The Research Process

Learning Objectives

After reading this chapter, you should understand . . .

1   **Research is decision- and dilemma-centered.**

2   **The research question is the result of careful exploration and analysis and sets the direction for the research project.**

3   **Planning research design demands an understanding of all the stages in the research process.**

4   **Reality testing at each stage of the process is critical to successful implementation of a research proposal.**

Bringing Research to Life

On the return flight from Austin, Jason and Myra were euphoric. "That went really well," he said. "Better even than I hoped for."

"Yes. Terrific," she said. "Just fine. You handled yourself very well, Jason. You were so patient. Of course, we are not home free. We have lots of work ahead before we satisfy the big bosses at Mind-Writer. But it was a good start. Definitely."

"Definitely."

They toasted each other and their visit with the MindWriter product people, especially Gracie Uhura, the product manager. They sat and sipped their drinks, enjoying a feeling of accomplishment.

"On the other hand," said Jason, by and by, "there are going to be a few problems."

"Aren't there always?"

"Gracie wants the sun, the sky, and the moon. She wants everything. Wants to know the demographic characteristics of her users . . . . their job descriptions . . . their salaries . . . their ethnicities . . . their education. Wants to know their perception of your company . . . of the quality of MindWriter's specific models. Wants to know their satisfaction with the purchase channel and with the service department, too."

"What's wrong with wanting all that, if MindWriter is willing to pay?"

"I may perceive the company as hugely profitable and a bottomless source of research dollars, but you and Gracie need to keep your eye on the bottom line. You can bet there is a bean counter somewhere who 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, Mr. Bean Counter is going to strike the question off the list and reduce what MindWriter is willing to pay for."

"Is there no way we can justify knowing everything Gracie wants to know? After all, this is my first project with her. It certainly wouldn't hurt my reputation within MindWriter by showing how well I can deliver what my top executives want."

"Sure there is. Or at least there may be. We can do a pilot study for her of a few hundred customers and see if the ethnic background, or the salary level, or any other nonattitudinal 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."

"Clever!"

"Well, that's why you came to me; we do exemplary research."

"So, am I right in believing you feel we need to propose an exploratory study for that problem first, and propose a larger study later?"

"That would be standard practice. There are questions that have to be resolved before each side can commit to a major study. We want to minimize the risks to both sides. For example, Gracie wants to know the customers' perception 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?' We will have to do a pilot study of a few hundred users to determine if it is really useful to ask them their overall impression of the product."

"I follow you!"

"On the other hand, the repair problem really interests me. We can be reasonably sure that the customers know their own minds when it comes to evaluating their firsthand experience with MindWriter's service department. This business of returning a computer for service is something you experience firsthand, not something in a magazine, and it's worth

studying. I had a chance last night to look over the letters you gave me."

He dug into his briefcase and extracted a sheaf of photocopies. "These are the letters the service department received about MindWriter. And here are notes on phone conversations that Gracie gave me. One person writes, 'My MindWriter was badly damaged on arrival. I could not believe its condition when I unpacked it.' And here, 'The service technicians seemed to be unable to understand my complaint, but once they understood it, they performed immediate repairs.' You and I will boil these down—and possibly dozens more like them—to a couple of representative questions that can be pilot-tested for clarity, reliability, and validity . . . I'll explain these terms later. The point is, MindWriter has to pay for everything Gracie says she wants, what she wants that has a payoff, what she wants that has a payoff and is researchable . . . We are going to be very busy in the next few weeks."

"I understand what you are saying, believe it or not. Yes, you are starting to make good sense. I think we are going to get along."

"You know what, Myra? I'm starting to think you're right."

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 3–1 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 is incorporated into the model (see the elements within the pyramid in Exhibit 3–1 and compare them with Exhibit 3–2). Exhibit 3–1 also organizes this chapter and introduces the remainder of the book.
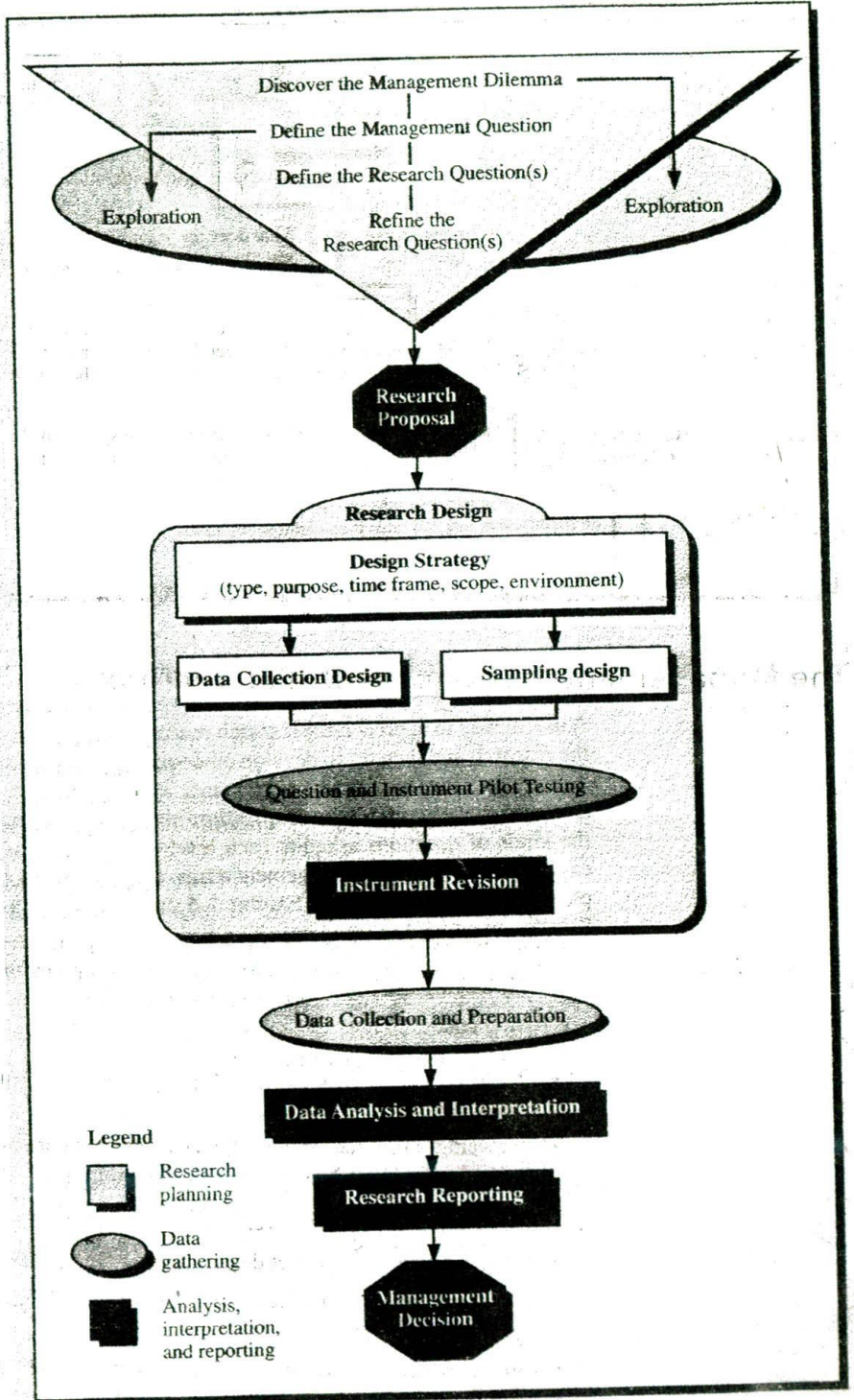
The research process begins much as the vignette suggests. A management dilemma triggers the need for a decision. For MindWriter, a growing number of complaints about postpurchase service started the process. In other situations, a controversy arises, a major commitment of resources is called for, or 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.

EXHIBIT 3–1   The Research Process

Discover the Management Dilemma

Define the Management Question

Define the Research Question(s)

Refine the
Research Question(s)

Exploration

Exploration

Research
Proposal

Research Design

Design Strategy
(type, purpose, time frame, scope, environment)

Data Collection Design

Sampling design

Question and Instrument Pilot Testing

Instrument Revision

Data Collection and Preparation

Data Analysis and Interpretation

Research Reporting

Management
Decision

Legend

Research
planning

Data
gathering

Analysis,
interpretation,
and reporting

EXHIBIT 3–2   Management-Research Question Hierarchy

Management Decision	6	What is the recommended course of action, given the research findings?
Measurement Questions	5	What should be asked or observed to obtain the information the manager needs?
Investigative Questions	4	What does the manager need to know to choose the best alternative from the available courses of action?
Research Question(s)	3	What plausible courses of action are available to management to correct the problem or take advantage of the opportunity, and which should be considered?
Management Question	2	How can management eliminate the negative symptoms? How can management fully capitalize on an opportunity?
Management Dilemma	1	What symptoms cause management concern? What environmental stimuli raise management interest?

