

>chapter 4

The Research Process: An Overview

>learning objectives

After reading this chapter, you should understand. ...

1. Research is decision- and dilemma-centered.
2. The clarified research question is the result of careful exploration and analysis and sets the direction for the research project.
3. How value assessments and budgeting influence the process for proposing research and, ultimately, research design.
4. What is included in research design, data collection, data analysis, and reporting.
5. Research process problems to avoid.

Learning to ask empowering questions—especially in moments of crisis—is a critical skill that will ultimately shape the meanings you create.

Anthony Robbins, founder,
Robbins Research International, Inc.

>bringingresearchtolife MindWriter

We rejoin Henry and Associates' Jason Henry as he works on the MindWriter CompleteCare customer satisfaction project. At this stage in the MindWriter research process, Jason Henry's task is to help MindWriter's project director, Myra Wines, define the correct information to collect. Jason Henry's partner Sara Arens, Henry, and Wines have just spent the day at the CompleteCare facility in Austin and with other MindWriter managers who are influential to CompleteCare's success. They spent part of their time with Gracie Uhura, MindWriter's marketing manager.

On the return flight from Austin, Jason Henry and MindWriter's Myra Wines are discussing their trip. "It went really well," she says.

"There are going to be a few problems," disagrees Jason.

Gracie wants the sun, the sky, and the moon. She, like most managers, wants to know the demographic characteristics of her users . . . their job descriptions . . . their salaries . . . their ethnicities . . . their education. She wants to know the perception of MindWriter, wants to know their satisfaction with the purchase channel and with CompleteCare service, too."

"And your point is?" asks Myra.

"You and Gracie need to keep your eye on the bottom line. You can bet someone will want to know how you and Gracie can justify asking all these questions. They will ask, 'What is going to be the payoff in knowing the ethnicity of customers?' And if you or Gracie can't explain the justification for needing the information, if one of you can't establish that the dollar benefit of knowing is at least as great as the dollar cost of finding out, the question will get struck from the developing research."

"Is there no way we can justify knowing everything Gracie wants to know?" inquires Myra.

"We can do a pilot study by survey of a few hundred customers and see if the ethnic background, or the salary level, or any other item that Gracie cares about is a good indicator of satisfaction, willingness to make a repeat purchase, postpurchase service satisfaction, and so forth. If it is, maybe more extensive measurement can be justified."

"So you feel we need to propose an exploratory study to whittle down the information to critical items, followed by a larger study."

"A pilot study could help in other ways, too. Gracie wants to know the customers' perceptions of MindWriter's overall quality. But we have to ask ourselves, 'Are these customers really qualified to form independent opinions, or will they simply be parroting what they have read in the computer magazines or what a dealer told them?' A pilot study of a few hundred users can help determine if it is really useful to ask them their overall impression of the product."

"However, with the repair problem, we can be reasonably sure that CompleteCare customers know their own minds when it comes to evaluating their firsthand experience with MindWriter's service department."

"Today's tour of the CompleteCare facility really helped me understand the context of management's concern," comments Myra. "Did you or Sara have a chance to look over any of the customer letters from the service department?"

