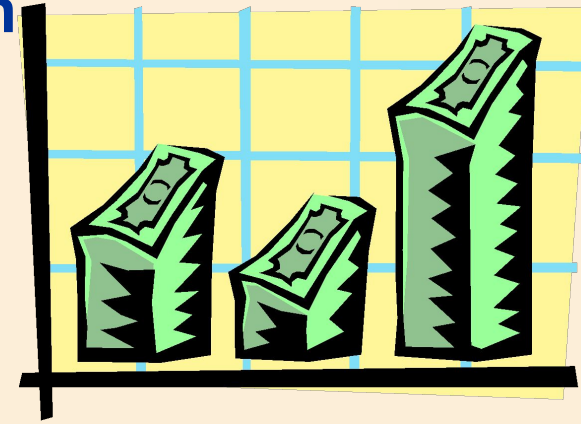


Two Basic Sampling Methods


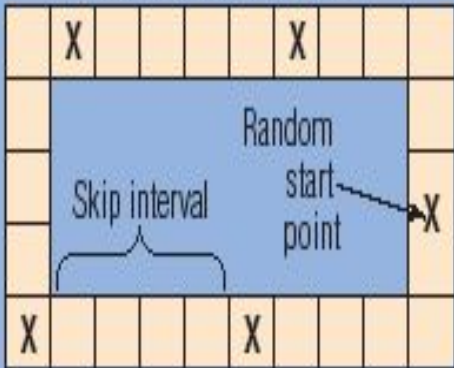

Probability

Systematic Sampling

- **Systematic sampling:** way to select a random sample from a directory or list that is much more efficient than simple random sampling
 - $\text{Skip interval} = \text{population list size} / \text{sample size}$
- **Advantages:**
 - Approximate known and equal chance of selection..it is a probability sample plan
 - Efficiency..do not need to designate every population member
- **Disadvantage:**
 - Small loss in sampling precision



Systematic Sampling

Systematic Sampling		
Population	Sample Method	Resulting Sample
<p>Directory of the population (sample frame)</p> 	<p>Selection via skip interval with a random starting point</p> 	 <p>Every member of the sample frame has an equal chance of being selected into the sample</p>

Systematic Sampling

How to Take a Systematic Sample

12.3

STEP 1: Identify a listing of the population that contains an acceptable level of sample frame error.

Example: the telephone book for your city

STEP 2: Compute the skip interval by dividing the number of names on the list by the sample size.

Example: 25,000 names in the phone book, sample size of 500, so skip interval = every 50th name

STEP 3: Using random number(s), determine a starting position for sampling the list.

Example: *Select:* random number for page number

Select: random number for the column on that page

Select: random number for name position in that column (say, Jones, William P.)

STEP 4: Apply the skip interval to determine which names on the list will be in the sample.

Example: Jones, William P. (skip 50 names)
Latham, Ferdinand B.

STEP 5: Treat the list as “circular.” That is, the first name on the list is now the initial name you selected, and the last name is now the name just prior to the initially selected one.

Example: when you come to the end of the phone book names (Zs), just continue on through the beginning (As)

Two Basic Sampling Methods

Probability

Cluster Sampling

- **Cluster sampling:** method in which the population is divided into groups (clusters), any of which can be considered a representative sample
 - *Area sampling*
- **Advantage:**
 - Economic efficiency...faster and less expensive than SRS
- **Disadvantage:**
 - Cluster specification error...the more homogeneous the clusters, the more precise the sample results



Cluster Sampling																																																																															
Population	Sample Method	Resulting Sample																																																																													
<p>The population in groups (clusters)</p> <table><tr><td>A</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>B</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>C</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>D</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>E</td><td></td><td></td><td></td><td></td><td></td></tr></table>	A						B						C						D						E						<p>Random selection of 2 clusters with random selection of members of these clusters (2-stage)</p> <table><tr><td>A</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td colspan="6">▼</td></tr><tr><td>X</td><td>x</td><td></td><td>x</td><td></td><td></td></tr><tr><td>C</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>D</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td colspan="6">▼</td></tr><tr><td>X</td><td></td><td>x</td><td></td><td>x</td><td>x</td></tr></table>	A						▼						X	x		x			C						D						▼						X		x		x	x	<table><tr><td></td><td></td><td></td><td></td><td></td></tr></table> <p>Every cluster (A, B, C, D, or E) in the population has an equal chance of being selected into the sample, and every cluster member has an equal chance of being selected from that cluster</p>					
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Cluster Sampling




In one-step cluster sample approach the researcher may believe that the various clusters are sufficiently identical to permit him to concentrate his or her attention on just one area and then generalize the results to the full population.

