Lecture 1: THE NATURE OF MARKETING RESEARCH

Marketing is a restless, changing, and dynamic business activity. The role of marketing itself has changed dramatically due to various crises—material and energy shortages, inflation, economic recessions, high unemployment, dying industries, dying companies, terrorism and war, and effects due to rapid technological changes in certain industries. Such changes, including the Internet, have forced today's marketing executive to becoming more market driven in their strategic decision-making, requiring a formalized means of acquiring accurate and timely information about customers, products and the marketplace and the overall environment. The means to help them do this is marketing research.

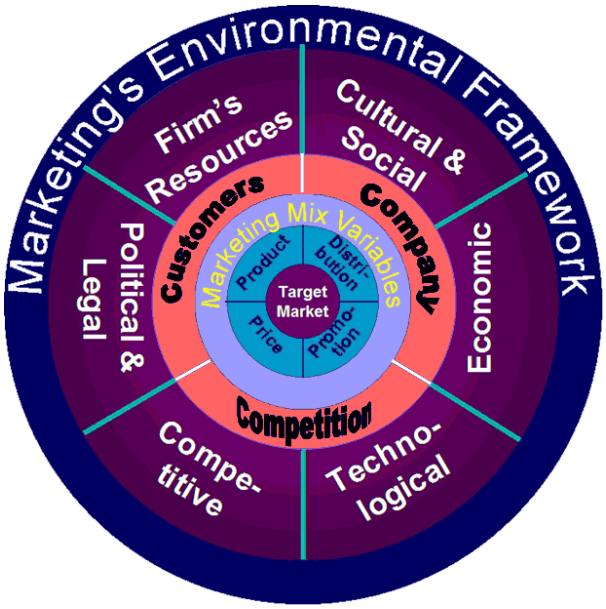
WHAT IS RESEARCH?

Research is a systematic and objective investigation of a subject or problem in order to discover relevant information or principles. It can be considered to be either primarily fundamental or applied in nature. *Fundamental research*, frequently called *basic* or *pure research*, seeks to extend the boundaries of knowledge in a given area with no necessary immediate application to existing problems, for example, the development of a research method that would be able to predict what people will be like *x* years in the future. In contrast, *applied research*, also known as *decisional research*, attempts to use existing knowledge to aid in the solution of some given problem or set of problems.

Marketing research assists in the overall management of the marketing function. A marketing manager must prioritize the more important and pressing problems selected for solution, reach the best possible solution based on the information available, implement the solution, modify the solution when additional information so dictates, and establish policy to act as a ready-made solution for any recurrence of the problem.

Marketing research often focuses on understanding the "Customer" (purchasers, consumers, influencers), the "Company" (product design, promotion, pricing, placement, service, sales), and can also be expanded toward the environment to include "Competitors" (and how their market offerings interact in the market environment).

Figure 1
Marketing Environment (Source: Modified from Perrault and McCarthy,)



Within this "Company-Customer-Competition" environment, many types of marketing research can be conducted, much of which is focused on using surveys for

- Monitoring customers and markets
- Measuring awareness, attitudes, and image
- Tracking product usage behavior
- Diagnosing immediate business problems
- Supporting strategy development

More specific examples are found in the Qualtrics.com, Survey University. This provider of professional survey software identifies twenty different kinds of surveys that are of use to marketing researchers. Each focuses on a different aspect of the "Company" and it's interaction with the "Customer" and "Competition" in the market environment:

1 - Market Description Surveys
To determine the size and relative market share of the market. Such studies provide key information about market growth, competitive positioning and tracking share of market.
2 - Market Profiling-Segmentation Surveys
To identify who the customers are, who they are not, and why they are or are not your customers. This is often a descriptive market segmentation and market share analysis
3 - Stage in the Purchase Process / Tracking Surveys
Where is the customer in the adoption process? This information shows market Awareness – Knowledge – Intention – Trial – Purchase – Repurchase of the product.
4 - Customer Intention - Purchase Analysis Surveys
Directed at understanding the current customer. What motivates the customer to move from interest in the product to actual purchase? This is key to understanding customer conversion, commitment and loyalty.
5 - Customer Attitudes and Expectations Surveys
Does the product meet customer expectations? What attitudes have customers formed about the product and/or company. Used to direct advertising and improve customer conversion, commitment and loyalty.
6 - Customer Trust - Loyalty – Retention Analysis Surveys
Especially for high priced consumer goods with long decision and purchase processes (time from need recognition to purchase), and depth of consumer attitudes formed about the product and/or company.
7 - New Product Concept Analysis Surveys
Concept test studies are appropriate in the initial screening of new product concepts. Likes and dislikes about the concept and evaluation of acceptability and likelihood of purchase are especially useful measures.
8 - New Product Acceptance and Demand Surveys (Conjoint Analysis)
Primarily for estimating demand for new products that can be described or have been developed in drawing or concept, but have not yet been developed physically. Develops develop market share estimates of market potential for the alternative potential products.
9 - Habits and Uses Surveys
Directed at understanding usage situations, including how, when and where the product is used. Habits and uses studies sometimes include a real or virtual pantry audit.
10 - Product Fulfillment Surveys (Attribute, Features, Promised Benefits)
Evaluation of the product's promised bundle of benefits (both tangible and image). Are expectations created for the product by advertising, packaging and the produce appearance fulfilled by the product?
11 - Product Positioning Surveys (Competitive Market Position)
A "Best Practices" study of "How does the market view us relative to the competition?" Competitive positioning analyses often compare the attributes and benefits that make up the product using multidimensional preference and scaling analysis.
12 - Brand Equity Analysis Surveys
What is psychological value that a brand holds in the market place? Brand equity is a composite of brand awareness, brand quality, brand associations and brand loyalty measures.
13 - Advertising Value Identification and Analysis Surveys
Advertising value analysis focuses on mapping the hierarchical attributes, benefits and values that are associated with and portrayed by an advertisement. Means-end analysis is often part of this type of study.

14 - Advertising Message Effectiveness Surveys (Media and Message)
Message effectiveness testing identifies the impressions, feelings, and effectiveness in moving the respondent to a desired goal (increased awareness, more product information, trial, repeat purchase).
15 - Sales Force Effectiveness Surveys
A combination of measures that focus on the sales activities, performance and effectiveness in producing the desired and measurable effect or goal. Often measured as a 360 degree survey completed by the sales person, the client (evaluating the sales call) and the supervisor responsible for evaluating the sales person.
16 - Sales Lead Generation Surveys
Sales lead generation surveys for (1) assuring timely use and follow-up of sales leads, (2) qualifying sales leads (thereby saving valuable sales force time) and (3) providing more effective tracking of sales leads.
17 - Customer Service Surveys
Akin to customer satisfaction surveys, but focus in detail on the actual customer service that was received, the process involved in receiving that service and the evaluation of the participants in the service process.
18 - Customer Service Representative (CSR) Surveys: Attitudes, Burnout, Turnover and Retention:
Customer Service Representatives hold attitudes that may reflect on their job related activities and interfaces including (1) the allocation of time; (2) solutions to solving customer needs; (3) information or tools to help improve their job; (4) information and best practices; (5) the evaluation of internal departments that help customers.
Customer Service Representatives must conform to corporate policies and at the same time deal with problems that are sometimes unsolvable. CSR often exhibit frustration, burnout and high turnover. Surveys focus on retention analysis and reducing costs and increasing the quality of customer relationships.
19 - Sales Forecasting and Market Tracking Surveys
Sales forecasting and market tracking studies can take a number of forms and methodologies, including expert opinion (experts estimate the market), judgmental bootstrapping (rule based decisions derived from experts that describe how to use available secondary market information), conjoint analysis (estimation of consumer intentions based on product attributes that are important in the decision), and intentions evaluations (consumer self reported intentions of future purchases) are to be made.
20 - Price Setting Surveys and Elasticity of Demand Analysis
Price surveys estimate the elasticity of demand and show optimal price points, including prices too low or too high. Price surveys may estimate the demand for different product or service segments, or different usage situations.

Source: Twenty Different Types of Surveys for "Market Analysis", Qualtrics.com Survey University.

Each of the above surveys focuses on a specific area of research and involves the development of conceptual models directed at predicting or explaining the specific behavior being measured. This level of specificity is desirable for several reasons:

1. *Clarification*. Explication usually results in the clarification of relationships and interactions. The need for more rigorous definitions of key variables often becomes apparent.

2. *Objectivity*. Often as a direct result of clarification, the process of explicating the modeled behavior often discloses rationalizations and unfounded opinions that had not been recognized as such before.

3. *Communication*. When different people hold alternative implicit models of the same problem situation, discussion may not be based on common points of reference, and communication problems arise. Explication reduces these problems.

4. *Improvement of models*. Explicit models can be tested by different persons and in differing situations to see if the results are reproducible. The degree of adaptability and range of applicability can thus be extended.