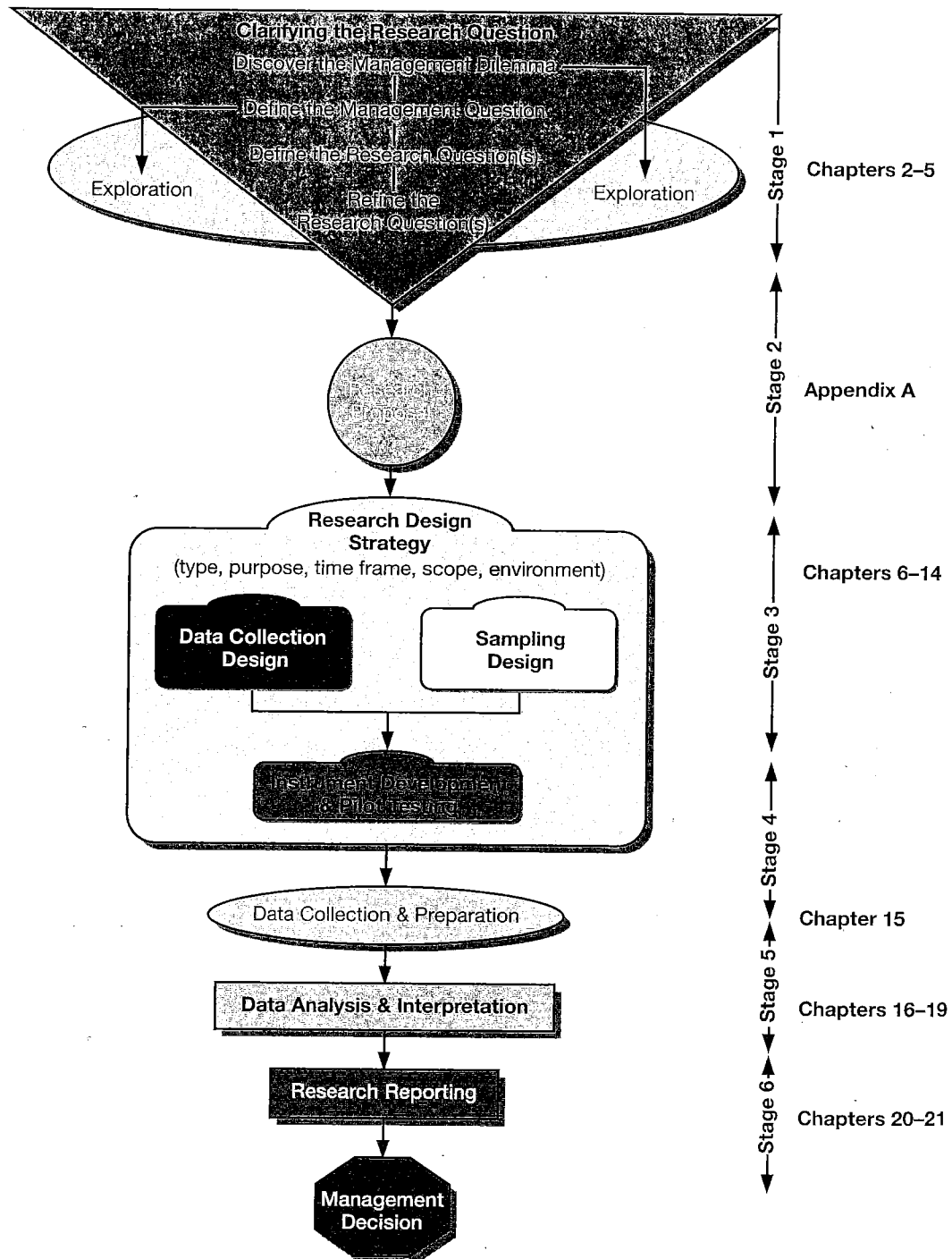
Jason digs into his briefcase and extracts a small sheaf of photocopies. "Yes, and Sara had reviewed transcriptions, too, on service center phone conversations. She pulled a few for us. One person writes, 'My MindWriter was badly damaged on arrival. I could not believe its condition when I unpacked it.' And there, 'The service technicians seemed to be unable to understand my complaint, but once they understood it, they performed immediate repairs.' You and I will collaborate to boil down these, and possibly dozens more like them, to a couple of representative questions that can be pilot-tested for clarity, consistency, and representativeness. You don't want MindWriter to pay for everything Gracie says she wants, just what she wants that has a payoff and is researchable."

> The Research Process

Writers usually treat the research task as a sequential process involving several clearly defined steps. No one claims that research requires completion of each step before going to the next. Recycling, circumventing, and skipping occur. Some steps are begun out of sequence, some are carried out simultaneously, and some may be omitted. Despite these variations, the idea of a sequence is useful for developing a project and for keeping the project orderly as it unfolds.

Exhibit 4-1 models the sequence of the **research process**. We refer to it often as we discuss each step in subsequent chapters. Our discussion of the questions that guide project planning and data gathering

>Exhibit 4-1 The Research Process



is incorporated into the model (see the elements within the pyramid in Exhibit 4-1). Exhibit 4-1 also organizes this chapter and introduces the remainder of the book.

The research process begins much as the vignette suggests. A management dilemma triggers the need for a decision. For MindWriter, a growing number of complaints about postpurchase service started the process. In other situations, a controversy arises, a major commitment of resources is called for, or conditions in the environment signal the need for a decision. For MindWriter, the critical event could have been the introduction by a competitor of new technology that would revolutionize the processing speed of laptops. Such events cause managers to reconsider their purposes or objectives, define a problem for solution, or develop strategies for solutions they have identified.