The Management-Research Question Hierarchy

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 3–2 provides examples of the kinds of questions asked at each level of the hierarchy, while Exhibit 3–3 further explains the process in management terms. (Exhibit 3–4 follows the MindWriter example through the process, and Exhibit 3–5 provides example questions at each stage for SalePro, a national sales organization facing unexplained sales variations by territory.)
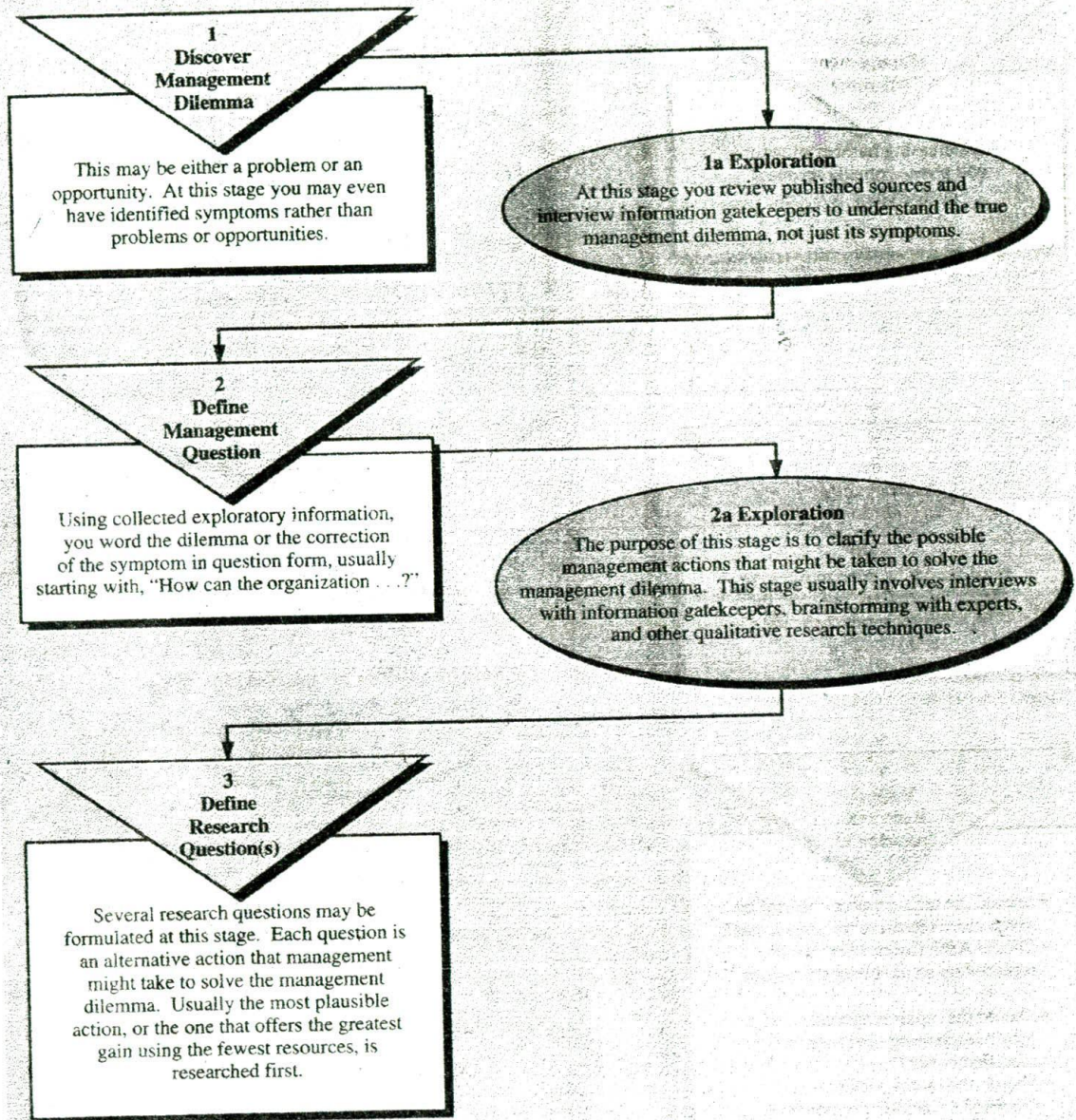
The process begins at the most general level with the **management dilemma.** This is usually a symptom of an actual problem, such as

- 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 (follow the example in Exhibit 3–5).
- 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).

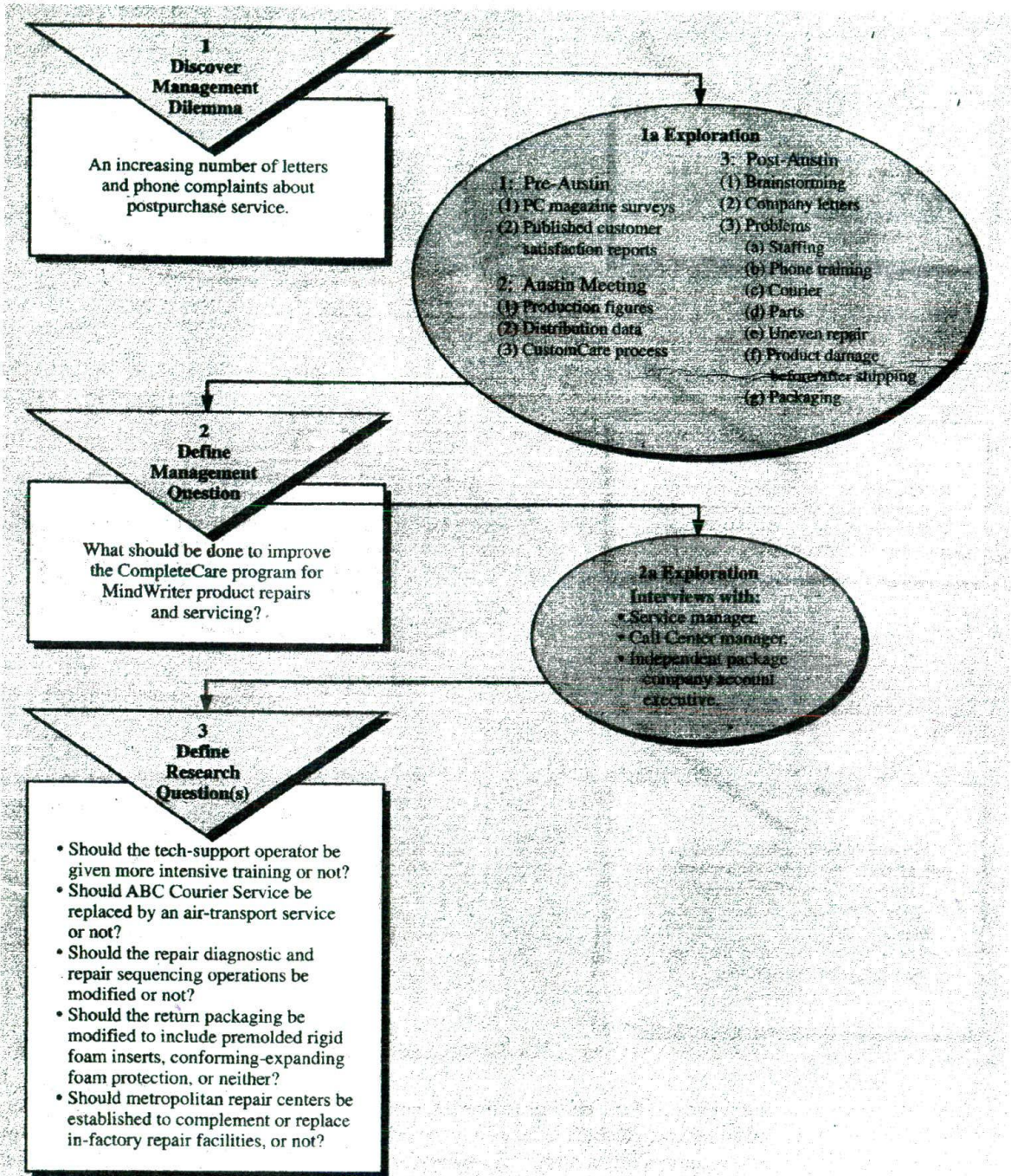You can follow the research process as it develops for MindWriter in Exhibit 3–4.

Identifying management dilemmas is rarely difficult (unless the organization fails to track its performance factors—like sales, profits, employee turnover, manufacturing
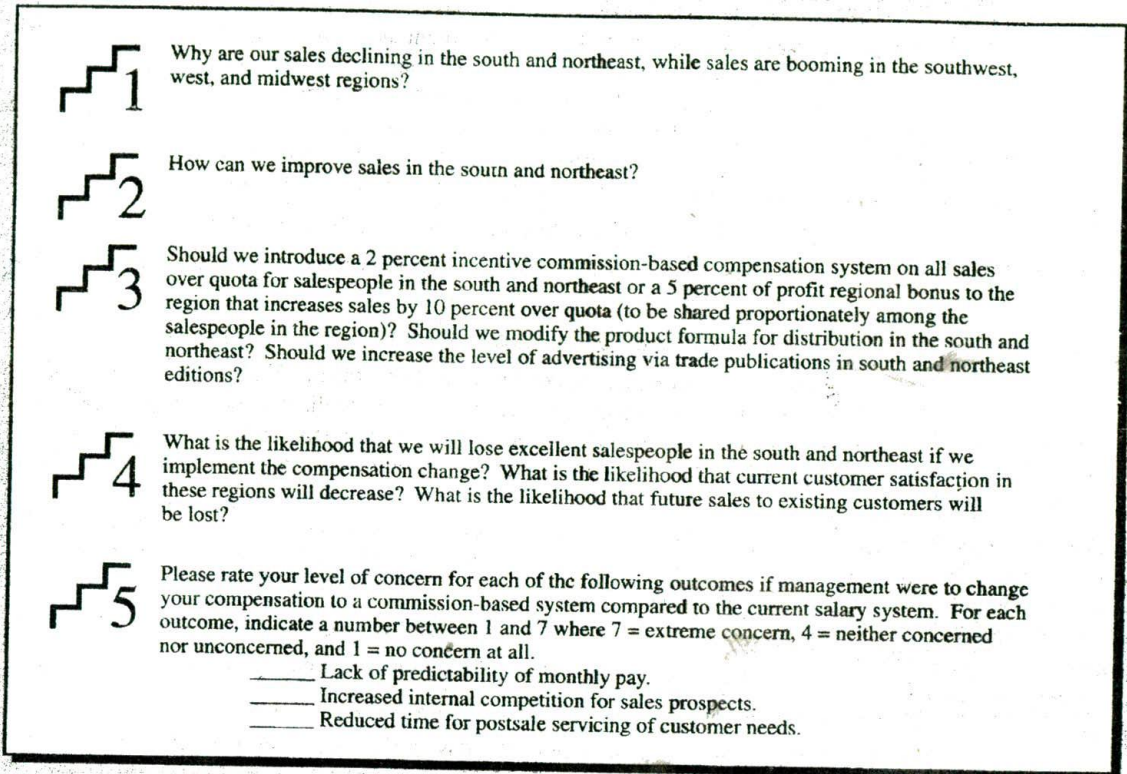
EXHIBIT 3–3   Formulating the Research Question

1
Discover
Management
Dilemma

This may be either a problem or an
opportunity. At this stage you may even
have identified symptoms rather than
problems or opportunities.

