3 Discriminant analysis is used to classify people or objects into groups based on several predictor variables. The groups are defined by a categorical variable with two or more values, whereas the predictors are metric. The effectiveness of the discriminant equation is based not only on its statistical significance but also on its success in correctly classifying cases to groups.

4 Multivariate analysis of variance, or MANOVA, is one of the more adaptive techniques for multivariate data. MANOVA assesses the relationship between two or more metric dependent variables and classificatory variables or factors. MANOVA is most commonly used to test differences among samples of people or objects. In contrast to ANOVA, MANOVA handles multiple dependent variables, thereby simultaneously testing all the variables and their interrelationships.

5 Researchers have relied increasingly on structural equation modeling (SEM) to test hypotheses about the dimensionality of, and relationships among, latent and observed variables. Researchers refer to structural equation models as LISREL (linear structural relations) models. The major advantages of SEM are (1) that multiple and interrelated dependence relationships can be estimated simultaneously and (2) that it can represent unobserved concepts, or latent variables, in these relationships and account for measurement error in the estimation process. Researchers using SEM must follow five basic steps: (1) model specification, (2) estimation, (3) evaluation of fit, (4) respecification of the model, and (5) interpretation and communication.

6 Conjoint analysis is a technique that typically handles nonmetric independent variables. Conjoint analysis allows the researcher to determine the importance of product or service attributes and the levels or features that are most desirable. Respondents provide preference data by ranking or rating cards that describe products. These data become utility weights of product characteristics by means of optimal scaling and loglinear algorithms.

7 Principal components analysis extracts uncorrelated factors that account for the largest portion of variance from an initial set of variables. Factor analysis also attempts to reduce the number of variables and discover the underlying constructs that explain the variance. A correlation matrix is used to derive a factor matrix from which the best linear combination of variables may be extracted. In many applications, the factor matrix will be rotated to simplify the factor structure.

8 Unlike techniques for analyzing the relationships between variables, cluster analysis is a set of techniques for grouping similar objects or people. The cluster procedure starts with an undifferentiated group of people, events, or objects and attempts to reorganize them into homogeneous subgroups.

9 Multidimensional scaling (MDS) is often used in conjunction with cluster analysis or conjoint analysis. It allows a respondent's perception about a product, service, or other object of attitude to be described in a spatial manner. MDS helps the business researcher to understand difficult-to-measure constructs such as product quality or desirability, which are perceived and cognitively mapped in different ways by different individuals. Items judged to be similar will fall close together in multidimensional space and are revealed numerically and geometrically by spatial maps.

>keyterms

average linkage method 597
backward elimination 576
beta weights 575
centroid 580
cluster analysis 595
collinearity 577
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specification error 584
standardized coefficients 575
stepwise selection 576
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>discussionquestions

Terms in Review

1 Distinguish among multidimensional scaling, cluster analysis, and factor analysis.

2 Describe the differences between dependency techniques and interdependency techniques. When would you choose a dependency technique?

Making Research Decisions

3 How could discriminant analysis be used to provide insight into MANOVA results where the MANOVA has one independent variable (a factor with two levels)?

4 Describe how you would create a conjoint analysis study of off-road vehicles. Restrict your brands to three, and suggest possible factors and levels. The full-concept description should not exceed 256 decision options.

5 What type of multivariate method do you recommend in each of the following cases and why?

- **a** You want to develop an estimating equation that will be used to predict which applicants will come to your university as students.
- **b** You would like to predict family income using such variables as education and stage in family life cycle.
- **c** You wish to estimate standard labor costs for manufacturing a new dress design.
- **d** You have been studying a group of successful salespeople. You have given them a number of psychological tests. You want to bring meaning out of these test results.

6 Sales of a product are influenced by the salesperson's level of education and gender, as well as consumer income, ethnicity, and wealth.

- **a** Formulate this statement as a multiple regression model (form only, without parameter estimation).
- **b** Specify dummy variables.
- **c** If the effects of consumer income and wealth are not additive alone, and an interaction is expected, specify a new variable to test for the interaction.