In our view of the research process, the management question—its origin, selection, statement, exploration, and refinement—is the critical activity in the sequence. Throughout the chapter we emphasize problem-related steps. A familiar quotation from Albert Einstein, no less apt today than when it was written, supports this view:

The formulation of a problem is far more often essential than its solution, which may be merely a matter of mathematical or experimental skill. To raise new questions, new possibilities, to regard old problems from a new angle requires creative imagination and marks real advance in science.¹

Whether the researcher is involved in basic or applied research, a thorough understanding of the management question is fundamental to success in the research enterprise.

> Stage 1: Clarifying the Research Question

A useful way to approach the research process is to state the basic dilemma that prompts the research and then try to develop other questions by progressively breaking down the original question into more specific ones. You can think of the outcome of this process as the **management–research question hierarchy**. Exhibit 4-2 follows the MindWriter example through the process:

The process begins at the most general level with the **management dilemma**. This is usually a symptom of an actual problem, such as:

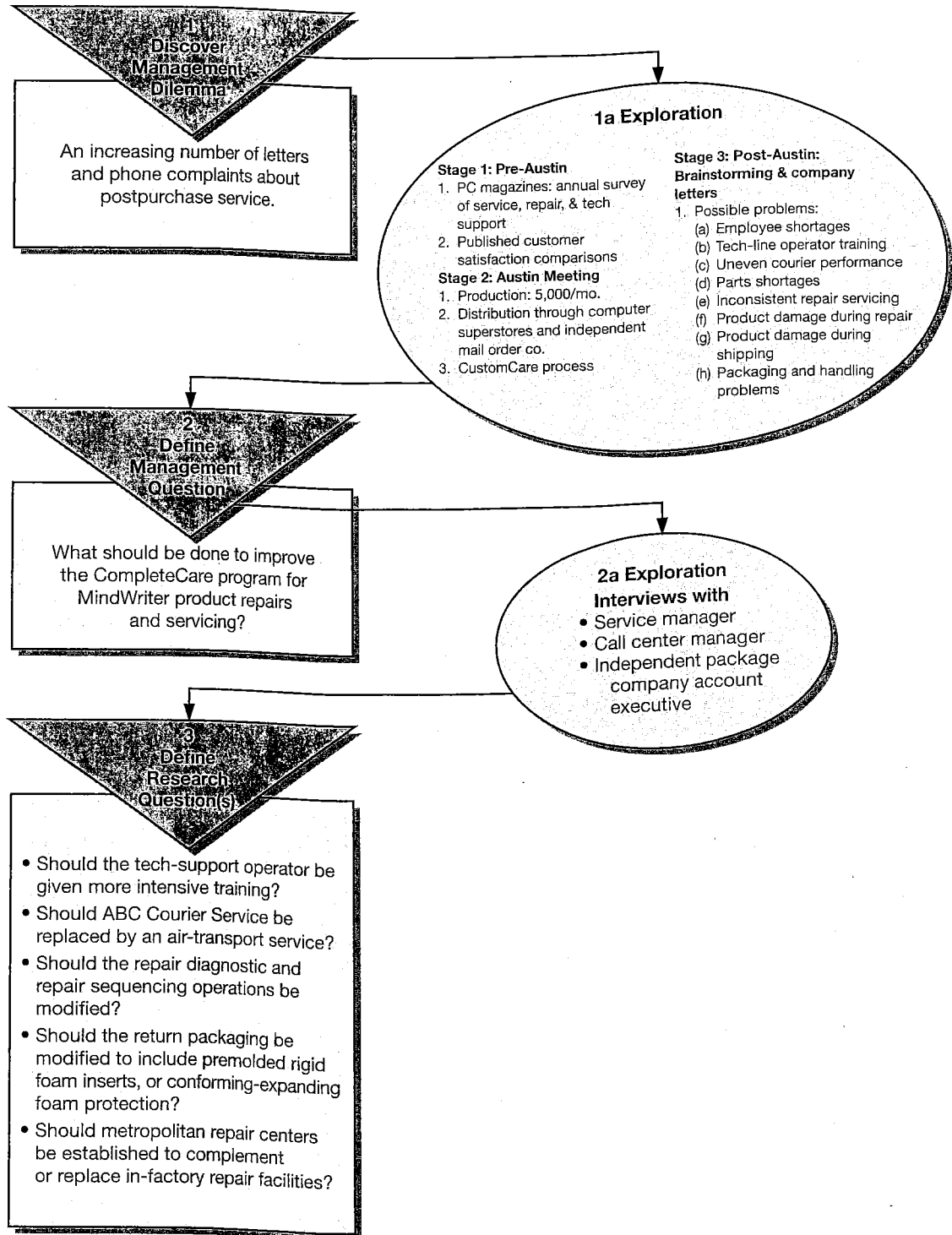
- Rising costs.
- The discovery of an expensive chemical compound that would increase the efficacy of a drug.
- Increasing tenant move-outs from an apartment complex.
- Declining sales.
- Increasing employee turnover in a restaurant.
- A larger number of product defects during the manufacture of an automobile.
- An increasing number of letters and phone complaints about postpurchase service (as in MindWriter; see Exhibit 4-2).