1a Exploration
At this stage you review published sources and
interview information gatekeepers to understand the true
management dilemma, not just its symptoms.

2
Define
Management
Question

Using collected exploratory information,
you word the dilemma or the correction
of the symptom in question form, usually
starting with, "How can the organization . . .?"

2a Exploration
The purpose of this stage is to clarify the possible
management actions that might be taken to solve the
management dilemma. This stage usually involves interviews
with information gatekeepers, brainstorming with experts,
and other qualitative research techniques.

3
Define
Research
Question(s)

Several research questions may be
formulated at this stage. Each question is
an alternative action that management
might take to solve the management
dilemma. Usually the most plausible
action, or the one that offers the greatest
gain using the fewest resources, is
researched first.

output and defects, on-time deliveries, customer satisfaction, etc.). However, choosing
one dilemma on which to focus may be difficult. Choosing incorrectly will direct valu-
able resources (time, manpower, money, and equipment) on a path that may not provide
critical decision-making information (the purpose of good research). The choice is like
learning to balance a pencil on its point on your finger, a coin on its edge, or a pyramid
on its pinnacle: 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

EXHIBIT 3–4 Formulating the Research Question for MindWriter

1
Discover Management Dilemma

An increasing number of letters and phone complaints about postpurchase service.

1a Exploration

1. Pre-Austin
(1) PC magazine surveys
(2) Published customer satisfaction reports

2. Austin Meeting
(1) Production figures
(2) Distribution data
(3) CustomCare process

3. Post-Austin
(1) Brainstorming
(2) Company letters
(3) Problems
  (a) Staffing
  (b) Phone training
  (c) Courier
  (d) Parts
  (e) Uneven repair
  (f) Product damage
    • in-transit shipping
  (g) Packaging

2
Define Management Question

What should be done to improve the CompleteCare program for MindWriter product repairs and servicing?

2a Exploration
Interviews with:
• Service manager.
• Call Center manager.
• Independent package company account executive.

3
Define Research Question(s)

• Should the tech-support operator be given more intensive training or not?
• Should ABC Courier Service be replaced by an air-transport service or not?
• Should the repair diagnostic and repair sequencing operations be modified or not?
• Should the return packaging be modified to include premolded rigid foam inserts, conforming-expanding foam protection, or neither?
• Should metropolitan repair centers be established to complement or replace in-factory repair facilities, or not?

EXHIBIT 3–5   SalePro's Management-Research Question Hierarchy

1 Why are our sales declining in the south and northeast, while sales are booming in the southwest, west, and midwest regions?

2 How can we improve sales in the south and northeast?

3 Should we introduce a 2 percent incentive commission-based compensation system on all sales over quota for salespeople in the south and northeast or a 5 percent of profit regional bonus to the region that increases sales by 10 percent over quota (to be shared proportionately among the salespeople in the region)? Should we modify the product formula for distribution in the south and northeast? Should we increase the level of advertising via trade publications in south and northeast editions?

4 What is the likelihood that we will lose excellent salespeople in the south and northeast if we implement the compensation change? What is the likelihood that current customer satisfaction in these regions will decrease? What is the likelihood that future sales to existing customers will be lost?

5 Please rate your level of concern for each of the following outcomes if management were to change your compensation to a commission-based system compared to the current salary system. For each outcome, indicate a number between 1 and 7 where 7 = extreme concern, 4 = neither concerned nor unconcerned, and 1 = no concern at all.
   _____ Lack of predictability of monthly pay.
   _____ Increased internal competition for sales prospects.
   _____ Reduced time for postsale servicing of customer needs.

choice process. In all figures related to the research process model, in this and subsequent chapters, we use a pyramid to represent the management-research question hierarchy and to reinforce the precarious nature of the foundation decisions in the research process.

The Management Question

The manager must move from the management dilemma to the **management question** to proceed with the research process. The management question restates the dilemma in question form:

- What should be done to reduce employee turnover?
- What should be done to increase tenant residency and reduce move-outs?
- What should be done to reduce costs?

Management Question Categories

Management questions are too numerous to list, but we can categorize them:

- Choice of purposes or objectives.
- Generation and evaluation of solutions.
- Troubleshooting or control situation.

The first type concerns the *choice of purposes or objectives*. The general question is, "What do we want to achieve?" At the company level the question might be, "Should we at XYZ Corporation reconsider our basic corporate objectives as they concern our public image?" More narrowly, a management question on objectives might ask, "What goals should XYZ try to achieve in its next round of labor negotiations?"

A second category of management questions concerns the *generation and evaluation of solutions*. The general question is, "How can we achieve the ends we seek?" Research projects in this group usually deal with concrete problems that managers quickly recognize as useful. Projects can involve questions such as,

- "How can we achieve our five-year goal of doubled sales and net profits?"
- "What should be done to improve the CompleteCare program for MindWriter product repairs and servicing?"
- "What should be done to reduce postpurchase service complaints?"

A third class of management questions concerns the *troubleshooting or control situation*. The problem usually involves monitoring or diagnosing various ways in which an organization is failing to achieve its established goals. This group includes questions such as, "Why does our department incur the highest costs?" and "How well is our program meeting its goals?"

The definition of the management question sets the research task. So, a poorly defined management question will misdirect research efforts.

No matter how the management question is defined, many research directions can be taken. A specific question can lead to many studies. Concern for MetalWorks's company image might lead to:

- A survey among various groups to discover their attitudes toward the company.
- Secondary research into what other companies are doing to polish their images.
- A study to forecast expected changes in social attitudes.

The question concerning MetalWorks's labor negotiation objectives might prompt research into recent settlements in the industry or a survey among workers to find out how well management has met its concerns about the quality of work life. It is the joint responsibility of the researcher and the manager to choose the most productive project.

S N A P S H O T   Aquatred 3: Can It Surf to Higher Profits?

Tires certainly have taken their knocks in the new century, with fatalities caused by tread separation leading to several recalls, along with a sluggish auto market and weak tire replacement activity. Even super-performer Goodyear reported, "Sales for the first six months of 2001 were $7 billion, down from $7.3 billion in 2000. Tire volume was 108.1 million units worldwide, down 2 percent from 2000's first half."

But in the midst of all the turmoil in the tire market, Goodyear also unveiled Aquatred 3, a significantly improved version of its groundbreaking Aquatred, which launched the wet-traction segment of the market 10 years ago. In Tire Rack's latest survey, the Aquatred 3 earned customer accolades, beating all other brands in every tire characteristic, including dry traction, cornering stability, and treadwear. Not bad for a wet-traction tire carrying an unbeatable 80,000 mile warranty.

The original Aquatred took more than 10 years to develop. The research that launched the original discovered a new tire segment (the wet-traction segment), second in size only to the longer-treadlife segment. In addition, the original research studied the "planing effect that occurs when a conventional tire travels on wet surfaces." The discovered wedge of water "is what makes most conventional tires lose contact with the roadway."

The newly introduced third-generation tire sports two deflecting channels, rather than the one aquachannel designed into the original Aquatred. It is hoped that Aquatred 3 will catapult Goodyear to increased profitability, just as the original Aquatred made Goodyear the undisputed leader in innovation.

www.goodyear.com

The Nature of the Management Question   Assume, for example, a researcher is asked to help the new management of a bank. The president is concerned about erosion of the bank's profitability (the management dilemma) and wants to turn this situation around. BankChoice is the oldest and largest of three banks in a city with a population of about 50,000. Profits have stagnated in recent years. The president and the consultant discuss the problem facing the organization and settle on this management question: "How can we improve our profit picture?"

The management question does not specify what kind of research is to be done. This question is strictly managerial in thrust. It implies that the bank's management faces the task of developing a strategy for increasing profits. The question is broad. Notice that it doesn't indicate whether management should increase profits via increased deposits, downsizing of personnel, outsourcing of the payroll function, or some other means.

To subdivide a broadly stated management question, look for the underlying causes of the management dilemma.