7 What multivariate technique would you use to analyze each of the following problems? Explain your choice.

- **a** Employee job satisfaction (high, normal, low) and employee success (0–2 promotions, 3–5 promotions, 5+ promotions) are to be studied in three different departments of a company.
- **b** Consumers making a brand choice decision between three brands of coffee are influenced by their own income levels and the extent of advertising of the brands.
- **c** Consumer choice of color in fabrics is largely dependent on ethnicity, income levels, and the temperature of the geographic area. There is detailed areawide demographic data on income levels, ethnicity, and population, as well as the weather bureau's historical data on temperature. How would you identify geographic areas for selling dark-colored fabric? You have sample data for 200 randomly selected consumers: their fabric color choice, income, ethnicity, and the average temperature of the area where they live.

From Concept to Practice

8 An analyst sought to predict the annual sales for a home-furnishing manufacturer using the following predictor variables:

X_1 = marriages during the year

X_2 = housing starts during the year

X_3 = annual disposable personal income

X_4 = time trend (first year = 1, second year = 2, and so forth)

Using data for 24 years, the analyst calculated the following estimating equation:

$$Y = 49.85 - .068X_1 + .036X_2 + 1.22X_3 - 19.54X_4$$

The analyst also calculated an $R^2 = .92$ and a standard error of estimate of 11.9. Interpret the above equation and statistics.

9 You are working with a consulting group that has a new project for the Palm Grove School System. The school system of this large county has individuals with purchasing, service, and maintenance responsibilities. They were asked to evaluate the vendor/distribution channels of products that the county purchases. The evaluations were on a 10-point metric scale for the following variables:

Delivery speed—amount of time for delivery once the order has been confirmed.

Price level—level of price charged by the product suppliers.

Price flexibility—perceived willingness to negotiate on price.

Manufacturer's image—manufacturer or supplier's image.

Overall service—level of service necessary to preserve a satisfactory relationship between buyer and supplier.

Sales force—overall image of the manufacturer's sales representatives.

Product quality—perceived quality of a particular product.

The data are found on the text CD.

Your task is to complete an exploratory factor analysis on the survey data. The purpose for the consulting group is twofold: (a) to identify the underlying dimensions of these data and (b) to create a new set of variables for inclusion into subsequent assessments of the vendor/distribution channels. Methodology issues to consider in your analysis are:

a Desirability of principal components versus principal axis factoring.

b Decisions on criteria for number of factors to extract.

c Rotation of the factors.

d Factor loading significance.

e Interpretation of the rotated matrix.

Prepare a report summarizing your findings and interpreting your results.

10 A researcher was given the assignment of predicting which of three actions would be taken by the 280 employees in the Desota plant that was going to be sold to its employees. The alternatives were to:

a Take severance pay and leave the company.

b Stay with the new company and give up severance pay.

c Take a transfer to the plant in Chicago.

The researcher gathered data on employee opinions, inspected personnel files and the like, and then did a discriminant analysis. Later, when the results were in, she found the results listed below. How successful was the researcher's analysis?

	Predicted Decision		
Actual Decision	**A**	**B**	**C**
A	80	5	12
B	14	60	14
C	10	15	70

>wwwexercise

FRED II (Federal Reserve Economic Data of the Federal Reserve Bank of St. Louis) is a database of over 1,000 U.S. economic time series. Visit this Web site **(http://research.stlouisfed.org/fred2/),** and select one variable as the dependent variable. What other variables might you use in a multiple regression analysis?

>cases*

Mastering Teacher Leadership

NCRCC: Teeing Up and New Strategic Direction

* All cases appear on the text CD; you will find abstracts of these cases in the Case Abstracts section of this text.

>chapter 21

Presenting Insights and Findings: Written and Oral Reports

"No one, no group, no function, has an inherent right to exist in a company. You are creating value (where none existed before), adding value, maintaining value (status quo), or draining it. Those who drain or maintain value are eventually cut."