A two-step cluster sample approach. For the first step the researcher could select a random sample of clusters, and then for the second step, he or she could decide on a probability method to sample individuals within the chosen clusters.


A two-step area cluster sample (sampling several clusters) is preferable to a one-step (selecting only one cluster) sample unless the clusters are homogeneous



Stratified Sampling: When the researcher knows that answers to the research question are likely to vary by subgroups....



Research question: “To what extent do you value your college degree?” Answers are on a 5-point scale: 1=“Not valued at all” and 5=“Very highly valued.”

- 1. We would expect the answers to vary depending on classification. Freshman are likely to value less than seniors. We would expect the mean scores to be higher as classification goes up.**
 - 2. We would also expect there to be more agreement (less variance) as classification goes up. That is, seniors should pretty much agree that there is value. Freshman will have less agreement. See next slide...**
- 

Two Basic Sampling Methods

Probability

Stratified Sampling

- ***Stratified sampling:*** method in which the population is separated into different strata and a sample is taken from each stratum
- ***Advantage:***
 - More accurate overall sample of skewed population
- ***Disadvantage:***
 - More complex sampling plan requiring different sample sizes for each stratum



Stratified Random Sampling																																																															
Population	Sample Method	Resulting Sample																																																													
<p>The population is separated into (e.g.) two subgroups (strata)</p> <table><tr><td rowspan="3">I</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr></table> <table><tr><td rowspan="2">II</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr></table>	I																II											<p>Random selection of a proportional number of stratum members from each stratum</p> <table><tr><td rowspan="3">I</td><td></td><td></td><td></td><td>X</td><td></td></tr><tr><td></td><td>X</td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td>X</td></tr></table> <table><tr><td rowspan="2">II</td><td></td><td></td><td>X</td><td></td><td></td></tr><tr><td>X</td><td></td><td></td><td></td><td></td></tr></table>	I				X			X								X	II			X			X					<table><tr><td>I</td><td></td><td></td><td></td></tr><tr><td>II</td><td></td><td></td></tr></table> <p>Every member of each stratum (I or II) in the population has an equal chance of being selected into the sample (proportional sampling)</p>	I				II		
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Two Basic Sampling Methods

Nonprobability

- ***Convenience samples:*** samples drawn at the convenience of the interviewer
 - **Error occurs** in the form of members of the population who are infrequent or nonusers of that location
- ***Judgment samples:*** samples that require a judgment or an “educated guess” as to who should represent the population
 - **Subjectivity** enters in here, and certain members will have a smaller chance of selection than others

Two Basic Sampling Methods

Nonprobability...cont.

- ***Referral samples (snowball samples):*** samples which require respondents to provide the names of additional respondents
 - Members of the population who are less known, disliked, or whose opinions conflict with the respondent have a low probability of being selected.
- ***Quota samples:*** samples that use a specific quota of certain types of individuals to be interviewed

Online Sampling Techniques

- *Random online intercept sampling:* relies on a random selection of Web site visitors
- *Invitation online sampling:* is when potential respondents are alerted that they may fill out a questionnaire that is hosted at a specific Web site
- *Online panel sampling:* refers to consumer or other respondent panels that are set up by marketing research companies for the explicit purpose of conducting online surveys with representative samples

Developing a Sample Plan

- ***Sample plan:*** definite sequence of steps that the researcher goes through in order to draw and ultimately arrive at the final sample



Developing a Sample Plan

6 steps



- **Step 1:** Define the relevant population (target population is identified by the marketing research study objectives).
- **Step 2:** Obtain a listing of the population.
- **Step 3:** Design the sample method (size and method).



Developing a Sample Plan

6 steps...cont.

- **Step 4: Draw the sample** (the sample unit must be selected and information must be gained from that unit).
 - *Drop-down substitution*
 - *Oversampling*
- **Step 5: Assess the sample.**
 - *Sample validation assures the client, that the sample is representative.*
- **Step 6: Resample if necessary.**