Further discussion between the bank president and the researcher shows there are really two questions to be answered. The problem of low deposit growth is linked to concerns of a competitive nature. While lowered deposits directly affect profits, another part of the profit weakness is associated with negative factors within the organization that are increasing costs of operation. The qualified researcher knows that the management question as stated is too broad to guide a definitive research project. As a starting point, the broadly worded question is fine, but BankChoice will want to refine its management question into these more specific subquestions:

The primary purpose of research is to reduce the level of risk of a business decision. Knowing that most new product introductions fail, this humorous ad from Greenfield Online suggests not all new product ideas are worthy of consideration and that well-executed research can save a firm from a costly mistake.

- "How can we improve deposits?"
- "How can we reduce costs?"

This separation of the management question into two subquestions may not have occurred without a discussion between the researcher and the manager.

Exploration

BankChoice has done no formal research in the past. It has little specific information about competitors or customers and has not analyzed its internal operations. To move forward in the management-research question hierarchy and define the research question, the client needs to collect some exploratory information on:

- What factors are contributing to the bank's failure to achieve a stronger growth rate in deposits?
- How well is the bank doing regarding work climate, efficiency of operations compared to industry norms, and financial condition compared to industry norms and competitors?

A small focus group is conducted among employees, and trade association data are acquired to compare financial and operating statistics from company annual reports and end-of-year division reports. From the results of these two exploratory activities, it is obvious that BankChoice's operations are not as progressive as its competitors' but it has its costs well in line. So the revised management question becomes, "What should be done to make the bank more competitive?"

The process of exploration may surface within the research process in several locations (see Exhibit 3–3). An **exploration** typically begins with a search of published data. In addition, researchers often seek out people who are well informed on the topic, especially those who have clearly stated positions on controversial aspects of the problem. Take the case of TechByte, a company interested in enhancing its position in a given technology that appears to hold potential for future growth. This interest or need might quickly elicit a number of questions:

- How fast might this technology develop?
- What are the likely applications of this technology?
- What companies now possess it, and which ones are likely to make a major effort to get it?
- How much will it take in resources?
- What are the likely payoffs?

In the above investigation of opportunities, researchers would probably begin with specific books and periodicals. They would be looking only for certain aspects in this literature, such as recent developments, predictions by informed figures about the prospects of the technology, identification of those involved in the area, and accounts of successful ventures or failures by others in the field. After becoming familiar with the literature, researchers might seek interviews with scientists, engineers, and product developers who are well known in the field. They would give special attention to those who represent the two extremes of opinion in regard to the prospects of the technology. If possible, they would talk with persons having information on particularly thorny problems in development and application. Of course, much of the information will be confidential and competitive. However, skillful investigation can uncover many useful indicators.

For MindWriter, Myra searched her local library and company archives to discover PC industry studies on service and technical support (see Exhibit 3–4), as well as published customer satisfaction comparisons among companies and products. Then in the

meeting in Austin, both Myra and Jason delved deeply for Gracie's knowledge and perceptions of the CompleteCare program. They also developed a more thorough understanding of production and distribution. Shortly after returning from Austin, however, Myra and Jason have both realized from reviewing customer correspondence that they need more knowledge on product design, CompleteCare, and product handling, so they plan a second exploratory venture that will include expert interviews.

We discuss the usefulness of a literature search, experience survey, and focus groups in exploration in Chapter 6.

An unstructured exploration allows the researcher to develop and revise the management question and determine what is needed to secure answers to the proposed question.

The Research Question   Once the researcher has a clear statement of the management question, she and the manager must translate it into a research question. Consider the research question to be a fact-oriented, information-gathering question. There are many different ways to address most management dilemmas. It is at this point of formulating research questions where the insight and expertise of the manager come into play. Only reasonable alternatives should be considered. If the researcher is not part of the manager's decision-making environment, the researcher can be of minimal help in this translation. The manager's direction to the researcher is most important. If, however, the researcher is an integral part of the decision-making environment, she may assist the manager in evaluating which courses of action should and can be researched.

Focusing too early on correcting one problem versus another can misdirect the research, wasting valuable resources.

In their post-Austin brainstorming session (see Exhibit 3–4), Jason and Myra hypothesized several possible problems that could have resulted from the complaints in customer letters. Some problems are not as correctable as others (e.g., correcting parts shortages might not be within MindWriter's immediate control, but improving tech-line operator training clearly is). If MindWriter does not maintain a database of complaints, an exploratory study might have to be undertaken to determine which category of complaints is most troublesome. Incorrectly defining the research question is a fundamental weakness in the research process. Time and money can be wasted studying an alternative that won't help the manager rectify the dilemma.

The researcher's task is to assist the manager in formulating a research question that fits the need to resolve the management dilemma. A **research question** is the hypothesis of choice that best states the objective of the research study. It is a more specific management question that must be answered. It may be more than one question, or just one. A research process that answers this more specific question provides the manager with the information necessary to make the decision he or she is facing.

One of the letters Jason reads on the flight back to Florida from the MindWriter meeting in Austin describes the deplorable condition of a MindWriter laptop upon delivery to the customer. After consulting Gracie, Jason and Myra identify several credible options:

- Reinforce the shipping carton with rigid foam inserts (in place of the current plastic sling) to prevent damage to the laptop case during shipping.
- Use conforming-expanding foam insulation in the shipping carton.
- Leave the shipping carton specification as is but ship via an overnight air delivery service rather than using the current ground courier service.
- Establish authorized repair facilities in major cities, so that a customer could deliver a MindWriter for repair, eliminating shipping altogether.

These choices lead to several research questions:

- Should MindWriter change the laptop shipping specifications to include rigid foam or conforming-expanding foam or stay with the current plastic sling?
- Should MindWriter change its shipping carrier from ABC Courier Service to an air transportation service?

Managers often meet to discuss symptoms when developing the management research question hierarchy. Whiteboard technology makes this phase of research planning easier. The managers here are using a Webster TSTM 800 Interactive Whiteboard combined with screen-projected data. This combination encourages full participant involvement in the discussion as the computerized interactive whiteboard captures detailed brainstorming notations and conclusions without the participants taking notes themselves. At the end of the discussion, all participants walk away with the same record of the event.
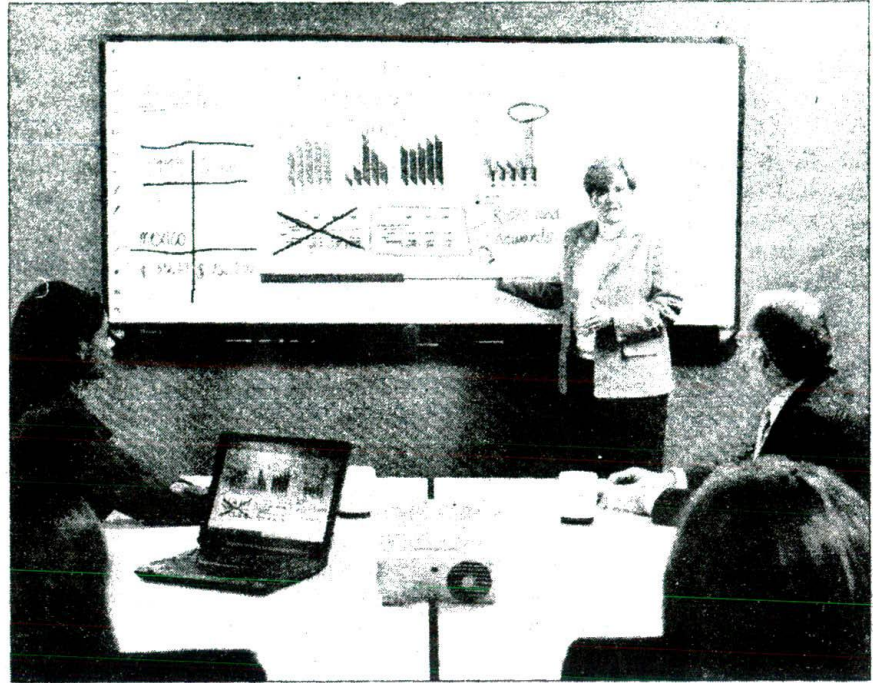
- Should MindWriter establish metropolitan repair centers to complement or replace its existing in-factory repair facilities?

Meanwhile at BankChoice, the president has agreed to have the research be guided by the following research question: "Should BankChoice position itself as a modern, progressive institution (with appropriate changes in services and policies) or maintain its image as the oldest, most reliable institution in town?"

Fine-Tuning the Research Question   The term *fine-tuning* might seem to be an odd usage for research, but it creates an image that most researchers come to recognize. Fine-tuning the question is precisely what a skillful practitioner must do after the exploration is complete. At this point, a clearer picture of the management and research questions begins to emerge. After a preliminary review of the literature, a brief exploratory study, or both, the project begins to crystallize in one of two ways:

1. It is apparent the question has been answered and the process is finished.

2. A question different from the one originally addressed has appeared.

The research question does not have to be materially different, but it will have evolved in some fashion. This is not cause for discouragement. The refined research question(s) will have better focus and will move the research forward with more clarity than the initially formulated question(s).

In addition to fine-tuning the original question, other research question-related activities should be addressed in this phase to enhance the direction of the project:

1. Examine the concepts and constructs to be used in the study. Are they satisfactorily defined? Have operational definitions been employed where appropriate?

MANAGEMENT

Tip

2. Review the research questions with the intent of breaking them down into specific second- and third-level questions.

3. If hypotheses are used, be certain they meet the quality tests mentioned in the preceding chapter.

4. Determine what evidence must be collected to answer the various questions and hypotheses.

5. Set the scope of the study by stating what is *not* a part of the research question. This will establish a boundary to separate contiguous problems from the primary objective.