***Dave Marcum, author,* businessThink**

>learningobjectives

After reading this chapter, you should understand . . .

1 That a quality presentation of research findings can have an inordinate effect on a reader's or a listener's perceptions of a study's quality.

2 The contents, types, lengths, and technical specifications of research reports.

3 That the writer of a research report should be guided by questions of purpose, readership, circumstances/limitations, and use.

4 That while some statistical data may be incorporated in the text, most statistics should be placed in tables, charts, or graphs.

5 That oral presentations of research findings should be developed with concern for organization, visual aids, and delivery in unique communication settings. Presentation quality can enhance or detract from what might otherwise be excellent research.

"Has it occurred to you that your draft of the MindWriter report has not been touched in the last two days? The stack of marked-up pages is right there on your desk, and you have been working around it."

Jason frowns and momentarily flicks his eyes to the stack of marked pages.

Sally plunges ahead with her complaint. "It's no big deal, you know. You promised to chop out three pages of methodology that nobody will care about but your fellow statistics jocks . . ."—Jason shoots her an aggrieved look—". . . and to remove your recommendations and provide them in a separate, informal letter so that Myra Wines can distribute them under her name and claim credit for your 'brilliance.'"

"I think I have writer's block."

"No. Writer's block is when you can't write. You can't unwrite; that's the problem. You have unwriter's block. Look, some people do great research and then panic when they have to decide what goes in the report and what doesn't. Or they can't take all the great ideas running around in their heads and express their abstractions in words. Or they don't believe they are smart enough to communicate with their clients, or vice versa. So they freeze up. This isn't usually your problem. There is some sort of emotional link to this MindWriter report, Jason; face it."

"I love the MindWriter project."

"Ah, there's the problem," she says. "Jason, I have heard you say that you hate projects for other clients, and I have heard you say that you like projects. But this is the first time I have heard you say you love a project. There comes a time when, after you have nurtured something, you have to let go. Then it isn't yours. It is someone else's, or it is its own thing, but it is not yours."

"I guess you're right," Jason smiles sheepishly. "I'm a little too invested. This MindWriter project was my baby—well, yours and mine. If I chop three pages out of the report, it is finished. Then it belongs to Myra. I don't own it anymore. I can't implement my recommendations. I can't change anything. I can't have second thoughts."

"Fix it, then. Send MindWriter an invoice. Write a proposal for follow-up work. Do something, Jason. Finish it. Let go and move on." Sally smiles and pauses as she is about to leave Jason's office. Jason has pulled the report to the center of his desk, a very good sign.

"By the way, Custom Foods just called. It awarded us the contract for its ideation work. I'd hate to work on that project without you, but . . ."