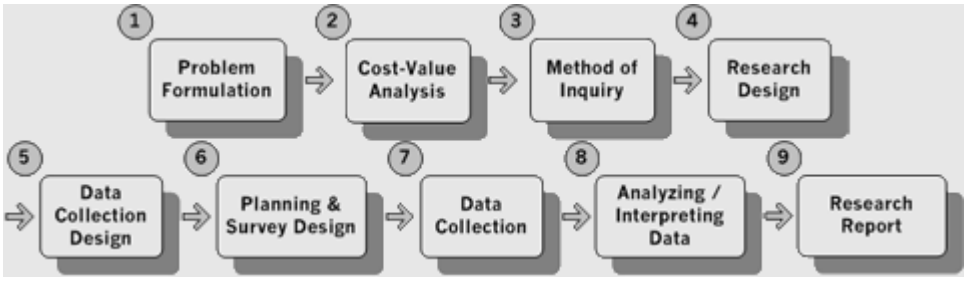
5. *Guide to research needs*. Formulating models explicitly can better pinpoint information gaps and, thus, aid in determining the nature of research needs.

Having considered these topic-situation surveys, the general process for conducting a research process will now be considered.

THE RESEARCH PROCESS

We have distinguished between basic and decisional (applied) research. This distinction is important because information is gathered and used differently. Decisional research gathers information for a pending decision; basic research gathers information to increase the level of knowledge in a given area. No matter what type of research is conducted, there are essentially four broad determinants of how a research project should be conducted: the nature of the problem, the researcher, the survey respondent or experimental subject, and the client

How is marketing research actually conducted? What are the general steps in completing a research project? These questions are answered in the steps of the research process. While the steps are shown as a linear process, some of the steps may be performed simultaneously, such as selecting data collection techniques and sample design. There are other times when "later" decisions influence decisions that are made early in the research planning process. For example, desired analysis techniques often influence the selection of data collection techniques (e.g., measurement) and sample design.



Each step in this research process will now be introduced.

STAGE 1: PROBLEM FORMULATION

In a very real sense, problem formulation is the heart of the research process. As such, it represents the single most important step to be performed. From the researcher's point of view, problem formulation means translating the management problem into a research problem.
As previously discussed, in order to formulate an appropriate research problem, the researcher must understand the origin and nature of management's problem and then be able to rephrase it into meaningful terms from an analytical point of view. This involves timely and clear communication between manager and researcher.
The end result of problem formulation is a statement of the management problem that is analytically meaningful and that often points the way to alternative solutions. An accurate problem formulation specifies the types of information needed to help solve the management problem. In short, quality thinking about a problem prior to data collection largely determines the quality of data collection, analysis and problem solving.

Examples of Management Problems and Related Research Problems

Management Problems	*Research Problems*
Allocate advertising budget among media	Estimate awareness generated by each media type
Decide whether to keep office open	Evaluate use of services on Saturday and determine on Saturday whether customers will shift usage to weekdays
Introduce a new health service	Design a concept test and assess acceptance and use
Change the marketing program	Design a test-marketing situation such that the effect of the new program can be estimated
Increase the sales of a product	Measure a product's current image

Closely related to problem formulation is the development of a working hypothesis, or an assertion about a state of nature. While hypotheses are crucial for basic research because they tell the researcher what to do,

the concept of a hypothesis can also be useful in decisional research to direct the development of the research problem statement. In most cases, the marketing researcher will not explicitly state hypotheses for the research. Kerlinger and Lee (2000, Chapter 2) suggest that research problems and hypotheses meet the following criteria:

1. The problem statement expresses a relationship between two or more variables.
2. The problem is stated clearly and unambiguously in question form.
3. The problem statement implies possibilities of empirical testing.

Where properties of good hypotheses include the following:
1. The hypothesis is a statement about the relationship between two or more variables in declarative statement form.
2. The hypothesis carries clear implications for testing the stated relationship (i.e., variables must be measurable or potentially measurable).

Source: Kerlinger and Lee, 2000, Chapter 2.

Problem Formulation Components

Problem formulation consists of specific components:

1. Specify the Research Objectives

Objectives guide the researcher in developing good, useful research, and they help the client evaluate the completed project. Objectives range from the very general, such as profit maximization, to the highly specific, such as measuring market interest in a new product. It is rare that the objectives are explained fully to the researcher. The researcher will need to take the initiative in developing a clear statement of objectives.

Each study should have a very limited and manageable set of objectives. Two or three well targeted objectives is preferable to many that are ill-conceived. Fewer the objectives make it easier to keep track of progress toward the objectives, to ensure that each is properly addressed, and to determine the best methodology. If there are too many objectives separate studies may be appropriate.

2. The Environment or Context of the Problem

Consider the problem of deciding whether to introduce a new consumer product. The marketing researcher must work closely with the client in transforming the client's problem into a workable research problem.

The researcher's efforts should be oriented toward helping the manager decide whether any investigation is justified based on the potential value of the research findings versus their cost. The researcher must be aware of, and assist in, the identification of objectives, courses of action, and environmental variables, insofar as they affect the design of the research investigation.

If the research is undertaken and if the resulting findings are to be utilized (i.e., have an influence on the user's decision making), the manager and researcher must have a productive and trusting relationship that is based on the researcher's ability to perform and deliver the research as promised.

3. The Nature of the Problem

Every research problem may be evaluated on a scale that ranges from very simple to very complex. The degree of complexity depends on the number of variables that influence the problem. Understanding the nature of the problem helps a researcher ensure that the right problem is being investigated and that a marketing plan can be developed to solve the problem. A thorough preliminary investigation using focus groups of consumers, salespeople, managers, or others close to the problem may produce much needed insight.

4. Alternative Courses of Action

A course of action specifies a behavioral sequence that occurs over time, such as the adoption of a new package design, or the introduction of a new product. Such a program of action becomes a commitment, made in the present, to follow some behavioral pattern in the future.

It is usually desirable to generate as many alternatives as possible during the problem formulation stage and state them in the form of research hypotheses to be examined. A hypothesis often implies a possible course of action with a prediction of the outcome if that course of action is followed.

Once the nature of the problem has been agreed upon, the course of action must be specified. This involves:
1. Determining which variables affect the solution to the problem
2. Determining the degree to which each variable can be controlled
3. Determining the functional relationships between the variables and which variables are critical to the solution of the problem.
The following example shows the results of a failure to follow through with these aspects of the problem situation model

EXHIBIT 2.4 "New Coke" Versus Original Coke

In the mid-1980s the Coca Cola Company made a decision to introduce a new beverage product (Hartley, 1995, pp. 129–145). The company had evidence that taste was the single most important cause of Coke's decline in the market share in the late 1970s and early 1980s. A new product dubbed "New Coke" was developed that was sweeter than the original-formula Coke.

Almost 200,000 blind product taste tests were conducted in the United States, and more than one-half of the participants favored New Coke over both the original formula and Pepsi. The new product was introduced and the original formula was withdrawn from the market. This turned out to be a big mistake! Eventually, the company reintroduced the original formula as Coke Classic and tried to market the two products. Ultimately, New Coke was withdrawn from the market.

What went wrong? Two things stand out. First, there was a flaw in the market research taste tests that were conducted: They assumed that taste was the deciding factor in consumer purchase behavior. Consumers were not told that only one product would be marketed. Thus, they were not asked whether they would give up the original formula for New Coke. Second, no one realized the symbolic value and emotional involvement people had with the original Coke. The bottom line on this is that relevant variables that would affect the problem solution were not included in the research.

5. The Consequences of Alternative Courses of Action
A set of consequences always relate to courses of action and even to the occurrence of events not under the control of the manager. One of the manager's primary jobs is to anticipate and communicate the possible outcomes of various courses of action that may result from following the research.

6. Degrees of Uncertainty
Most marketing problems are characterized by a situation of uncertainty as to which course of action is best. Years of experience may allow the decision-making manager to assign various "likelihoods of occurrence" to the various possible outcomes of specific courses of action.

A carefully formulated problem and statement of research purpose is necessary for competent research. The statement of purpose involves a translation of the decision maker's problem into a research problem and the derivation of a study design from this problem formulation. The research problem provides relevant information concerning recognized (or newly generated) alternative solutions to aid in this choice.

STAGE 2: METHOD OF INQUIRY

Market researchers look to the scientific method as the source of their investigative methods. Even though this method is not the only one used, it is the standard against which other investigative methods are measured. The scientific method makes great use of existing knowledge both as a starting point for investigation and as a check on the results of the investigations (i.e., a test of validity). Its most distinctive characteristic is its total lack of subjectivity. The scientific method has evolved objective and rigid procedures for verifying hypotheses or evaluating evidence. It is analytical in its processes and is investigator-independent. Thus, the scientific method is for the most part logical and objective, and frequently makes extensive use of mathematical reasoning and complicated experiments (see Exhibit 2.6).

The goal of a scientific methodologist, also called an objectivist, is to run a hypothesis test using publicly stated procedures that are investigator-independent.

- Formulate a problem
- Develop a hypothesis
- Make predictions based on the hypothesis
- Devise a test of the hypothesis
- Conduct the test
- Analyze the results

Even though the terminology used is that associated with basic research, the process described is analogous to that of decision making. Although the steps are the same, there are differences in the way in which the steps are performed and in the underlying assumptions about behavior. For example, the essential difference between the objectivist and the subjectivist is the latter's allowance for use of subjective judgments both when collecting data and when analyzing data (Diesing, 1966). The distinction has very practical meaning, particularly when considering the use of outside research suppliers. There are commercial research firms that tend to specialize in one or the other method of inquiry. Objectivist-based research is often called *quantitative research,* whereas subjectivist-based research is often called *qualitative research*.