The management dilemma can also be triggered by an early signal of an opportunity or growing evidence that a fad may be gaining staying power—like the growing interest in hybrid cars—indicated by the number of broadcast news segments and print stories over an extended period of time.

Identifying management dilemmas is rarely difficult (unless the organization fails to track its performance factors—like sales, profits, employee turnover, manufacturing output and defects, on-time deliveries, customer satisfaction, etc.). However, choosing one dilemma on which to focus may be difficult. Choosing incorrectly will direct valuable resources (time, manpower, money, and equipment) on a path that may not provide critical decision-making information (the purpose of good research). As a manager, only practice makes you proficient. For new managers, or established managers facing new responsibilities, developing several management–research question hierarchies, each starting with a different dilemma, will assist in the choice process. In all figures related to the research process model, in this and subsequent chapters, we use an inverted pyramid to represent the management–research question hierarchy.

>Exhibit 4-2 Formulating the Research Question for MindWriter

To move from the management dilemma to the management question and subsequent research questions takes exploratory research. Such research may include examining previous studies, reviewing published studies and organizational records, and interviewing experts or information gatekeepers.



>snapshot

Should Companies Hire Teens?

According to the U.S. Bureau of Labor Statistics, 32.6 percent of teens nationwide worked during the summer of 2008, another year of decreased participation in the labor force. With the economy in recession, it's no wonder that teen employment is down along with overall employment.

For the summer of 2008, according to the Bureau of Labor Statistics, teens had an unemployment rate of 23.6 percent, an increase of more than 9 percent from just two years ago and almost three times the unemployment rate for adults. Economists think that teen unemployment may be significantly understated by the number of teens who felt locked out of the job market and did not actively seek employment.

Let's assume you are a manager of an organization that is questioning whether it should hire teen workers. A study sponsored by The Conference Board, Partnership for 21st Century Skills, Society for Human Resource Management, and Corporate Voices for Working Families, "Are They Really Ready to Work?" reports the opinions of more than 400 U.S. executives and human resource professions. Their unfavorable opinion was that "far too many young people are inadequately prepared to be successful in the workplace." Assessing teens with a Workforce Readiness Report Card, "10 skills that a majority of employer respondents rate as 'very important' to workforce success are on the Deficiency List." The report further defines the problem of teen workplace skills: "At the high school level, well over one-half of new entrants are deficiently prepared in the most important skills—Oral and Written Communications, Professionalism/Work Ethic, and Critical Thinking/Problem Solving."

You remember how important work was in building self-confidence and independence, so you don't want to write off all teens, but you are also concerned that supporting a "hire



teens" initiative might be counter-productive to your own job advancement if the study proves to be true. What research could you do to help formulate your recommendation on whether your organization should or should not hire teen workers?

www.bls.gov

Subsequent stages of the hierarchy take the manager and his or her research collaborator through various brainstorming and exploratory research exercises to define the following:

- **Management question**—a restatement of the manager's dilemma(s) in question form.
- **Research questions**—the hypothesis that best states the objective of the research; the question(s) that focuses the researcher's attention.
- **Investigative questions**—questions the researcher must answer to satisfactorily answer the research question; what the manager feels he or she needs to know to arrive at a conclusion about the management dilemma.
- **Measurement questions**—What participants in research are asked or what specifically is observed in a research study.

The definition of the management question sets the research task. A poorly defined management question will misdirect research efforts. In Chapter 5 we explore this critical stage in more detail in our search to clarify the research question.