When the characteristics or plausible causes of the problem are well defined and the research question is clearly stated, it is possible to deduce the essential subquestions that will guide the project planning at this stage of the research process. However, if the research question is somewhat or very poorly defined, the researcher will need further exploration and question revision to refine the original question and generate the material for constructing investigative questions.

Investigative Questions   Once the research question(s) has been selected, researcher thinking moves to a more specific level, that of investigative questions (see Exhibit 3–5). These questions reveal the specific pieces of information the manager feels he or she needs to know to answer the research question.

Investigative questions are questions the researcher must answer to satisfactorily arrive at a conclusion about the research question. To formulate them, the researcher takes a general research question and breaks it into more specific questions about which to gather data. This fractionating process can continue down through several levels of increasing specificity. Investigative questions should be included in the research proposal, for they guide the development of the research design. They are the foundation for creating the research data collection instrument.

The researcher working on the BankChoice project develops two major investigative questions for studying the market with several subquestions under each. The questions provide insight into the lack of deposit growth:

1. What is the public's position regarding financial services and their use?
   a. What specific financial services are used?
   b. How attractive are various services?
   c. What bank-specific and environmental factors influence a person's use of a particular service?
2. What is the bank's competitive position?
   a. What are the geographic patterns of our customers and of our competitors' customers?
   b. What demographic differences are revealed among our customers and those of our competitors?
   c. What words or phrases does the public (both customers and noncustomers) associate with BankChoice? With BankChoice's competitors?
   d. How aware is the public of the bank's promotional efforts?
   e. What opinion does the public hold of the bank and its competitors?
   f. How does growth in services compare among competing institutions?

Return again to the MindWriter situation. What does management need to know to choose among the different packaging specifications? As you develop your information needs, think broadly. In developing your list of investigative questions, include:

- Performance considerations (like the relative costs of the options, the speed of packing serviced laptops, and the condition of test laptops packaged with different materials).

- Attitudinal issues (like perceived service quality).
- Behavioral issues (like employees' ease of use in packing with the considered materials).

Measurement Questions   Measurement questions should be outlined by completion of the project-planning activities but usually await pilot testing for refinement. There are two types of measurement questions: predesigned, pretested questions, and custom-designed questions. Predesigned measurement questions are questions that have been formulated and tested by previous researchers, are recorded in the literature, and may be applied literally or be adapted for the project at hand. Some studies lend themselves to the use of these readily available measurement devices. This provides enhanced validity and can reduce the cost of the project. More often, however, the measurement questions should be custom tailored to the investigative questions. The resources for this task will be the collective insights from all the activities in the research process completed to this point, particularly insights from exploration. Later, during pilot testing of the data collection instrument(s), these custom-designed questions will be refined.

Measurement questions constitute the fifth level of the hierarchy (see Exhibit 3–2). In surveys, **measurement questions** are the questions we actually ask the respondents. They appear on the questionnaire. In an observation study, measurement questions are the observations researchers must record about each subject studied.

BankChoice conducts a survey of local residents. The questionnaire contains many measurement questions seeking information that will provide answers to the investigative questions. Two hundred residents complete questionnaires and the information collected is used to guide a reorientation of the bank's image.

MANAGEMENT

Tip

The assumptions and facts used to structure the management-research question hierarchy set the direction of the project. Using the hierarchy is a good way to think methodically about the various issues. Think of the hierarchy as six sequential levels moving from the general to the specific. While our approach suggests six discrete levels—concluding with the management decision—the hierarchy is actually more of a continuum. The investigative question stage, in particular, may involve several levels of questioning before it is possible to develop satisfactory measurement questions.

Close-Up

The next morning at 7:00 sharp, Myra appears at Jason's home office. As she presses the doorbell, she hears furniture being wrestled across the floor.

"It's open," hollers Jason.

Inside, Jason has cleared furniture and pictures from the south wall and has leaned a sheet of plywood against that wall. "There's coffee and doughnuts," he says. "But first give me a hand with this."

"This" is a roll of brown wrapping paper. The two of them work together and unroll the hard-to-handle paper left to right across the top two feet of plywood, cut it, and tack down its corners so it covers the top half of the plywood.

Then they start on the lower left side of the plywood and repeat the process until the board is fully covered.

They now have a 4- by 8-foot chartboard.

Across the top of the first sheet, Myra writes, "Satisfaction with the service department." Today they focus on the easiest task and leave the customer profile pilot study for later. Besides, Gracie is pressed for answers on how the CompleteCare repair program is being received. If she is responsive on the smaller project, they are sure they will get the OK for the more ambitious one.

They help themselves to coffee and doughnuts, pull two chairs in front of the chartboard and for five minutes stare in silence at its awful blankness.

Jason has learned a lot about MindWriter. Beginning with a visit to the Internet and an intense search through MindWriter's archives before their Austin trip, followed by the meetings in Austin, he knows the product is sold through computer superstores and independent mail-order companies. He also has learned that MindWriter ships about 5,000 portable/laptop computers per month. The product is successful yet constrained by the same supply shortages as the rest of the industry. Personal computer magazines have been consulted for their annual surveys on service, repair, and technical support. Overall customer satisfaction comparisons have been obtained from published sources.

The exploratory sessions in Austin revealed much about the CompleteCare process. Myra summarizes the information under the label "CC Process."

When customers experience a malfunction, they call an 800 number. The call center answers service, support, and ordering questions. Technical representatives are trained to:

- Take the name, phone, address, and MindWriter model number.
- Listen to the customer and ask questions to detect the nature of the problem.
- Attempt to resolve the problem if they can walk the customer through corrective steps.

If unable to resolve the problem, the representative provides a return authorization code and dispatches a package courier to pick up the unit before 5 P.M. The unit is delivered to Austin for service the next morning. The CompleteCare repair facility calls the customer if the repair information is incomplete. The unit is repaired by the end of that day and picked up by the courier. The call center then updates its database with service record information. If all goes well, the customer receives the repaired unit by 10:00 the following morning, 48 hours after MindWriter received the customer's original problem call.

When Myra finishes, Jason begins to rough out the known "problems." There are employee shortages at the call center and difficulties getting the new technical representatives trained. The courier is uneven in executing its pickup and delivery contract. MindWriter is experiencing parts availability problems for some models. And, occasionally, units are returned to the customer either not fixed or damaged in some way. Jason believes this means the service area is not doing an adequate job. But Myra asserts that problems could be in the original packing, in handling, or even from activities related to taking the boxes on and off the shipping pallets.

Because of their brainstorming, they are able to restate management's question: "What should be done to improve the CompleteCare program for MindWriter product repairs and servicing?" After exploration, Myra and Jason brainstorm the following research and investigative questions:

Research Questions

1. Should the technical representative be given more intensive training, or not?
2. Should ABC Courier Service be replaced with an overnight air transport service, or not?
3. Should the repair-diagnostic and repair-sequencing operations be modified, or not?
4. Should the return packaging be modified to include premolded rigid foam inserts, conforming-expanding foam protection, or neither?
5. Should metropolitan repair centers be established to complement or replace in-factory repair facilities, or not?

Investigative Questions

1. How well is the call center helping the customers? Is it helping the customer with instructions? What percentage of customers' technical problems is the center solving without callbacks? How long do customers wait on the phone?
2. How good is the transportation company? Does it pick up and deliver the laptop responsively? How long do customers wait for pickup? Delivery? Are the laptops damaged due to package handling? What available packaging alternatives are cost-effective?
3. How good is the repair group? What is the sequencing of the repair program, diagnostics through completion? Is the repair complete? Are customers' problems resolved? Are new repair problems emerging? Are customers' repair-time expectations being met?
4. (Do this set of questions on your own. See Discussion Question 9 at the end of this chapter.)
5. What is the overall satisfaction with CompleteCare and with the MindWriter product?

Myra now has enough information to go back to Gracie at MindWriter. In particular, Myra wants to know whether she and Jason have translated Gracie's management question in a way that will adequately fulfill Gracie's need for information. They also want to do in-depth interviews with the service manager, the call center manager, and the independent package company's account executive to determine if they are on the right track with their investigative questions. These people will be able to answer some investigative questions. The rest of the investigative questions will need to be translated into measurement questions to ask customers. If Myra and Jason are comfortable with the additional insight from their interviews (and any additional customer letters), they can then develop a questionnaire for CompleteCare customers.

Jason plans to pilot-test the questionnaire with a limited number of customers, revise the questions, set up the logistics, and then roll out the research program. Sampling will be a critical matter. If Gracie's budget is large, they can use a probability sample from the customer list that MindWriter generates every week. This will make telephone interviews possible. If a less expensive alternative is needed, however, they can propose that a questionnaire postcard survey be included with every laptop as it is returned to the customer. They also will do

random sampling from the list of customers who do not respond. Nonresponders will be interviewed on the telephone. This way Myra and Jason can be assured of a cost-effective questionnaire with correction for nonresponse bias.

Myra and Jason devise a tentative schedule before calling to arrange the follow-up interviews (see Exhibit 3–6). They want to give Gracie target dates for completion of the exploratory phase and the instrument and pilot test, as well as a deadline for the first month's results.