The Scientific Method

In structure, if not always in application, the scientific method is simple and consists of the following steps:
1. *Observation.* This is the problem-awareness phase, which involves observing a set of significant factors that relate to the problem situation.
2. *Formulation of hypotheses.* In this stage, a hypothesis (i.e., a generalization about reality that permit prediction) is formed that postulates a connection between seemingly unrelated facts. In a sense, the hypothesis suggests an explanation of what has been observed.
3. *Prediction of the future.* After hypotheses are formulated, their logical implications are deduced. This stage uses the hypotheses to predict what will happen.
4. *Testing the hypotheses.* This is the evidence collection and evaluation stage. From a research project perspective this is the design and implementation of the main study. Conclusions are stated based on the data collected and evaluated.

A simple example will show how the scientific method works. Assume a researcher is performing a marketing research project for a manufacturer of men's shirts:
1. Observation: The researcher notices some competitors' sales are increasing and that many competitors have shifted to a new plastic wrapping.
2. Formulation of hypotheses: The researcher assumes his client's products are of similar quality and that the plastic wrapping is the sole cause of increased competitors' sales.
3. Prediction of the future: The hypothesis predicts that sales will increase if the manufacturer shifts to the new wrapping.
4. Testing the hypotheses: The client produces some shirts in the new packaging and market-tests them.

STAGE 3: RESEARCH METHOD

Whether a particular method of inquiry is appropriate for a research problem depends in large part on the nature of the problem itself and the extent or level of existing knowledge. In addition to selecting a method of inquiry, the research planner must also select a research method.

Two broad methodologies can be used to answer any research question–experimental research and non-experimental research. The major advantage of experimental research lies in the ability to control extraneous variables and manipulate one or more variables by the intervention of the investigator. In non-experimental research, there is no intervention beyond that needed for purposes of measurement.

STAGE 4: RESEARCH DESIGN

Research design is defined as the specific methods and procedures for acquiring the information needed. It is a plan or organizational framework for doing the study and collecting the data. Research designs are unique to a methodology. We discuss research design in depth later in this document and in Chapter 8.

STAGE 5: DATA COLLECTION TECHNIQUES

Research design begins to take on detailed focus as the researcher selects the particular techniques to be used in solving the problem formulated and in carrying out the method selected. A number of techniques available for collecting data can be used. Some techniques are unique to a method of inquiry. For example, many of the qualitative research techniques, such as projective techniques, are used only in subjectivist-type research. In general, data collection uses either communication or observation. Communication involves asking questions and receiving responses. This process can be done in person, by mail, by telephone, by e-mail, and over the Internet. In most instances this constitutes the broad research technique known as the survey. In contrast to this process, data may be obtained by observing present or past behavior. Regarding past behavior, data collection techniques include looking at secondary data such as company records, reviewing studies published by external sources, and examining physical traces such as erosion and accretion.

In order to collect data from communication or observation there must be a means of recording responses or behavior. Thus, the process of measurement and the development of measurement instrument are closely connected to the decision of which data collection technique(s) should be used. The relationship is two-way. That is, the structure and content of the measurement instrument can depend on the data collection technique, and measurement considerations often influence technique selection.

STAGE 6: SAMPLE DESIGN

Rarely will a marketing research project involve examining the entire population that is relevant to the problem. For the most part, practical considerations (e.g., absolute resources available, cost vs. value, etc.) dictate that one use a sample, or subset of the relevant population. In other instances the use of a sample is derived from consideration of the relevant systematic and variable errors that might arise in a project.

In designing the sample, the researcher must specify three things:

1. Where the sample is to be selected
2. The process of selection
3. The size of the sample

The sample design must be consistent with the relevant population, which is usually specified in the problem-formulation stage of the research process. This allows the data obtained from the sample to be used in making inferences about the larger population.

The process of sample selection may be done by probability or nonprobability methods. In probability sampling every element in the population has a known nonzero probability (chance) of being selected for inclusion in a study. In contrast, a nonprobability sample is one selected on the basis of the judgment of the investigator, convenience, or by some other means not involving the use of probabilities.

STAGE 7: DATA COLLECTION

Data collection begins after the previous six stages of the research process are complete. Data collection, whether by communication or observation, requires the use of data collection personnel which then raises questions regarding managing these people. Because data collection can be costly, firms often utilize outside limited-service research suppliers, particularly when the extent of in-house research activity does not warrant the cost of having permanent data collection personnel. Also, project design may require specialized data collection, which might best be obtained from an outside supplier.

The working relationship between the data collection agency (a so-called field service) and the research supplier or client is a major factor affecting the quality of fieldwork and data collection.

A study of marketing research firms found that the major barriers to the communication of information from clients to research suppliers to field service firms were insufficient information supplied by the client, the research supplier as an intermediary between client and field service firm, and lack of client interest in data collection (Segal & Newberry, 1983).

The major suggestion for improving communication is for clients to provide more information to both suppliers and field service firms. Another way to overcome communication barriers is for the field service to be consulted on such major issues as scheduling, costs, and purpose of the study. Finally, it was

suggested that two-way communication with suppliers be established or strengthened. Although this study was conducted more than 20 years ago, these are enduring problems that exist today.

STAGE 8: ANALYSIS AND INTERPRETATION

Data that are obtained and presented in the same form as originally collected are seldom useful to anyone. Data must be analyzed. The data must be edited, coded, and tabulated before performing formal analyses such as statistical tests. The types of analyses that can be properly performed depend upon the sampling procedures, measurement instruments, and data collection techniques used. Consequently, it is imperative that the techniques of analysis, associated descriptive or prescriptive recommendation types, and presentation formats be selected prior to data collection.

STAGE 9: THE RESEARCH REPORT

The culmination of the research process is the research report. It includes a clear, accurate, and honest description of everything that has been done and the results, conclusions, and— whenever possible— recommendations for courses of action. Two critical attributes of the report are that it provides all the information readers need using language they understand (completeness) and that it contains selective information chosen by the researcher (conciseness). These attributes are often in conflict with each other.

Two approaches can be taken to ensure that this conflict is not a problem. One approach involves preparing two reports: (1) a technical report that emphasizes the methods used and underlying assumptions, and presents the findings in a detailed manner; and (2) a popular report that minimizes technical details and emphasizes simplicity. The second approach is concerned with how the report is communicated. Because people vary a great deal in how they are affected by different forms of communication, the ideal reporting process should try to encompass all major forms. Thus, a written report, by itself, may be inadequate and only an invitation to inaction. There are simply a lot of people who, for various reasons, don't respond to the printed word. There are still more that, although they may respond, will often misunderstand the meaning of what is written. For these reasons, it is vitally necessary to get management to sit down with the research manager, or with the researcher and the outside research firm, in a face-to-face reporting situation.

STANDARDS FOR SURVEY RESEARCH

Survey research activities should be required to meet strict standards, and all of the following should apply (Gelb, 2001):

1. The population is properly chosen and precisely (but not too broadly or narrowly) defined.
2. The sample represents that population.
3. The data are accurately reported.
4. The data are analyzed against statistical principles.
5. The questions asked are clear and not misleading.
6. Proper interviewing procedures are followed.
7. The process ensures *objectivity;* for example, the interviewers are not aware of the purpose of the survey.

More on each of these topics will be presented in later chapters.

THE RESEARCH PLAN

It is important to carefully plan the research process and formally recognize the relationship between the stages. The researcher should write a formal plan for the project, including the background information and statement of objectives, which then becomes the master guide for implementing and controlling the research project. The components of a research plan are outlined in Exhibit 2.7.

Objectives

State the primary and secondary objectives of the study, including operational objectives and more general aims.

Problem Analysis

Present a statement of the research problems and questions and the hypothesis or hypotheses relevant to the stated problem (i.e., testable hypotheses). Show the relationship of the objectives to the problem at hand.

Research Design

The design of a research project includes four components:
1. *Research methodology*. Describe how the investigation is to be made in general terms. Justify selection of the methodology to be used.
2. *Research techniques*. Describe the methods and procedures to be used in collecting the data in some depth: Who is to be solicited, how contact is to be made, special techniques to be used, and so on are to be covered. Discuss forms to be used to collect data and, if already developed, include with the plan.