Covering Kids: The Management-Research Question Hierarchy

Robert Wood Johnson Foundation (RWJF), a health care philanthropy, sponsors the Covering Kids initiative for one reason: Millions of children in low- to moderate-income families who are eligible for the State Children's Health Insurance Program (SCHIP) are not enrolled. RWJF initially became involved because it was concerned that the federal government and the states were not actively or effectively publicizing Medicaid and SCHIP. The initial goal of RWJF's involvement was to make eligible families aware of SCHIP and Medicaid and encourage enrollment. To this end, RWJF obtained the services of advertising agency GMMB, research firm Wirthlin Worldwide, and veteran social marketer Elaine Bratic Arkin.

The Foundation initially asked, "What must be done to enroll the largest percentage of eligible children in Medicaid and SCHIP?" Before GMMB could move forward, the team needed to determine whether the communication program needed to correct misconceptions, communicate benefits, overcome perceived process complexities, or do some combination of these. Early exploratory research sought answers to "What keeps eligible families from taking advantage of the prescription and doctor-visit programs of SCHIP and Medicaid?" The team also asked, "Is a negative stigma attached to participation in government health care programs?" When research indicated the answer to this question was "No," subsequent efforts focused on identifying other critical factors that discouraged families from enrolling. After research revealed that most working parents did not realize their children were eligible for a government program, the management question was refined to "What must be communicated to parents of eligible children to get them to enroll their children in these programs?"

Ultimately a creative combination of research design and data analysis revealed: (1) the winning communications framework:

LOW-COST & FREE HEALTH CARE COVERAGE MANY WORKING FAMILIES ARE NOW ELIGIBLE!

You work hard to take care of your kids...

Now there's help.

YOUR CHILD CAN BE COVERED FOR:

- DOCTOR VISITS
- HOSPITALIZATION
- PRESCRIPTIONS
- OTHER BENEFITS

Make sure your kids are covered to get the care they need to stay well... and protect your family budget.

Ask about the low-cost or free health care coverage programs in your state.

CALL 1(877) KIDS-NOW TOLL-FREE

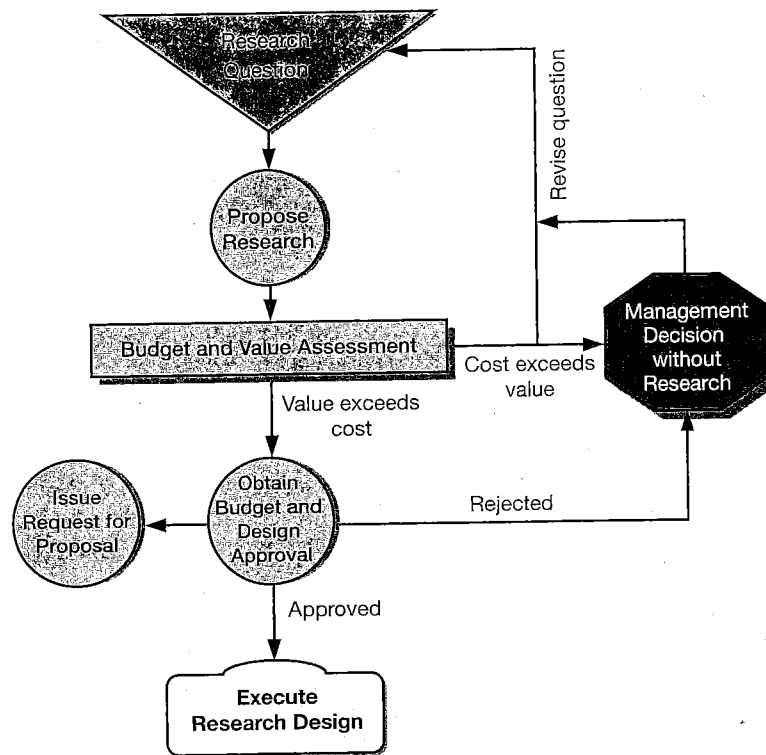
Being a good parent means raising happy, healthy children, and enrolling a program offering low-cost or free health care is a smart choice for families, and (2) every communication must give working parents an easy, foolproof way to determine if their children are eligible while reinforcing the logic that making the call to enroll their children would address parents' innate desire to be good parents.

www.wirthlin.com; www.gmmmb.com; www.rwjf.org

> Stage 2: Proposing Research Resource Allocation and Budgets

General notions about research budgets have a tendency to single out data collection as the most costly activity. Data collection requires substantial resources but perhaps less of the budget than clients expect. Employees must be paid, training and travel must be provided, and other expenses incurred must be paid; but this phase of the project often takes no more than one-third of the total research budget. The geographic scope and the number of observations required do affect the cost, but much of the cost is relatively independent of the size of the data-gathering effort. Thus, a guide might be that (1) project planning; (2) data gathering; and (3) analysis, interpretation, and reporting each shares about equally in the budget.