EXHIBIT 3–6   A Gantt Chart of the MindWriter Project
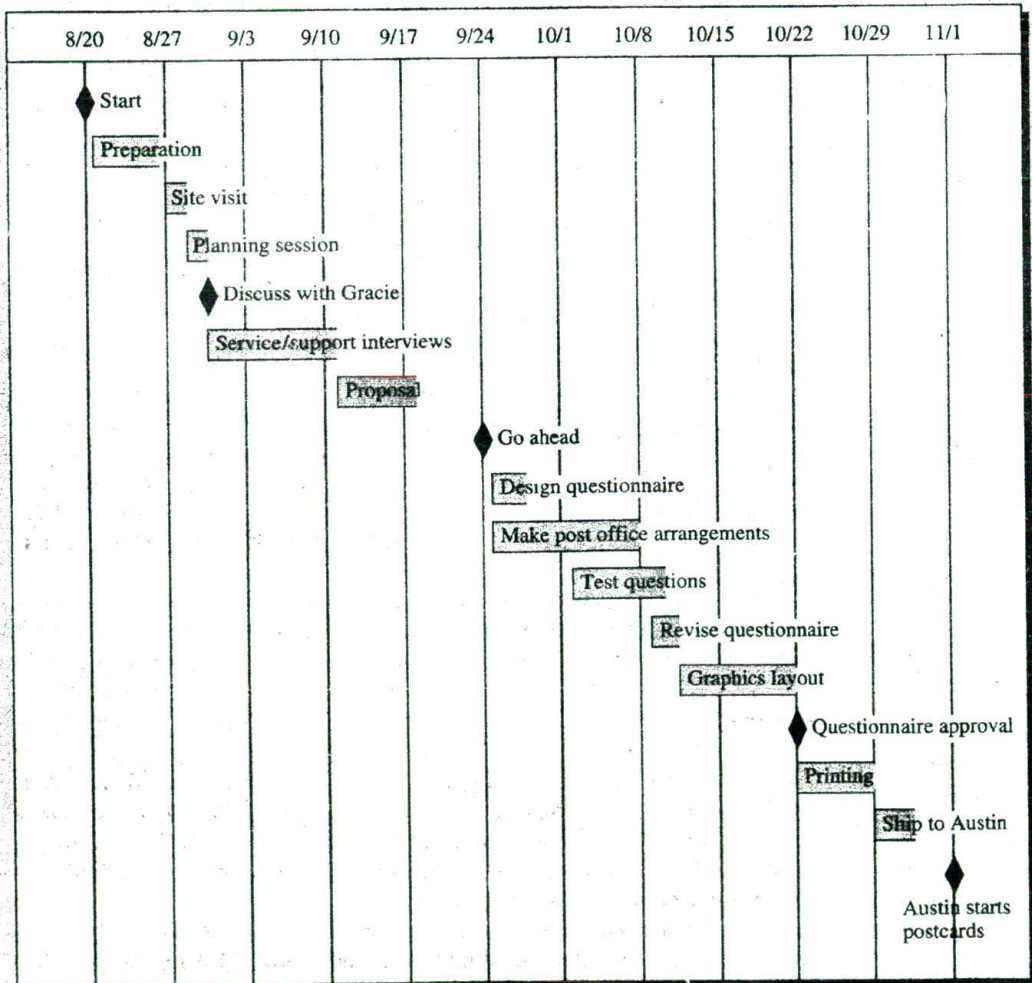
Research Process Problems

Although it is desirable for research to be thoroughly grounded in management decision priorities, studies can wander off target or be less effective than they should be.

The Favored Technique Syndrome

It is the role of the manager sponsoring the research to spot an inappropriate technique-driven research proposal.

We discuss research techniques and when each is appropriate in Chapters 11–14.

Some researchers are method-bound. They recast the management question so it is amenable to their favorite methodology—a survey, for example. Others might prefer to emphasize the case study, while still others wouldn't consider either approach. Not all researchers are comfortable with experimental designs. The past reluctance of most social scientists to use experimental designs is believed to have retarded the development of scientific research in the social science arena.

The availability of technique is an important factor in determining how research will be done or whether a given study can be done. Persons knowledgeable about and skilled in some techniques but not in others are too often blinded by their special competencies. Their concern for technique dominates the decisions concerning what will be studied (both investigative and measurement questions) and how (research design).

Since the advent of Total Quality Management (TQM), numerous, standardized customer satisfaction questionnaires have been developed. Jason may have done studies using these instruments for any number of his clients. Myra should be cautious. She must not let Jason steamroll her into the use of an instrument he has developed for another client, even though he might be very persuasive about its success in the past. Such a technique might not be appropriate for MindWriter's search to resolve postpurchase service dissatisfaction.

Company Database Strip-Mining

In this text, we emphasize projects that tend to be nonroutine, nonrecurring, and complex, rather than those that rely solely on database management.

The existence of a pool of information or a database can distract a manager, seemingly reducing the need for other research. As evidence of the research-as-expense-not-investment mentality mentioned in Chapter 1, managers frequently hear from superiors, "We should use the information we already have before collecting more." Modern management information systems are capable of providing massive volumes of data. This is not the same as saying modern management information systems provide substantial knowledge.

Each field in a database was originally created for a specific reason, a reason that may or may not be compatible with the management question facing the organization. The MindWriter service department's database, for example, probably contains several fields about the type of problem, the location of the problem, the remedy used to correct the problem, and so forth. Jason and Myra can accumulate facts concerning the service, and they can match each service problem with a particular MindWriter model and production sequence (from a production database), and, using yet another database (generated from warranty registration), they can match each problem to a name and address of an owner. But, having done all that, they still aren't likely to know how a particular owner uses his or her laptop or how satisfied an owner was with MindWriter's postpurchase service policies and practices.

Mining management information databases is fashionable and all types of organizations increasingly value the ability to extract meaningful information. While such data mining is often a starting point in decision-based research, rarely will such activity answer all management questions related to a particular management dilemma.

Unresearchable Questions

Not all management questions are researchable, and not all research questions are answerable. To be researchable, a question must be one for which observation or other data collection can provide the answer. Many questions cannot be answered on the basis of information alone.

Questions of value and policy often must be weighed in management decisions. In the MetalWorks study, management may be asking, "Should we hold out for a liberalization of the seniority rules in our new labor negotiations?" While information can be brought to bear on this question, such additional considerations as "fairness to the workers" or "management's right to manage" may be important to the decision. It may be possible for many of these questions of value to be transformed into questions of fact. Concerning "fairness to the workers," one might first gather information from which to estimate the extent and degree to which workers will be affected by a rule change; then one could gather opinion statements by the workers about the fairness of seniority rules. Even so, substantial value elements remain. Questions left unanswered include, "Should we argue for a policy that will adversely affect the security and well-being of older workers who are least equipped to cope with this adversity?" Even if a question can be answered by facts alone, it might not be researchable because currently accepted and tested procedures or techniques are inadequate.

Ill-Defined Management Problems

Some categories of problems are so complex, value-laden, and bound by constraints that they prove to be intractable to traditional forms of analysis. These questions have characteristics that are virtually the opposite of those of well-defined problems. One author describes the differences like this:

> To the extent that a problem situation evokes a high level of agreement over a specified community of problem solvers regarding the referents of the attributes in which it is given, the operations that are permitted, and the consequences of those operations, it may be termed unambiguous or well defined with respect to that community. On the other hand, to the extent that a problem evokes a highly variable set of responses concerning referents of attributes, permissible operations, and their consequences, it may be considered ill-defined or ambiguous with respect to that community.[2]

Another author points out that ill-defined research questions are least susceptible to attack from quantitative research methods because such problems have too many inter-related facets for measurement to handle with accuracy.[3] Yet another authority suggests there are some research questions of this type for which methods do not presently exist or, if the methods were to be invented, they still might not provide the data necessary to solve them.[4] Novice researchers should avoid ill-defined problems. Even seasoned researchers will want to conduct a thorough exploratory study before proceeding with the latest approaches.

Politically Motivated Research

It is important to remember that a manager's motivations for seeking research are not always obvious. Managers might express a genuine need for specific information on which to base a decision. This is the ideal scenario for quality research. Sometimes, however, a research study may not really be desirable but is authorized anyway, chiefly because its presence may win approval for a certain manager's pet idea. At other times, research may be authorized as a measure of personal protection for a decision maker in case he or she is criticized later. In these less-than-ideal cases, the researcher may find it more difficult to win the manager's support for an appropriate research design.

Designing the Study

Here we distinguish secondary data in exploration from secondary data collection as the principal methodology to resolve the management dilemma.

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.

We discuss identifying and classifying various research designs in Chapter 6, while in Part III we provide information on specific methodologies.

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 frequent method encountered in the literature or suggested by a disciplinary bias. Although it must be conceded that students or managers rarely have the resources to pursue a single problem from a multimethod, multistudy strategy, the advantages of several competing designs should be considered before settling on a final one.

Jason's preference for MindWriter is to collect as much information as possible from an exploration of company records, company managers of various departments, and multiple phone surveys. Financial constraints, however, might force the substitution of 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 nonresponders.