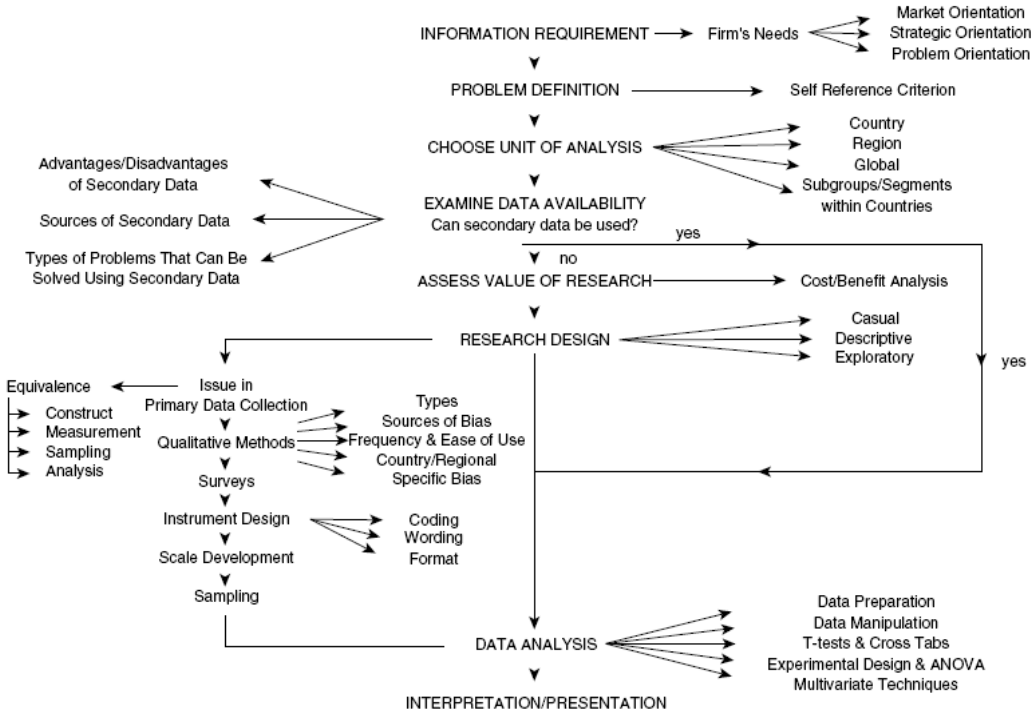


Figure 2.3 International Marketing Research Process

SOURCE: From Kumar, V., *International Marketing Research*, 1st edition, Copyright © 2000. Reprinted by permission of Pearson Education, Inc., Upper Saddle River, NJ.

3. *Sample design and selection*. State the size of the total sample and any proposed subsamples. Describe in detail the procedure to be used to ensure a representative (or other appropriate) sample of survey respondents or experimental subjects. Include any technical notes as to how the sample size was determined in an appendix.

4. *Proposed analysis*. Describe general tabulation procedures, any cross-analysis tabulations, and the reasons for such tabulations. Include discussion of proposed methods of statistical analysis together with reasons why such analyses will be used. If possible, show dummy tables with the “stubs” that will be used.

Personnel Requirements

List all personnel who will be involved with the project, the exact assignment of each person, the time to be spent, and the pay for each.

Time and Cost Requirements

Present a budget and time schedule for the major activities involved in conducting the study.

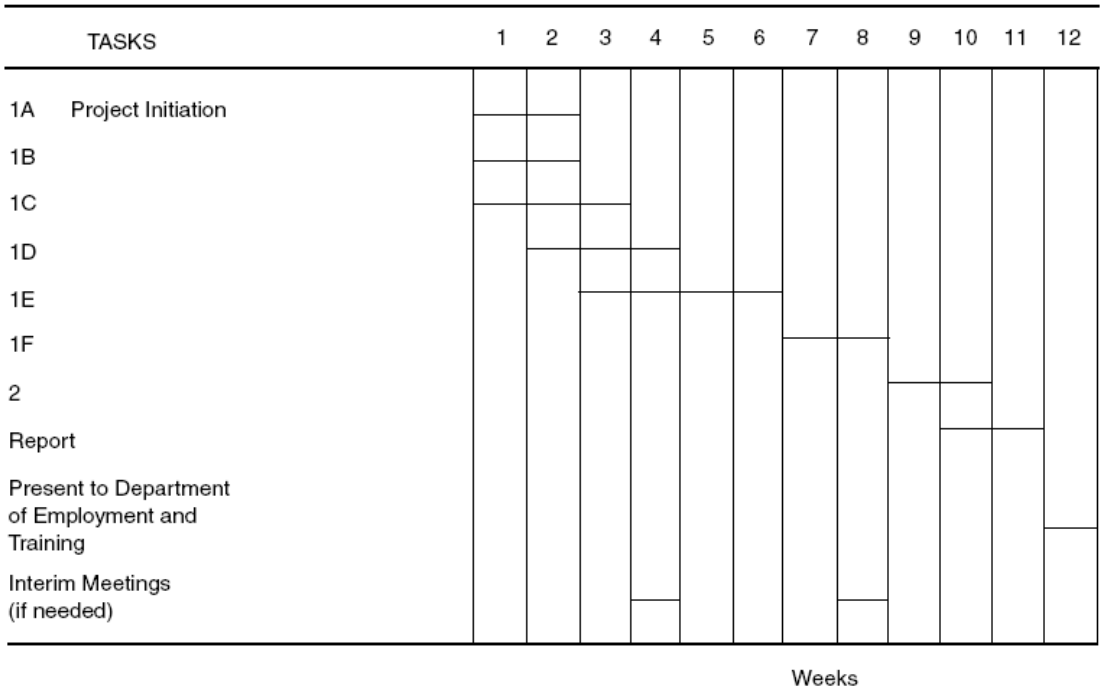


Figure 2.2 Graphic Representation of Work Plan

THE MAKE OR BUY DECISION

A decision facing all companies that want to use marketing research is who should do the research. Alternatives are to have it done in-house, to utilize outside suppliers, or some combination of the two. In short, having marketing research done is a "make or buy" decision regarding the production of marketing research information. For some companies, this decision is automatic—the in-house organization will do all research unless it is beyond their technical expertise. Other companies with in-house capabilities treat the internal units the same as outside suppliers: they must compete with outside suppliers, and prepare proposals and make bids for the business. In short, the user establishes a supplier-client relationship with all potential research suppliers. Almost all research users will at some time require the services of outside research suppliers.

These outside suppliers range from a full-service marketing research agency such as M/A/R/C Research, IMS International, and Maritz Marketing Research, Inc., to a specialized field service company that does nothing but collect data. Even full-service companies may perform only limited services, for example, research design and data collection only, if that is all the client wants. Thus, there are many variations in the way outside suppliers are used.

When might the use of an outside research supplier be appropriate? There are a number of situations that may call for the use of such firms:

1. The capabilities or technical expertise of in-house researchers are not adequate for the needed research.
2. The outside supplier has the needed facilities for doing the research, such as those needed for focus groups or laboratory experiments.
3. A research firm has developed a formula approach for handling a particular need in a specific industry. For example, a research firm in California developed a standardized survey of customer satisfaction for Toyota dealers. This survey addressed issues related to the purchase act, service, and parts.
4. There is no unused capacity in the in-house research organization.
5. There is reason to believe that in-house personnel may become emotionally or politically attached to the project, thereby losing objectivity.
6. The outside research supplier can do the research quicker.
7. The cost of the research may be reduced by having it done out-of-house. At the very least, some aspect such as data collection may be cheaper when done by an outside research supplier. Overall, purchasing data

generated by syndicated services such as supermarket-based scanner data may be less costly than attempting to collect the data from scratch.
8. There is a need for anonymity or confidentiality that may be provided best by an outside research firm.
9. The results of the research may be used in legal proceedings. If so, the outside research firm may have more credibility in the eyes of the court or regulatory or legislative body.

How to Develop a Successful Research-Consulting Relationship

Some rules of thumb for developing a quality relationship with a research client warrant consideration (proposed by Schmalensee, 2001). For the most part these represent adaptation of more standard techniques and methods to fit a B2B situation. These suggestions are organized around the typical flow of a research project:

1. *Design research to foster customer relationships.* This applies to all stages of a project. The research process should be designed to strengthen relationships with business customers.

2. *Lay the groundwork.* It is suggested that the researcher allow extra time to talk with the staff, especially those with customer contact. In B2B situations there may be many people who have customer contact, and their views may differ enough that it is beneficial to talk with as many as possible.

3. *Select and draw the samples.* There may be a choice of respondents within each business customer organization, including senior executives, contract administrators, and so-called daily interactors. In a typical project it is often difficult to decide which type of respondent to contact. One way to overcome this is to interview all major types identified as having relevant information for the problem at hand, although the questions asked each type of respondent will differ.

4. *Select the research approach and methodology.* Business respondents tend to be busy people, so it is important to be creative in selecting data collection methodologies. The use of fax, e-mail, and the Internet may lead to greater response than telephone calls or sending a questionnaire through the mail. It is helpful if the researcher knows something about how each individual respondent works, as this may be a determining factor in the selection of a data collection methodology. However, it may be unwise in a study to collect data by different means, as a potential for systematic error exists. Consequently, it is prudent to use the method that is best for the majority of the sample.

5. *Design the questions.* Because businesspeople are busy, keep the questionnaire as “short and sweet” as possible. This, of course, applies to all research projects. Business respondents will be more likely to respond if the questions are interesting and allow them to respond in their own words in a conversational way. Exhibit 2.10 addresses word meaning. This is related to the first rule; enjoyable questionnaires can be a relationship-building experience.

6. *Record and analyze the data.* Much of the information collected in B2B research is qualitative, making the analysis crucial.

7. *Report the results.* A good way to increase credibility and ensure that results lead to action is to personalize results. This includes use of individual respondent anecdotes and other humanizing details.