Exhibit 4-3 Proposing Research



Without budgetary approval, many research efforts are terminated for lack of resources (see Exhibit 4-3). A budget may require significant development and documentation as in grant and contract research, or it may require less attention as in some in-house projects or investigations funded out of the researcher's own resources. The researcher who seeks funding must be able not only to persuasively justify the costs of the project but also to identify the sources and methods of funding. One author identifies three types of budgets in organizations where research is purchased and cost containment is crucial:

- *Rule-of-thumb budgeting* involves taking a fixed percentage of some criterion. For example, a percentage of the prior year's sales revenues may be the basis for determining the marketing research budget for a manufacturer.
- *Departmental or functional area budgeting* allocates a portion of total expenditures in the unit to research activities. Government agencies, not-for-profits, and the private sector alike will frequently manage research activities out of functional budgets. Units such as human resources, marketing, or engineering then have the authority to approve their own projects.
- *Task budgeting* selects specific research projects to support on an ad hoc basis. This type is the least proactive but does permit definitive cost-benefit analysis.²

Valuing Research Information

There is a great deal of interplay between budgeting and value assessment in any management decision to conduct research. An appropriate research study should help managers avoid losses and increase sales or profits; otherwise, research can be wasteful. The decision maker wants a firm cost estimate for a project and an equally precise assurance that useful information will result from the study. Even if the researcher can give good cost and information estimates, the managers still must judge whether the benefits outweigh the costs.

Conceptually, the value of applied research is not difficult to determine. In a business situation, the research should produce added revenues or reduce expenses in much the same way as any other investment of resources. One source suggests that the value of research information may be judged in terms of "the difference between the result of decisions made with the information and the result that would be made without it."³ While such a criterion is simple to state, its actual application presents difficult measurement problems.

Evaluation Methods

Ex Post Facto Evaluation If there is any measurement of the value of research, it is usually an after-the-fact event. Twedt reports on one such effort, an evaluation of marketing research done at a major corporation.⁴ He secured "an objective estimate of the contribution of each project to corporate profitability." He reports that most studies were intended to help management determine which one of two (or more) alternatives was preferable. He guesses that in 60 percent of the decision situations, the correct decision would have been made *without* the benefit of the research information. In the remaining 40 percent of the cases, the research led to the correct decision. Using these data, he estimates that the return on investment in marketing research in this company was 3.5 times for the year studied. However, he acknowledges the return-on-investment figure was inflated because only the direct research costs were included.

This effort at cost-benefit analysis is commendable even though the results come too late to guide a current research decision. Such analysis may sharpen the manager's ability to make judgments about future research proposals. However, the critical problem remains, that of project evaluation *before* the study is done.

Prior or Interim Evaluation A proposal to conduct a thorough management audit of operations in a company may be a worthy one, but neither its costs nor its benefits are easily estimated in advance. Such projects are sufficiently unique that managerial experience seldom provides much aid in evaluating such a proposal. But even in these situations, managers can make some useful judgments. They may determine that a management audit is needed because the company is in dire straits and management does not understand the scope of its problems. The management information need may be so great as to ensure that the research is approved. In such cases, managers may decide to control the research expenditure risk by doing a study in stages. They can then review costs and benefits at the end of each stage and give or withhold further authorization.

Option Analysis Some progress has been made in the development of methods for assessing the value of research when management has a choice between well-defined options. Managers can conduct a formal analysis with each alternative judged in terms of estimated costs and associated benefits and with managerial judgment playing a major role.

If the research design can be stated clearly, one can estimate an approximate cost. The critical task is to quantify the benefits from the research. At best, estimates of benefits are crude and largely reflect an orderly way to estimate outcomes under uncertain conditions. To illustrate how the contribution of research is evaluated in such a decision situation, we must digress briefly into the rudiments of decision theory.

Decision Theory When there are alternatives from which to choose, a rational way to approach the decision is to try to assess the outcomes of each action. The case of two choices will be discussed here, although the same approach can be used with more than two choices.