SNAPSHOT | Grilled Cheese Sandwiches and the Dairy Fairy

If you were Kraft and discovered that, while sales of sliced cheese were increasing, your brand's sales were decreasing, you might turn to advertising to reverse the slide. But just what would you say—and how? Faced with this situation, Kraft sent ethnographers from Strategic Frameworking to talk with moms aged 25–64 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. Focus groups also revealed that even though their kids preferred Kraft slices, a price difference could persuade moms to purchase a competitive brand. A subsequent phone survey by Market Facts revealed moms would buy the pricier Kraft slices due to extra calcium. Next came TV commercial tests for two spots featuring the "good-taste-plus-the-calcium-they-need" message. A spot featuring a straightforward message didn't score as high as one featuring kids scarfing down gooey grilled cheese sandwiches, but the male

voice-delivered "2-out-of-5-kids-don't-get-enough-calcium" message generated guilt, not positive purchase intentions. A revised commercial featured the cheese-scarfing kids while the Dairy Fairy (an animated cow) delivered the calcium message. Subsequently, Millward Brown Group discovered through copy testing research that the dual message had finally gotten through. The TV commercial aired, delivering an 11.8 percent increase in sales and a 14.5 percent increase in base volume. Sixty-five percent of the growth in sales was attributed to the campaign.

www.kraft.com

www.strategicframeworking.com

www.marketfacts.com

www.millwardbrown.com

www.jwt.com

Sampling Design

Another step in planning the design is to identify the target population and select the sample if a census is not desired. The researcher must determine who and how many people to interview, what and how many events to observe, or what and how many records to inspect. A **sample** is a part of the target population, carefully selected to represent that population. When researchers undertake sampling studies, they are interested in estimating one or more population values and/or testing one or more statistical hypotheses.

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 by 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.

We describe types of samples, sample frames, and the determination of sample size in Chapter 7.

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.

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 share about equally in the budget.

Without budgetary approval, many research efforts are terminated for lack of resources (see Exhibit 3–7). 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.[5]

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."[6] 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.[7] 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 351 percent 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.

We discuss the two-stage study in Chapter 6.

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."

You'll find an example of decision theory in Appendix B.

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.
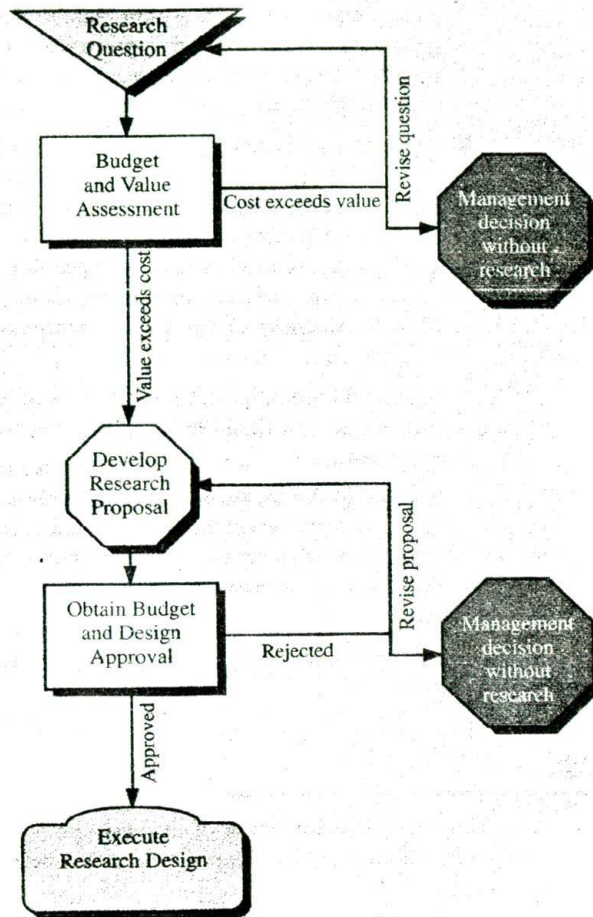
The Research Proposal

Exhibit 3–1 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 3–7.

A written proposal is often required when a study is being suggested. It ensures that the parties concur on the project's purpose and on the proposed methods of investigation. Time and budgets are often spelled out, as are other responsibilities and obligations. Depending on the needs and desires of the manager, substantial background detail and elaboration of proposed techniques may be included.

The length and complexity of research proposals range widely. Business research proposals normally range from 1 to 10 pages. Applicants for foundation or government research grants typically file a proposal request of a few pages, often in a standardized format specified by the granting agency. A research proposal also may be