8. *Plan, communicate, and act.* A good way to increase response rates and build relationships with customers is to share with them what has been learned and what is planned. Communicating with customers allows a company to involve them in implementing whatever action the research suggests. This, again, is part of relationship building.

All studies must address the following basic issues (Anderson, Berdie, & Liestman, 1984):

1. *Ask the right questions.* This is the essence of project design, and the heart of proper planning. The research planner must remember that every project is unique, and as such must be tailored to the user’s needs.

2. *Ask the right people.* Sample design should be such that only those people who are of interest to the research user are contacted, and such that those who are contacted are reasonably representative of the group of interest.

3. *Ask questions the right way.* It is not enough to be able to ask the right questions; they must be asked in the right way. This is the essence of questionnaire design. The researcher can use all the aids available from the new technologies, but if the wording of the questions is not clear to the respondents, the results will be useless. One basic that is overlooked all too often is pretesting the questionnaire; this is crucial for ensuring that responses are the ones that are needed to address the problem.

4. *Obtain answers to questions.* The process of data collection is central to all marketing research. Techniques used should be selected for how each bears on nonresponse and response alike.

5. *Relate answers to the needs of the research user/client.* Data seldom speak for themselves. Proper data analysis is needed if a study is to have any value to the user. Here there is a risk of letting advanced techniques become the master of the researcher rather than the opposite. Common sense is a valuable tool for the researcher when considering alternative analysis approaches for any project.

6. *Communicate effectively.* Many good projects are ruined in this stage. The information that is reported to the user should be in a form that is understandable to the user so that he or she can tell that it is relevant to the issues at hand.

Major Ethical Considerations

There are a number of considerations that are ethical in nature that arise in conducting marketing research projects. These are summarized in Exhibit 1.6, which lists the major issues involved in three main areas of ethical interest: deceptive and fraudulent practices, invasion of privacy, and lack of consideration for research subjects and respondents.

EXHIBIT 1.6 Ethical Considerations in Treatment of Subjects and Respondents

Schneider (1977) enumerated three general areas of ethical concern: deceptive practices, invasion of privacy, and lack of consideration. Specific examples of each are listed here. Deceptive or fraudulent practices include the following:

- Unrealized promise of anonymity
- Use of disguised questionnaires and interviews
- Faked sponsor identification
- Implication of required response
- Lying about research procedure
- Faked testing in experimental research
- Promise of undelivered compensation
- Sales solicitation

The following are examples of invasions of privacy:

- Observation without informed consent
- Questions concerning people other than the subject
- Projective techniques
- Personal classification data
- Full disclosure and use of “optional” participation

All of the following practices exhibit a lack of consideration for subjects or respondents:

- Overuse of public (i.e., research placing an unreasonable demand on the time and energy of respondents)
- Research in subject areas with a depressing effect on respondents
- Subjects of no immediate interest to respondents

- Poor interviewers
- Contacts at inconvenient times
- No mention of procedural aspects
- Failure to debrief
- Failure to present subject with option to discard results upon completion

Of specific concern to many are excessive interviewing, lack of consideration for and abuse of respondents, and the use of marketing research as a sales ploy (McDaniel, Verille, & Madden, 1985).

Ethical Questions Regarding Subjects' Rights

Subjects' Rights	*Possible Results of Violation of Rights*
A. The right to choose	
1. Awareness of right	1. Feelings of forced compliance, biased data
2. Adequate information for an informed choice	2. May violate the client's desire for anonymity, may enable subjects to enact subject role
3. Opportunity to make a choice	3. Subjects may avoid environments where this right is violat
B. The right to be safe	
1. Protection of anonymity	1. Biased data, refusal to participate in future research
2. Subjects' right to be free from stress	2. Biased data, refusal to participate in future research
C. The right to be informed	
1. Debriefing	1. Unrelieved stress, feelings of being used, refusal to participate in future research
2. Dissemination of data	2. Subjects may feel that they gain nothing from and are exploited by participating in research and consequently may distort their response and decline to participate in future research
3. Right to not be deceived	3. Biased data, refusal to participate in future research

SOURCE: "Ethics in Marketing Research: Their Practical Relevance," by Tybout, A.M. & Zaltman, G., in *Journal of Marketing, 11,* p. 359. November, 1974. Published by the American Marketing Association.

Ethics in Marketing Research

The American Marketing Association, in furtherance of its central objective of the advancement of science in marketing and in recognition of its obligation to the public, has established these principles of ethical practice of marketing research for the guidance of its members. In an increasingly complex society, marketing management is more and more dependent upon marketing information intelligently and systematically obtained. The consumer is the source of much of this information. Seeking the cooperation of the consumer in the development of information, marketing management must acknowledge its obligation to protect the public from misrepresentation and exploitation under the guise of research. Similarly, the research practitioner has an obligation to the discipline and to those who provide support for it—an obligation to adhere to basic and commonly accepted standards of scientific investigation as they apply to the domain of marketing research.

FOR RESEARCH USERS, PRACTITIONERS, AND INTERVIEWERS

1. No individual or organization will undertake any activity which is directly or indirectly represented to be marketing research, but which has as its real purpose the attempted sales of merchandise or services to some or all of the respondents interviewed in the course of the research.

2. If respondents have been led to believe, directly or indirectly, that they are participating in a marketing research survey and that their anonymity will be protected, their names shall not be made known to any one outside the research organization or research department, or used for other than research purposes.

FOR RESEARCH PRACTITIONERS

1. There will be no intentional or deliberate misrepresentation of research methods or results. An adequate description of methods employed will be made available upon request to the sponsor of the research. Evidence that fieldwork has been completed according to specifications will, upon request, be made available to buyers of the research.

2. The identity of the survey sponsor and/or the ultimate client for whom a survey is being done will be held in confidence at all times, unless this identity is to be revealed as part of the research design. Research information shall be held in confidence by the research organization or department and not used for personal gain or made available to any outside party unless the client specifically authorizes such release.

3. A research organization shall not undertake marketing studies for competitive clients when such studies would jeopardize the confidential nature of client-agency relationships.

FOR USERS OF MARKETING RESEARCH

1. A user of research shall not knowingly disseminate conclusions from a given research project or service that are inconsistent with or not warranted by the data.

2. To the extent that there is involved in a research project a unique design involving techniques, approaches, or concepts not commonly available to research practitioners, the prospective user of research shall not solicit such a design from one practitioner and deliver it to another for execution without the approval of the design originator.

FOR FIELD INTERVIEWERS

1. Research assignments and materials received, as well as information obtained form respondents, shall be held in confidence by the interviewer and revealed to no one except the research organization conducting the marketing study.

2. No information gained through a marketing research activity shall be used, directly or indirectly, for the personal gain or advantage of the interviewer.

3. Interviews shall be conducted in strict accordance with specifications and instructions received.

4. An interviewer shall not carry out two or more interviewing assignments simultaneously, unless authorized by all contractors or employers concerned. Members of the American Marketing Association will be expected to conduct themselves in accordance with the provisions of this code in all of their marketing research activities.

SOURCE: The American Marketing Association.

Lecture 2: THE RESEARCH DESIGN

A research design is the specification of methods and procedures for acquiring the information needed to structure and solve problems. The overall operational design for the project stipulates what information is to be collected, from what sources, and by what procedures. A good design ensures that the information obtained is relevant to the research problem, and that it was collected by objective and economical procedures. A research design might be described as a series of advance decisions that, taken together, form a specific master plan or model for conducting the investigation.

Research designs may be classified into three types:

- Exploratory
- Descriptive
- Causal

Exploratory Studies

The major purposes of exploratory studies are the identification of problems, the precise formulation of problems (including the identification of relevant variables), and the formulation of new alternative courses of action. An exploratory study is often the first project in a series that culminates in a final project that answers research questions and produces research findings to be used as the basis of management action. That is, an exploratory study is often used as an introductory phase of a larger study, and its results are used to develop specific techniques or focus the scope of the larger study.

Despite the need for flexibility in exploratory study design, we can distinguish three separate stages that are usually included in exploratory studies and typically conducted in the sequence listed:

- A search of secondary information sources
- Interviews with persons knowledgeable about the subject area
- The examination of analogous situations

Search of Secondary Sources

Secondary sources of information are the “literature” on the subject. It is the rare research problem for which there is no relevant information to be found by a relatively quick and inexpensive search of the literature.
Secondary sources for exploratory studies are not limited to external sources. Searches should also be made of company records.

Obtaining Information from Knowledgeable Persons

Having searched secondary sources, it is usually desirable to talk with persons who are well informed in the area being investigated:

- Company executives
- Experts
- Consumers
- Users outside the organization

A widely used technique in exploratory research is the focus group. In a focus group interview, a group of knowledgeable people participates in a joint interview that does not use a structured question-and-answer methodology. The group, usually consisting of 8 to 12 people (but may have as few as 5 or as many as 20), is selected purposely to include persons who have a common background, or similar buying or use experience, relating to the problem being researched. The interviewer or moderator of the session works

with the client to develop a general discussion outline that typically includes such topics as usage experience, problems with use, and how decisions are made. The objective is to foster involvement and interaction among the group members during the interview that will lead to spontaneous discussion and the disclosure of attitudes, opinions, and information on present or prospective buying and use behavior.