Two possible actions (A_1 and A_2) may represent two different ways to organize a company, provide financing, produce a product, and so forth. The manager chooses the action that affords the best outcome—the action choice that meets or exceeds whatever criteria are established for judging alternatives. Each criterion is a combination of a **decision rule** and a **decision variable**. The decision variable might be "direct dollar savings," "contribution to overhead and profits," "time required for completion of the project," and so forth. For MindWriter, the decision variable might be number of postservice complaints or the level of postservice satisfaction. Usually the decision variable is

Expressed in dollars, representing sales, costs, some form of profits or contribution, or some other quantifiable measure. The decision rule may be "choose the course of action with the lowest loss possibility" or perhaps "choose the alternative that provides the greatest annual net profit." For MindWriter, the decision rule might be "choose the alternative that provides the highest level of postservice satisfaction."

The alternative selected (A_1 versus A_2) depends on the decision variable chosen and the decision rule used. The evaluation of alternatives requires that (1) each alternative is explicitly stated, (2) a decision variable is defined by an outcome that may be measured, and (3) a decision rule is determined by which outcomes may be compared.

The Research Proposal

Exhibit 4-1 depicts the research proposal as an activity that incorporates decisions made during early project planning phases of the study, including the management–research question hierarchy and exploration. The proposal thus incorporates the choices the investigator makes in the preliminary steps, as depicted in Exhibit 4-3.

A written proposal is often required when a study is being suggested. This is especially true if an outside research supplier will be contracted to conduct the research. The written proposal ensures that the parties concur on the project's purpose, the proposed methods of investigation, the extent of analysis, and the timing of each phase as well as of delivery of results. Budgets are spelled out, as are other responsibilities and obligations. The proposal may serve the purpose of a legally binding contract.

A research proposal also may be oral, wherein all aspects of the research are discussed but not codified in writing. This is more likely when a manager directs his or her own research or the research activities of subordinates. We describe detailed research proposals in Appendix A, and you will find a sample proposal on the text website.

> Stage 3: Designing the Research Project Research Design

The **research design** is the blueprint for fulfilling objectives and answering questions. Selecting a design may be complicated by the availability of a large variety of methods, techniques, procedures, protocols, and sampling plans. For example, you may decide on a secondary data study, case study, survey, experiment, or simulation. If a survey is selected, should it be administered by mail, computer, telephone, the Internet, or personal interview? Should all relevant data be collected at one time or at regular intervals? What kind of structure will the questionnaire or interview guide possess? What question wording should be employed? Should the responses be scaled or open-ended? How will reliability and validity be achieved? Will characteristics of the interviewer influence responses to the measurement questions? What kind of training should the data collectors receive? Is a sample or a census to be taken? What types of sampling should be considered? These questions represent only a few of the decisions that have to be made when just one method is chosen.

Although selecting an appropriate design may be complicated by this range of options, the creative researcher actually benefits from this confusing array of options. The numerous combinations spawned by the abundance of tools may be used to construct alternative perspectives on the same problem. By creating a design using diverse methodologies, researchers are able to achieve greater insight than if they followed the most frequently used method or the method receiving the most media attention. Although pursuing research on a single research problem from a multimethod, multistudy strategy is not currently the norm, such designs are getting increasing attention from researchers and winning numerous industry awards for effectiveness. The advantages of several competing designs should be considered before settling on a final one.



>picprofile

Kraft research won well-deserved recognition for research that helped diagnose and improve sales of sliced cheese by 11.8 percent with a 14.5 percent increase in base volume. Kraft started by sending ethnographers from Strategic Framewor-king to interview moms aged 25 to 64 who were fixing sandwiches in their kitchens. Focus groups then reinforced that moms feel good about giving their kids cheese because of its nutritional value, but that moms would choose a lower-priced cheese, even though their kids preferred Kraft. A subsequent phone survey by Market Facts revealed that moms would buy the pricier Kraft slices due to its extra calcium. Two TV commercials were tested using the “good-taste-plus-the-calcium-they-need” message. The tests revealed that the commercial showing kids scarfing down the gooey sandwiches where the Dairy Fairy delivered the calcium message outperformed a more serious commercial with the same message. Subse-quent copy-testing research by Millward Brown Group revealed that the dual message (taste-preferred/calcium) was heard. www.kraft.com; www.strategicframewor-king.com; www.marketfacts.com; www.millwardbrown.com

Jason’s preference for MindWriter is to collect as much information as possible from an exploration of company records, interviews with company managers of various departments, and multiple phone surveys with CompleteCare service program users. Financial constraints, however, might force Mind-Writer to substitute a less expensive methodology: a self-administered study in the form of a postcard sent to each CompleteCare program user with his or her returned laptop, followed by phone contact with those who don’t return the postcard.