EXHIBIT 3–7   Research Proposal Process

```
                        ▽ Research
                          Question
                                                          Revise question

        ┌──────────────┐
        │   Budget     │
        │  and Value   │  Cost exceeds value          ⬡ Management
        │  Assessment  │                                  decision
        └──────────────┘                                  without
               │                                          research
        Value exceeds cost
               │
               ▽
            Develop
            Research
            Proposal
               │                                          Revise proposal
        ┌──────────────┐
        │Obtain Budget │
        │  and Design  │      Rejected                 ⬡ Management
        │   Approval   │                                  decision
        └──────────────┘                                  without
               │                                          research
           Approved
               │
          ╭──────────────╮
          │   Execute     │
          │Research Design│
          ╰──────────────╯
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oral, where 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.

Proposal Content   Every proposal, regardless of length, should include two basic sections:

- Statement of the research question.
- Brief description of research methodology.

In a brief memo-type proposal, the research question may be incorporated into a paragraph that also sets out the management dilemma, management question, and categories of investigative questions. The following statements present the management question facing the respective managers and point out the nature of the research that will be undertaken:

1. BankChoice, currently the leading bank in the city, has not been growing as fast as its major competitors. Before developing a long-range plan to enhance the bank's competitive position, it is important to determine the bank's present competitive status, its advantages and opportunities, and its major deficiencies. The primary objective of this proposed research is to develop a body of benchmark information about BankChoice, its major competitors, and the market for banking services.

2. ArtDeco Appliances must choose a location for a new plant to serve eastern markets. Before this location decision is made, a feasibility study should be conducted to determine, for each of five sites, the estimated
   a. Costs of serving existing customers.
   b. Building, relocation, tax, and operating costs.
   c. Availability of local labor in the six major crafts used in production.
   d. Attractiveness of the living environment for professional and management personnel.

A second section includes a statement of what will be done: the bare bones of the research design. For BankChoice, the researcher might propose:

> Personal interviews will be conducted with a minimum of 200 residents to determine their knowledge of, use of, and attitudes toward local banks. In addition, information will be gathered about their banking and financing practices and preferences. Other information of an economic or demographic nature also will be gathered from published sources and public agencies.

We describe more detailed research proposals in Chapter 4.

Often research proposals are much more detailed and describe specific measurement devices that will be used, time and cost budgets, sampling plans, and many other details.

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.

You may find it valuable to refer to Exhibit 3–1 as we overview the content sections of the research proposal.

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.

Data Collection

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. Data may be further characterized by their abstractness, verifiability, elusiveness, and closeness to the phenomenon.[8] As *abstractions,* data are more metaphorical than real. For example, the growth in GNP 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 prosperity within the final four years of the millennium. Finally, data reflect their truthfulness by *closeness to the phenomena. Secondary data* have had at least one level of interpretation inserted between the event and its recording. *Primary data* are sought for their proximity to the truth and control over error. These cautions remind us to use care in designing data collection procedures and generalizing from results.

We address data collection in detail in Part III.

Data are edited to ensure consistency across respondents and to locate omissions. In the case of survey methods, editing reduces errors in the recording, improves legibility, and clarifies unclear and inappropriate responses. Edited data are then put into a form that makes analysis possible. Because it is impractical to place raw data into a report, alphanumeric codes are used to reduce the responses to a more manageable system for storage and future processing. The codes follow various decision rules that the researcher has devised to assist with sorting, tabulating, and analyzing. Personal computers have made it possible to merge editing, coding, and data entry into fewer steps even when the final analysis may be run on a larger system.

Analysis and Interpretation

Managers need information, not raw data. Researchers generate information by analyzing data after its collection. **Data analysis** usually involves reducing accumulated data to a manageable size, developing summaries, looking for patterns, and applying statistical techniques. Scaled responses on questionnaires and experimental instruments often require the analyst to derive various functions, as well as to explore relationships among variables. Further, researchers must interpret these findings in light of the client's research question or determine if the results are consistent with their hypotheses and theories. Increasingly, managers are asking research specialists to make recommendations based on their interpretation of the data.

We address data analysis and interpretation in Chapters 15–19.

A modest example involves a market research firm that polls 2,000 people from its target population for a new generation of wallet-sized portable telephones. Each respondent will be asked four questions:

1. "Do you prefer the convenience of Pocket-Phone over existing cellular telephones?"
2. "Are there transmission problems with Pocket-Phone?"
3. "Is Pocket-Phone better suited to worldwide transmission than your existing cellular phone?"
4. "Would cost alone persuade you to purchase Pocket-Phone?"

The answers will produce 8,000 pieces of raw data. Reducing the data to a workable size will yield eight statistics: the percentage of yes and no answers to each question. When a half-dozen demographic questions about the respondents are added, the total amount of data easily triples. If the researcher scaled the four key questions rather than eliciting yes–no responses, the analysis would likely require more powerful statistical analysis than summarization.

Reporting the Results

Finally, it is necessary to prepare a report and transmit the findings and recommendations to the manager for the intended purpose of decision making. The researcher adjusts the style and organization of the report according to the target audience, the occasion, and the purpose of the research. The results of applied research may be communicated via conference call, letter, written report, oral presentation, or some combination of any or all of these methods. Reports should be developed from the manager's or information user's perspective. The sophistication of the design and sampling plan or the software used to analyze the data may help to establish the researcher's credibility, but in the end, the manager's foremost concern is solving the management dilemma. Thus, the researcher must accurately assess the manager's needs throughout the research process and incorporate this understanding into the final product, the research report.

The management decision maker occasionally shelves the research report without taking action. Inferior communication of results is a primary reason for this outcome. With this possibility in mind, a research specialist should strive for

- Insightful adaptation of the information to the client's needs.
- Careful choice of words in crafting interpretations, conclusions, and recommendations.

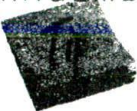*We cover the research report in Chapter 20.*

Occasionally, organizational and environmental forces beyond the researcher's control argue against the implementation of results. Such was the case in a study conducted for the Association of American Publishers, which needed an ad campaign to encourage people to read more books. The project, costing $125,000, found that only 13 percent of Americans buy general-interest books in stores. When the time came to commit $14 million to the campaign to raise book sales, the membership's interest had faded and the project died.[9]

At a minimum, a research report should contain the following:

- An *executive summary* consisting of a synopsis of the problem, findings, and recommendations.

MANAGEMENT

- An *overview of the research*: the problem's background, literature summary, methods and procedures, and conclusions.
- A section on *implementation strategies* for the recommendations.
- A *technical appendix* with all the materials necessary to replicate the project.

SUMMARY

Research originates in the decision process. A manager needs specific information for setting objectives, defining tasks, finding the best strategy by which to carry out the tasks, or judging how well the strategy is being implemented.

A dilemma-centered emphasis—the problem's origin, selection, statement, exploration, and refinement—dominates the sequence of the research process. A management dilemma can originate in any aspect of an organization. A decision to do research can be inappropriately driven by the availability of coveted tools and databases. To be researchable, a problem must be subject to observation or other forms of empirical data collection.

How one structures the research question sets the direction for the project. A management problem or opportunity can be formulated as a hierarchical sequence of questions. At the most general level is the management dilemma. This is translated into a management question and then into a research question—the major objective of the study. In turn, the research question is further expanded into investigative questions. These questions represent the various facets of the problem to be solved, and they influence research design, including design strategy, data collection planning, and sampling. At the most specific level are measurement questions that are answered by respondents in a survey or answered about each subject in an observational study.
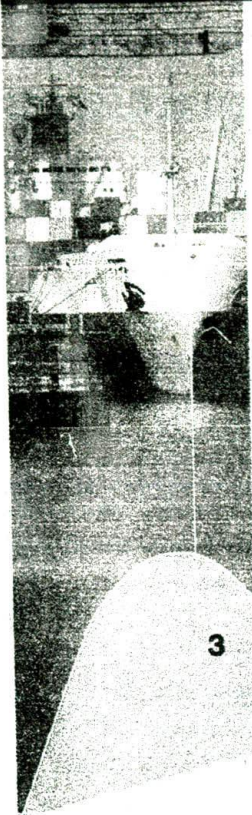
Exploration of the problem is accomplished through familiarization with the available literature, interviews with experts, focus groups, or some combination. Revision of the management or research questions is a desirable outcome of exploration and enhances the researcher's understanding of the options available for developing a successful design.

Decisions concerning the type of study, the means of data collection, measurement, and sampling plans must be made when planning the design. Most researchers undertake sampling studies because of an interest in estimating population values or testing a statistical hypothesis. Carefully constructed delimitations are essential for specifying an appropriate probability sample. Nonprobability samples are also used.

Budgets and value assessments determine whether most projects receive necessary funding. Their thorough documentation is an integral part of the research proposal. Proposals are required for many research projects and should, at a minimum, describe the research question and the specific task the research will undertake.

Pilot tests are conducted to detect weaknesses in the study's design, data collection instruments, and procedures. Once the researcher is satisfied that the plan is sound, data collection begins. Data are collected, edited, coded, and prepared for analysis.

Data analysis involves reduction, summarization, pattern examination, and the statistical evaluation of hypotheses. A written report describing the study's findings is used to transmit the results and recommendations to the intended decision maker. By cycling the conclusions back into the original problem, a new research iteration may begin, and findings may be applied.

KEY TERMS

data 87
data analysis 87
decision rule 84
decision variable 84
exploration 72
investigative questions 75

management dilemma 66
management question 69
management-research question
    hierarchy 66
measurement questions 76

research design 81
research process 64
research question(s) 73
pilot test 86
sample 82

EXAMPLES

Company	Scenario	Page
ArtDeco Appliances*	A company choosing a location for a new manufacturing plant.	86
Association of American Publishers	A trade association that conducted research to develop an ad campaign that would encourage the reading of books.	88
BankChoice*	A bank experiencing eroding profits and lackluster growth.	71
EducTV*	An educational television consortium serving a poorly educated population attempting to assess programming needs.	86
Goodyear Tire & Rubber Company	Research led to Aquatred 3, the most award-winning new product in tire industry history.	70
Kraft	Research was used to develop a new advertising strategy for Kraft Singles.	81
Market Facts, Inc.	Conducted a phone survey to discover what would make moms buy the pricier Kraft Singles.	81
Millward Brown Group	Copy testing research that revealed the "great-taste-with-more-calcium" message was correctly delivered by the Dairy Fairy as spokescharacter, not a male voice-over.	81
MetalWorks*	An industrial company suffering image problems approaching union negotiations.	70
MindWriter*	A computer company assessing customer satisfaction.	BRTL and throughout
Pocket-Phone*	A producer of portable, wallet-sized wireless telephones studying the data collected from a recent survey to assess the newest generation of phones.	88
SalePro*	A national sales organization facing unexplained sales variations by territory.	66
Strategic Frameworking	Conducted an ethnography study for Kraft to help the firm understand what moms who make lunch for their kids want.	81
TechByte*	A company interested in enhancing its position in a given technology that appears to hold potential for future growth.	72

*Due to the confidential and proprietary nature of most research, the names of some companies have been changed.

DISCUSSION QUESTIONS

Terms in Review

1. Some questions are answerable by research and others are not. Using some management problems of your choosing, distinguish between them.

2. Discuss the problems of trading off exploration and pilot testing under tight budgetary constraints. What are the immediate and long-term effects?

3. A company is experiencing a poor inventory management situation and receives alternative research proposals. Proposal 1 is to use an audit of last year's transactions as a basis for recommendations. Proposal 2 is to study and recommend changes to the procedures and systems used by the materials department. Discuss issues of evaluation in terms of

   a. Ex post facto versus prior evaluation.

   b. Evaluation using option analysis and decision theory.

Making Research Decisions

4. Confronted by low productivity, the president of Oaks International Inc. asks a research company to study job satisfaction in the corporation. What are some of the important reasons that this research project may fail to make an adequate contribution to the solution of management problems?

5. You have been approached by the editor of *Gentlemen's Magazine* to carry out a research study. The magazine has been unsuccessful in attracting shoe manufacturers as advertisers. When the sales force tried to secure advertising from shoe manufacturers, they were told men's clothing stores are a small and dying segment of their business. Since *Gentlemen's Magazine* goes chiefly to men's clothing stores, the manufacturers reasoned that it was, therefore, not a good vehicle for their advertising. The editor believes that a survey (via mail questionnaire) of men's clothing stores in the United States will probably show that these stores are important outlets for men's shoes and are not declining in importance as shoe outlets. He asks you to develop a proposal for the study and submit it to him. Develop the management-research question hierarchy that will help you to develop a specific proposal.

6. Based on an analysis of the last six months' sales, your boss notices that sales of beef products are declining in your chain's restaurants. As beef entrée sales decline, so do profits. Fearing beef sales have declined due to several newspaper stories reporting *E. coli* contamination discovered at area grocery stores, he suggests a survey of area restaurants to see if the situation is pervasive.

   a. What do you think of this research suggestion?

   b. How, if at all, could you improve on the vice president's formulation of the research question?

Bringing Research to Life

7. Take one of the possible problems causing MindWriter's management dilemma (see the "Close-Up" on page 76 and Exhibit 3–3) and develop plausible management and research questions.

8. Using the "uneven courier performance" problem or the "product damaged during repair" problem (see the "Close-Up" on page 76 and Exhibit 3–3), develop some exploration activities that would let Jason or Myra proceed to develop a more refined research question dealing with this problem.

9. Using the MindWriter postservicing packaging alternative as the research question, develop appropriate investigative questions within the management-research question hierarchy by preparing an exhibit similar to Exhibit 3–4.

From Concept to Practice

10. Develop the management-research question hierarchy (Exhibits 3–2 and 3–3), citing management dilemma, management question, and research question(s) for each of the following:

  a. The production manager of a shoe factory.

  b. The president of a home health care services firm.

  c. The vice president of labor relations for an auto manufacturer.

  d. The retail advertising manager of a major metropolitan newspaper.

  e. The chief of police in a major city.

11. Develop the management-research question hierarchy for a management dilemma you face at work or with an organization to which you volunteer.

12. Develop a memo-proposal for a research study in which 300 interviews are conducted to address the management question you defined in question 11.

WWW Exercises

Visit our website for Internet exercises related to this chapter at www.mhhe.com/business/cooper8

CASES

CALLING UP ATTENDANCE

GOODYEAR'S AQUATRED

INQUIRING MINDS WANT TO KNOW—NOW!

JOHN DEERE AND COMPANY

KNSD, SAN DIEGO

MASTERING TEACHER LEADERSHIP

NCR: TEEING UP A NEW STRATEGIC DIRECTION

OUTBOARD MARINE CORPORATION

RAMADA DEMONSTRATES ITS PERSONAL BEST

STATE FARM: DANGEROUS INTERSECTIONS ON THE ROAD TO LOSS PREVENTION

*All cases indicating a video icon are located on the Instructor's Videotape Supplement. All nonvideo cases are in the case section of the textbook. All cases indicating a CD icon offer a data set, which is located on the accompanying CD.

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The Research Proposal

Learning Objectives

After reading this chapter, you should understand ...

1 The purpose of the proposal and how it is used by the researcher and management decision maker.

2 The types of proposals and the contents of each.

3 The two processes for evaluating the quality of proposals and when each is used.