Focus groups are used primarily to identify and define problems, provide background information, and generate hypotheses, rather than to provide solutions for problems. Areas of application include detecting trends in lifestyles, examining new product concepts, generating ideas for improving established products, developing creative concepts for advertising, and determining effective means of merchandising products. If the sole purpose is to create ideas, then individual interviews may be a better alternative than focus groups. Limited research on this issue conducted more than 20 years ago suggests that the number and quality of ideas generated may be greater from such interviews (Fern, 1982).

More specific uses of focus groups include identifying how people perceive a product category (e.g., frozen baked goods), detecting the language consumers use to talk about a product category (e.g., "toilet paper" rather than "bathroom tissue"), determining the wording and structure of an entire questionnaire to be used in quantitative research, and interpreting new questions that have been raised by quantitative research (Arnold, 1988). An example of the latter situation is when focus groups are used to determine the reasons for the decline in a product's overall rating, as reported in a syndicated research report. Exhibit 3.1 shows an example of an application of focus groups in exploratory research.

Examination of Analogous Situations

It is also logical that a researcher will want to examine analogous situations to determine what else can be learned about the nature of the problem and its variables. Analogous situations include case histories and simulations.

Descriptive Studies

Much research is concerned with describing market characteristics or functions. A market potential study may describe the number, distribution, and socioeconomic characteristics of potential customers of a product. A market-share study finds the share of the market received by both the company and its major competitors. A sales analysis describes sales by territory, type of account, size or model of product, and the like. Descriptive studies are also made in the following areas:

- Product research: a listing and comparison of the functional features and specifications of competitive products
- Promotion research: the demographic characteristics of the audience being reached by the current advertising program
- Distribution research: the number and location of retailers handling the company's products that are supplied by wholesalers versus those supplied by the company's distribution centers
- Pricing research: competitors' prices by geographic area

These examples of descriptive research cover only a few of the possibilities. Descriptive designs, often called observational designs by some researchers, provide information on groups and phenomena that already exist; no new groups are created (Fink, 2003).
Descriptive studies often involve determining the association between two or more variables. A two-way frequency distribution of sales revenue by membership in an organization (e.g., a cross-tabulation) is an example. A proprietary study of business involvement in a small community's Chamber of Commerce reported the data shown in Table 3.1. This type of information may be used to draw inferences concerning the relationship between the variables involved (revenue and membership). It may also be used to predict whether a new company in the area will join the Chamber of Commerce.

Although associations can be used only to infer, and not establish, a causal relationship, they are often useful for predictive purposes. It is not always necessary to understand causal relations in order to make accurate predictive statements. Descriptive information often provides a sound basis for the solution of marketing problems, even though it does not explain the nature of the relationship involved. The basic principle involved is to find desirable behavior correlates to predict that are measurable when the predictive statement is made.

Descriptive research, in contrast to exploratory research, is marked by the prior formulation of specific research questions. The investigator already knows a substantial amount about the research problem, perhaps as a result of an exploratory study, before the project is initiated, and should be able to clearly define what should be measured and how one should set up appropriate and specific means for the measurements.

One example of a descriptive study is one conducted by a school-employees credit union in order to gain information useful to provide better service to its members. Management knew very little about the members, other than that they were school employees, family members of employees, or former employees. In addition, the credit union knew very little about members' awareness and use of, and attitudes toward individual services available to them. Consequently, investigators undertook a study to answer the following research questions:

1. What are the demographic and socioeconomic characteristics of primary members?
2. How extensively are existing services being used, and what are members' attitudes toward such services?
3. What is the degree of interest in specific new services?

Causal Studies

Although descriptive information is often useful for predictive purposes, where possible we would like to know the causes of what we are predicting—the "reasons why." Further, we would like to know the relationships of these causal factors to the effects that we are predicting. If we understand the causes of the effects we want to predict, we invariably improve our ability both to predict and to control these effects.

Bases for Inferring Causal Relationships

There are three types of evidence that can be used for drawing inferences about causal relationships:

1. Associative variation
2. Sequence of events
3. Absence of other possible causal factors

In addition, the cause and effect have to be related. That is, there must be logical implication (or theoretical justification) to imply the specific causal relation.

Associative Variation

Associative variation, or "concomitant variation," as it is often termed, is a measure of the extent to which occurrences of two variables are associated. Two types of associative variation may be distinguished:
1. Association between two variables: A measure of the extent to which the presence of one variable is associated with the presence of the other
2. Association between the changes of two variables: A measure of the extent to which a change in the level of one variable is associated with a change in the level of the other It has been argued that two other conditions may also exist, particularly for continuous variables: (a) the presence of one variable is associated with a change in the level of other; and (b) a change in the level of one variable is associated with the presence of the other (Feldman, 1975).

Sequence of Events

A second characteristic of a causal relationship is the requirement that the causal factor occur first; the producer must precede the product. In order for the salesperson retraining to result in an increase in sales, the retraining must have taken place prior to the sales increase.

Absence of Other Possible Causal Factors

A final basis for inferring causation is the absence of any possible causal factors (producers) other than the one(s) being investigated. If it could be demonstrated, for example, that no other factors present could have caused the sales increase in the third quarter, we could then logically conclude that the salesperson training must have been responsible.

Obviously, in an after-the-fact examination of a situation such as the detergent sales increase, it is impossible to clearly rule out all other factors. One could never be completely sure that there were no competitor-, customer-, or company-initiated causal factors that would account for the sales increase.

Conclusions Concerning Types of Evidence

No one of the three types of evidence, or even all three types combined, can ever conclusively demonstrate that a causal relationship exists. However, we can obtain evidence that makes it highly reasonable to conclude that a particular relationship exists. Exhibit 3.3 shows certain questions that are necessary to answer.

EXHIBIT 3.3 Issues in Determining Causation

Several questions arise when determining whether a variable *X* has causal priority over another variable, *Y:*

1. What is the source of causality—does *X* cause *Y,* or does *Y* cause *X?*
2. What is the direction of causality—does *X* positively influence *Y,* or is the relationship negative?
3. Is *X* a necessary and sufficient cause—or necessary, but not sufficient cause—of *Y?* Is *X*'s causation deterministic or probabilistic?
4. Which value of the believed cause exerts a causal influence—its presence or absence?
5. Are the causes and effects the states themselves or changes in the states? Is the relationship static or dynamic?

In the end, the necessary conditions for causality to exist are a physical basis for causality, a cause that temporally precedes the effect (even for associative variation), and a logical reason to imply the specific causal relation being examined. (Monroe and Petroshius, n.d.).

SOURCES OF MARKETING INFORMATION

There are five major sources of marketing information:

- Secondary sources
- Respondents
- Natural experiments
- Controlled experiments
- Simulation

In this section we briefly describe each as an introduction to subsequent chapters that describe some of these sources in more depth.

Secondary Sources of Information

Secondary information is information that has been collected by persons or agencies for purposes other than the solution of the problem at hand. If a furniture manufacturer, for example, needs information on the potential market for furniture in the Middle Atlantic states, many secondary sources of information are available. The federal government collects and publishes information on the numbers of families, family formation, income, and the number and sales volume of retail stores, all by geographic area. It also publishes special reports on the furniture industry. Many state and local governments collect similar information for their respective areas. The trade associations in the furniture field collect and publish an extensive amount of information about the industry. Trade journals are also a valuable source of secondary information, as are special studies done by other advertising media. Private research firms collect specialized marketing information on a continuing basis and sell it to companies. These so-called syndicated services, particularly those for packaged consumer goods, are becoming more sophisticated as they are increasingly becoming based on scanner data. Technology advancements have a measurable impact on the availability of secondary data.

Information from Respondents

A second major source of information is obtained from respondents. Asking questions and observing behavior are primary means of obtaining information whenever people's actions are being investigated or predicted. The term respondent literally means "one who responds; answers." In this book it is useful to include both verbal and behavioral response in the usage of the term. That is, we shall consider both the

information obtained from asking people questions, and that provided by observing behavior (or the results of past behavior) to comprise information from respondents.

Information from Natural and Controlled Experiments

As described earlier, three types of evidence provide the bases for drawing inferences about causal relationships. Either natural or controlled experimental designs are capable of providing associative variation and sequence of events, but only controlled experiments can provide reasonably conclusive evidence concerning the third type of evidence, the absence of other possible producers.

A natural experiment is one in which the investigator intervenes only to the extent required for measurement. That is, there is no manipulation of an assumed causal variable. The investigator merely looks at what has happened. As such, the natural experiment is a form of ex post facto research. In this type of study, the researcher approaches data collection as if a controlled experimental design were used. The variable of interest has occurred in a natural setting, and the researcher looks for respondents who have been exposed to it and also, if a control group is desired, respondents who have not been exposed. Measurements can then be made on a dependent variable of interest. For example, if the impact of a television commercial on attitudes were desired, the investigator would contact a sample of people after the commercial was shown. Those who saw the commercial would constitute the experimental group, and those who did not see it would be a type of control group. Differences in attitudes could be compared as a crude measure of impact. Unfortunately, one can never be sure whether the obtained relationship is causal or noncausal, since the attitudes may be affected by the presence of other variables. For a brief discussion of natural experiments, see Anderson (1971).