Sampling Design

Another step in planning the research project is to identify the **target population** (those people, events, or records that contain the desired information and can answer the measurement questions) and then determine whether a sample or a census is desired. Taking a **census** requires that the researcher examine or count all elements in the target population. A **sample** examines a portion of the target population, and the portion must be carefully selected to represent that population. If sampling is chosen, the researcher must determine which and how many people to interview, which and how many events to observe, or which and how many records to inspect. When researchers undertake sampling studies, they are inter-ested in estimating one or more population values (such as the percent of satisfied service customers who will buy new MindWriter laptops when the need arises) and/or testing one or more statistical hypotheses (e.g., that highly satisfied CompleteCare service customers will be far more likely to repur-chase the MindWriter brand of laptops).

If a study's objective is to examine the attitudes of U.S. automobile assemblers about quality improvement, the population may be defined as the entire adult population of auto assemblers employed in the auto industry in the United States. Definition of the terms *adult* and *assembler* and the relevant job descriptions included under "assembly" and "auto industry" may further limit the population under study. The investigator may also want to restrict the research to readily identifiable companies in the market, vehicle types, or assembly processes.

The sampling process must then give every person within the target population a known nonzero chance of selection if probability sampling is used. If there is no feasible alternative, a nonprobability approach may be used. Jason knows that his target population comprises MindWriter customers who have firsthand experience with the CompleteCare program. Given that a list of CompleteCare program users (a sample frame) is readily available each month, a probability sample is feasible.

Pilot Testing

The data-gathering phase of the research process typically begins with pilot testing. Pilot testing may be skipped when the researcher tries to condense the project time frame.

A **pilot test** is conducted to detect weaknesses in design and instrumentation and to provide proxy data for selection of a probability sample. It should, therefore, draw subjects from the target population and simulate the procedures and protocols that have been designated for data collection. If the study is a survey to be executed by mail, the pilot questionnaire should be mailed. If the design calls for observation by an unobtrusive researcher, this behavior should be practiced. The size of the pilot group may range from 25 to 100 subjects, depending on the method to be tested, but the respondents do not have to be statistically selected. In very small populations or special applications, pilot testing runs the risk of exhausting the supply of respondents and sensitizing them to the purpose of the study. This risk is generally overshadowed by the improvements made to the design by a trial run.

There are a number of variations on pilot testing. Some of them are intentionally restricted to data collection activities. One form, *pretesting*, may rely on colleagues, respondent surrogates, or actual respondents to refine a measuring instrument. This important activity has saved countless survey studies from disaster by using the suggestions of the respondents to identify and change confusing, awkward, or offensive questions and techniques. One interview study was designed by a group of college professors for EducTV, an educational television consortium. In the pilot test, they discovered that the wording of nearly two-thirds of the questions was unintelligible to the target group, later found to have a median eighth-grade education. The revised instrument used the respondents' language and was successful. Pretesting may be repeated several times to refine questions, instruments, or procedures.

> Stage 4: Data Collection and Preparation

The gathering of data may range from a simple observation at one location to a grandiose survey of multinational corporations at sites in different parts of the world. The method selected will largely determine how the data are collected. Questionnaires, standardized tests, observational forms, laboratory notes, and instrument calibration logs are among the devices used to record raw data.

But what are data? One writer defines **data** as the facts presented to the researcher from the study's environment. First, data may be further characterized by their abstractness, verifiability, elusiveness, and closeness to the phenomenon.⁵ As *abstractions*, data are more metaphorical than real. For example, the growth in GDP cannot be observed directly; only the effects of it may be recorded. Second, data are processed by our senses—often limited in comparison to the senses of other living organisms. When sensory experiences consistently produce the same result, our data are said to be trustworthy because they may be *verified*. Third, capturing data is *elusive*, complicated by the speed at which events occur and the time-bound nature of observation. Opinions, preferences, and attitudes vary from one milieu to another and with the passage of time. For example, attitudes about spending during the late 1980s differed dramatically one decade later within the same population, due to the sustained