In controlled experiments, investigator intervention is required beyond that needed for measurement purposes. Specifically, two kinds of intervention are required:

1. Manipulation of at least one assumed causal variable
2. Random assignment of subjects to experimental and control groups

Simulation

The expense, time involved, or other problems associated with field experimentation may preclude it as a source of information for a particular operational situation. In such cases it may be desirable to construct a model of the operational situation and to experiment with it instead of the real-world situation. The manipulation of such models is called simulation.

Simulation can be defined as a set of techniques for manipulating a model of some real-world process to find numerical solutions useful in the real process being modeled. Models that are environmentally rich (that is, that may contain complex interactions and nonlinear relationships among the variables, probabilistic components, time dependencies, etc.) are usually too difficult to solve by standard analytical methods such as calculus or other mathematical programming techniques. Rather, the analyst views a simulation model as an imitation of the process or system under study and attempts to run the system on a computer to see what would happen if a particular policy were put into effect.

Simulations may be used for research, instruction, decision-making, or some combination of these applications. During the past 30 – 40 years, simulations have been developed for such marketing decision-making applications as marketing systems, marketing-mix elements (new-product, price advertising, and sales-force decisions), and interviewing costs in marketing surveys.

TYPES OF ERRORS AFFECTING RESEARCH DESIGNS

The marketing research process (and research design) involves the management of error. Potential errors can arise at any point from problem formulation through report preparation. Rarely will a research project be error-free. Consequently, the research designer must adopt a strategy for managing this error. As we shall see in the next section of this chapter, there are alternative strategies one can follow.

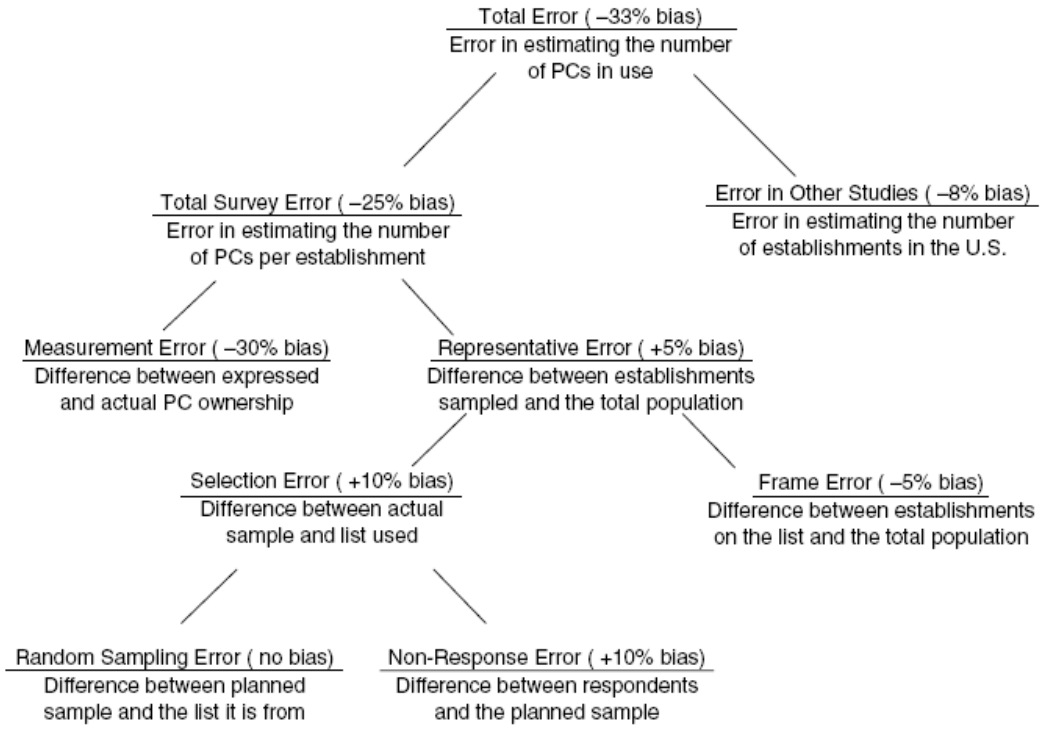
The objective underlying any research project is to provide information that is as accurate as possible. Maximizing accuracy requires that total study errors be minimized. Total study error has two components—sampling error and non-sampling error—and can be expressed as follows:

> Total error = Sampling error + Non-sampling error
> Total error is usually measured as total error variance, also known as the mean-squared error (Assael & Keon, 1982):
> $(\text{Total error})^2 = (\text{Sampling error})^2 + (\text{Non-sampling error})^2$

Sampling error refers to the variable error resulting from the chance specification of population from elements according to the sampling plan. Since this introduces random variability into the precision with which a sample statistic is calculated, it is often called random sampling error. Exhibit 3.4 gives an illustration of how total error is assessed.

EXHIBIT 3.4 How Errors Add Up

It is important to know all the sources of error that contribute to inaccuracy, and to assess the impact of each. As an example, consider the figure below, which shows components of error in a personal computer study designed to estimate the size of the market (Lilien, Brown, & Searls, 1991). When estimating the market, adjustments are made for each source of error. The components are then combined mathematically to create the total error. For purposes of simplicity, total error is shown here as the sum of the component errors. In actuality, total error would be smaller, as it is usually based on the square roots of summed squares of component errors. Assessing the individual components of total error is highly judgmental and subjective, but it is worth the effort.



SOURCE: Reprinted with permission from "How Errors Add Up," by Lilien, G., Brown, R., & Searls, K. in *Marketing News, 33,* January 7, 1991. Published by the American Marketing Association.

Non-sampling error consists of all other errors associated with a research project. Such errors are diverse in nature. It is often thought of as resulting in some sort of bias, which implies systematic error. Bias can be defined simply as the difference between the true value of that which is being measured and the average value derived from a number of independent measurements of it. However, there can be a random component of non-sampling error. For example, misrecording a response during data collection would represent a random error, whereas using a loaded question would be a systematic error. Non-sampling errors arise from nonresponse and response.

To a large extent these major error components are inversely related. Increasing the sample size to reduce sampling error can increase non-sampling error in that, for example, there are more instances where such things as recording errors can occur, and the impact of loaded (i.e., nonobjective) questions and other systematic errors will be greater. Thus, this inverse relationship lies at the heart of our concern for total error.

Ideally, efforts should be made to minimize each component. Considering time and cost limitations this can rarely be done. The researcher must make a decision that involves a tradeoff between sampling and non-sampling errors. Unfortunately, very little is known empirically about the relative size of the two error components, although there is some evidence that non-sampling error tends to be the larger of the two. In a study comparing several research designs and data collection methods, Assael and Keon (1982) concluded that non-sampling error far outweighs random sampling error in contributing to total survey error.

Exhibit 3.5 briefly defines eight major types of errors that can influence research results. Each is discussed in more detail in subsequent chapters.

EXHIBIT 3.5 Types of Errors in the Research Process

Different types of errors can influence research results:

- **Population specification:** noncorrespondence of the required population to the population selected by the researcher
- **Sampling:** noncorrespondence of the sample selected by probability means and the representative sample sought by the researcher
- **Selection:** noncorrespondence of the sample selected by nonprobability means and the sought representative sample
- **Frame:** noncorrespondence of the sought sample to the required sample
- **Nonresponse:** noncorrespondence of the achieved (or obtained) sample to the selected sample
- **Surrogate information:** noncorrespondence of the information being sought by the researcher and that required to solve the problem
- **Measurement:** noncorrespondence of the information obtained by the measurement process and the information sought by the researcher
- **Experimental:** noncorrespondence of the true (or actual) impact of, and the impact attributed to, the independent variable(s)

Population Specification Error

This type of error occurs when the researcher selects an inappropriate population or universe from which to obtain data. For example, if Cessna Aircraft wanted to learn what features should be added to a proposed corporate jet, they might conduct a survey of purchasing agents from major corporations presently owning such aircraft. However, this would be an inappropriate research universe, since pilots most likely play the key role in the purchase decision. Similarly, packaged goods manufacturers often conduct surveys of housewives, because they are easier to contact, and it is assumed they decide what is to be purchased and also do the actual purchasing. In this situation there often is population specification error, for the husband may purchase a significant share of the packaged goods, and have significant direct and indirect influence over what is bought.

Sampling Error

Sampling error occurs when a probability sampling method is used to select a sample, but this sample is not representative of the population concern. For example, a random sample of 500 people composed only of

people aged 35 to 55 would not be representative of the general adult population. Sampling error is affected by the homogeneity of the population being studied and sampled from and by the size of the sample. In general, the more homogeneous the population, the smaller the sampling error; as sample size increases, sampling error decreases. If a census were conducted (i.e., all elements of the population were included) there would be no sampling error.

Selection Error

Selection error is the sampling error for a sample selected by a nonprobability method. Consider the case of interviewers conducting a mall intercept study: There is a natural tendency for investigators to select those respondents who are the most accessible and agreeable whenever there is latitude to do so. Such samples often comprise friends and associates who bear some degree of resemblance in characteristics to those of the desired population. Selection error often reflects people who are most easily reached, better dressed, and have better kept homes or more pleasant personalities. Samples of these types rarely are representative of the desired population.

Frame Error

A sampling frame is the source for sampling that accounts for all the elements in the population. It is usually a listing of the elements, but need not be a printed list. The sample frame for a study using intercepts at a shopping mall, for instance, includes all shoppers in the mall during the period of data collection. A perfect frame identifies each population element once, but only once, and does not include elements not in the population. A commonly used frame for consumer research is the telephone directory. This frame introduces error because many elements of the population are not included in the directory (unlisted phone numbers, new arrivals), some elements are listed more than once, and nonpopulation elements are also included (businesses, people who have left the area).

Nonresponse Error

Nonresponse error can exist when an obtained sample differs from the original selected sample. There are two ways in which nonresponse can occur: (a) noncontact (the inability to contact all members of the sample); and (b) refusal (nonresponse to some or all items on the measurement instrument).
Errors arise in virtually every survey from the inability to reach respondents. In telephone surveys, some respondents are inaccessible because they are not at home (NAH) for the initial call or call-backs. Others have moved or are away from home for the period of the survey. Not-at-home respondents are typically younger with no small children, and have a much higher proportion of working wives than households with someone at home. People who have moved or are away for the survey period have a higher geographic mobility than the average of the population. Thus, most surveys can anticipate errors from non-contact of respondents.

Refusals may be by item or for the entire interview. Income, religion, sex, and politics are topics that may elicit item refusals. Some respondents refuse to participate at all because of time requirements, past experiences in which an “interviewer” turned out to be a telemarketer, their own ill health, or other reasons. A kind of refusal specific to the method is the nonresponse to a mail questionnaire. Nonresponse to mail questionnaires sometimes runs as high as 90 percent of the initial mailing, even after several successive mailings.

The amount of effort involved in data collection is another possible way to affect nonresponse error. However, little research has been done to examine the impact of effort. In a national telephone survey, a so-called five-day “standard” survey was compared to a “rigorous” survey conducted over an eight-week period (Keeter, Miller, Kohut, Groves, & Presser, 2000).

Response rates were significantly different; the rigorous survey generated about two-thirds greater response. But the two surveys produced similar results. Most of the statistically significant differences were for demographic items. Very few differences were found on substantive variables. Nonresponse is also a potential problem in business-to-business research situations.

Surveys in this type of situation, for example, are often referred to as organizational surveys. Although specific respondents are individuals, organizations are not, as they are differentiated and hierarchical. These characteristics may affect organizational response to survey requests.

Tomaskovic-Devey, Leiter, and Thompson (1994) believe the likelihood that an organizational respondent will respond is a function of three characteristics of the respondent:

1. Authority to respond: The degree to which a designated respondent has the formal or informal authority to respond to a survey request
2. Capacity to respond: Organizational practices and divisions of labor and information that affect the assembly of relevant knowledge to reply adequately
3. Motive to respond: Both individual and organizational motivations to provide information about the organization

Surrogate Information Error

In many problem situations in marketing research, it is necessary to obtain information that acts as a surrogate for that which is required. The necessity to accept substitute information arises from either the inability or unwillingness of respondents to provide the information needed.

Decision-oriented behavioral research is always concerned with the prediction of behavior, usually nonverbal behavior. This limits most marketing research projects to using proxy information. Since one cannot observe future behavior, one must use a surrogate. Typically, researchers obtain one or more kinds of information believed to be useful in predicting behavior.

One may obtain information on past behavior because it is believed that there is sufficient stability in the underlying behavior pattern to give it reasonably high predictive validity. One may ask about intended behavior as a means of prediction. Or one may obtain information about attitudes, level of knowledge, or socioeconomic characteristics of the respondent in the belief that, individually or collectively, they have a high degree of association with future behavior.

Since the type of information required is identified during the problem-formulation stage of the research process, minimizing this error requires as accurate a problem definition as possible.

Measurement Error

Measurement error is generated by the measurement process itself, and represents the difference between the information generated and the information wanted by the researcher. Such error can potentially arise at any stage of the measurement process, from the development of an instrument through the analysis of the findings. To illustrate, Figure 3.2 depicts the stages at which errors in eliciting information may arise when interviewing respondents for a survey.

In the transmittal stage, errors may be due to the faulty wording of questions or preparation of nonverbal materials, unintentional interviewer modification of the question's wording, or the way in which a respondent interprets the question. In the response phase, errors may occur because the respondent gives incorrect information, the interviewer interprets it incorrectly, or recording errors occur. One aspect of this regards form; form-related errors concern psychological orientation toward responding to different item formats and include:

1. Leniency: the tendency to rate something too high or too low
2. Central tendency: reluctance to give extreme scores
3. Proximity: giving similar responses to items that occur close to one another (Yu, Albaum, & Swenson, 2003, p. 217)

In the analysis stage, errors of incorrect editing and coding, descriptive summarization, and inference can contribute substantially to measurement error. Measurement error is particularly troublesome for the researcher, since it can arise from many different sources and take on many different forms.

Experimental Error

When an experiment is conducted, the researcher attempts to measure the impact of one or more manipulated independent variables on some dependent variable of interest, while controlling for the influence of all other (i.e., extraneous) variables. Unfortunately, control over all possible extraneous variables is rarely possible. Consequently, what may be measured is not the effect of the independent variables but the effect of the experimental situation itself.

METHODS FOR DEALING WITH POTENTIAL ERRORS

For any research project, recognizing that potential errors exist is one thing, but doing something about them is another matter. There are two basic approaches for handling potential errors:

1. Minimize errors through research design
2. Measure or estimate the error or its impact

Minimize Error

Two different approaches can be taken to minimize total error. The first uses research design to minimize errors that may result from each of the individual error components. Much of the material in Chapters 5 through 13 of this book discusses effective research methods, and as such, involves techniques designed to minimize individual errors. This is consistent with our view that research design innately involves error management. However, this approach is often limited by the budget allotted to a project.

The second approach recognizes that individual error components are not necessarily independent of each other. Thus, attempts to minimize one component may lead to an increase in another. Reducing sampling error by increasing sample size, for example, leads to potentially greater non-sampling error. This means that the research designer must trade off errors when developing a research design that minimizes total error. For a fixed project budget, therefore, it may be prudent for the research designer to choose a smaller sample size (which will increase sampling error) if the cost savings by doing this can develop techniques that will reduce nonresponse and/or improve the measurement process. If the reduction in these nonsampling errors exceeds the increase in sampling error, there will be a reduction in total error.

Estimate or Measure Error

Even though the researcher has designed a project to minimize error, it is almost never completely eliminated. Consequently, the error that exists for every project must be estimated or measured. This is recognized for sampling error when probability samples are used, though non-sampling errors typically are ignored. Although estimating or measuring errors is better than ignoring them, there may be times when ignoring non-sampling error may not be that bad. For example, if non-sampling error is viewed as a multiple of sampling error, ignoring non-sampling errors up to an amount equal to one-half of sampling error reduces a .95 confidence level only to .92 (Tull & Albaum, 1973). However, ignoring a non-sampling error equal in amount to sampling error reduces the .95 level to .83.

Estimating or measuring individual components and total error is not easy, primarily due to the nature of non-sampling errors. There is a body of accepted sampling theory that allows the researcher to estimate sampling error for a probability sample, but nothing comparable exists for non-sampling errors. Consequently, subjective or judgmental estimates must be made.

For individual error components, many diverse procedures can be used to estimate and measure their impact as illustrated in Table 3.3. These are discussed where appropriate in subsequent chapters.

Table 3.3 Selected Methods for Handling Non-Sampling Errors

Type of Error	*Design to Avoid*	*Measure*	*Estimate*
Surrogate information	Strive for realism	No method of direct measurement, as event has not yet occurred	Use track record of studies Use surrogate variables
Measurement			
1. Instrument induced	Pretest, alternative wording, alternative positions, etc.	Experiment by using alternative wording, alternative positioning, etc., in a subsample	Estimate will likely be for no bias but some variable error
2. Interviewing-associated (e.g., bias, recording, cheating)	Select and train interviewer correctly Use same editor for all of interviews by one interviewer Use cheater questions Use computer program to analyze for patterns of responses by interviewer	Re-interview subsample using expert interviewer Analysis of variance Use cheater questions Use computer program to analyze for patterns Use interpenetrating sample	Estimate will be for both bias and variable error
3. Response	Use randomized response technique Ask for verification checks Cross-check questions Use mail-back technique	Compare with known data	Have interviewer evaluate respondent Estimate will be for both bias and variable error
4. Editing	Prepare editing manual Train editors Require daily return of data	Use master editor to edit subsample	Estimate will be for limited bias, some variable error
5. Coding	Pre-code Use coding manual Use computer program to clean data	Use master coder to check subsample	Some bias and variable error
6. Tabulation	Use verification for data entry	Recheck sample of forms	Variable error
7. Analysis	No remedy except competence	Use more competent analyst	
Frame	Use multiple frames	Take subsample of excluded segments	Use compensating weights Use past data
Selection	Make sample element and sample unit the same Use probability sample	Compare with known population	Use compensating weights
Nonresponse	Use callbacks Call at appropriate time Use trained interviewers	Take subsample of nonrespondents	Use Politz-Simmons method Use wave analysis