> Introduction

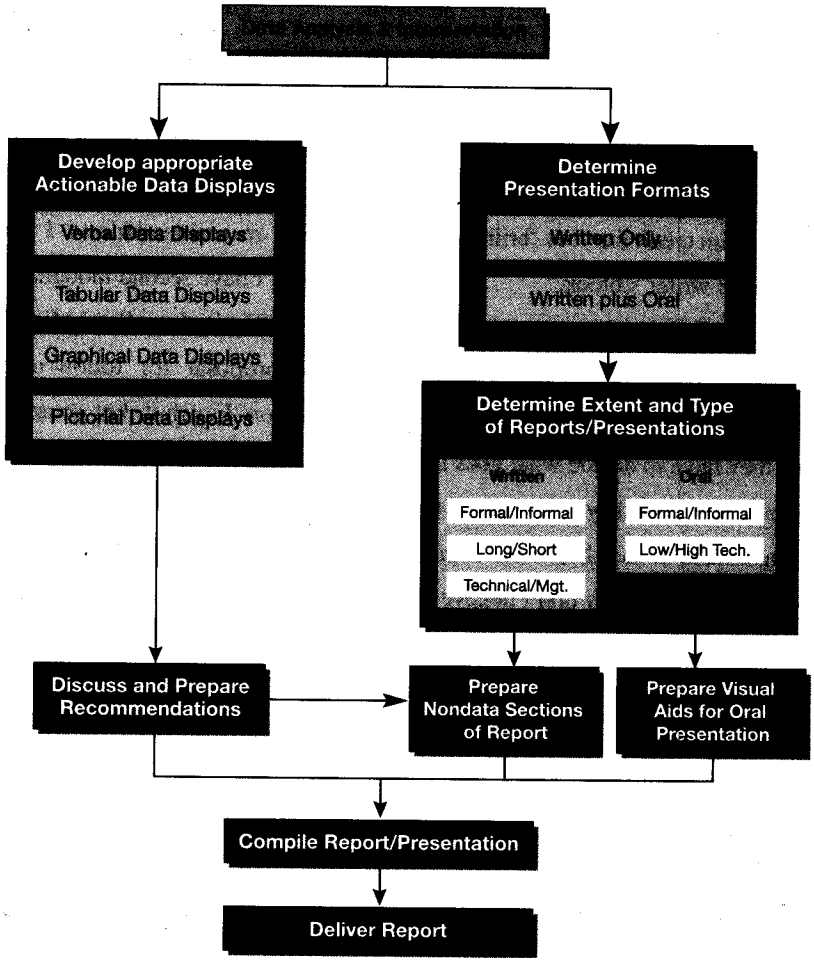
As part of the research proposal, the sponsor and the researcher agree on what types of reporting will occur both during and at the end of the research project. Depending on the budget for the project, a formal oral presentation may not be part of the reporting. A research sponsor, however, is sure to require a written report. Exhibit 21-1 details the reporting phase of the research process.

> The Written Research Report

It may seem unscientific and even unfair, but a poor final report or presentation can destroy a study. Research technicians may ignore the significance of badly reported content, but most readers will be influenced by the quality of the reporting. This fact should prompt researchers to make special efforts to communicate clearly and fully.

The research report contains findings, analyses of findings, interpretations, conclusions, and sometimes recommendations. The researcher is the expert on the topic and knows the specifics in a way no one else can.

> Exhibit 21-1 Sponsor Presentation and the Research Process



Because a written research report is an authoritative one-way communication, it imposes a special obligation for maintaining objectivity. Even if your findings seem to point to an action, you should demonstrate restraint and caution when proposing that course.

Reports may be defined by their degree of formality and design. The formal report follows a well-delineated and relatively long format. This is in contrast to the informal or short report.

Short Reports

Short reports are appropriate when the problem is well defined, is of limited scope, and has a simple and straightforward methodology. Most informational, progress, and interim reports are of this kind: a report of cost-of-living changes for upcoming labor negotiations or an exploration of filing "dumping" charges against a foreign competitor.

Short reports are about five pages. If used on a Web site, they may be even shorter. At the beginning, there should be a brief statement about the authorization for the study, the problem examined, and its breadth and depth. Next come the conclusions and recommendations, followed by the findings that support them. Section headings should be used.

A letter of transmittal is a vehicle to convey short reports. A five-page report may be produced to track sales on a quarterly basis. The report should be direct, make ample use of graphics to show trends, and refer the reader to the research department for further information. Detailed information on the research method would be omitted, although an overview could appear in an appendix. The purpose of this type of report is to distribute information quickly in an easy-to-use format. Short reports are also produced for clients with small, relatively inexpensive research projects.

The letter is a form of a short report. Its tone should be informal. The format follows that of any good business letter and should not exceed a few pages. A letter report is often written in personal style *(we, you),* although this depends on the situation.

Memorandum reports are another variety and follow the *To, From, Subject* format.

These suggestions may be helpful for writing short reports:

- Tell the reader why you are writing (it may be in response to a request).
- If the memo is in response to a request for information, remind the reader of the exact point raised, answer it, and follow with any necessary details.
- Write in an expository style with brevity and directness.
- If time permits, write the report today and leave it for review tomorrow before sending it.
- Attach detailed materials as appendices when needed.

Long Reports

Long reports are of two types, the technical or base report and the management report. The choice depends on the audience and the researcher's objectives.

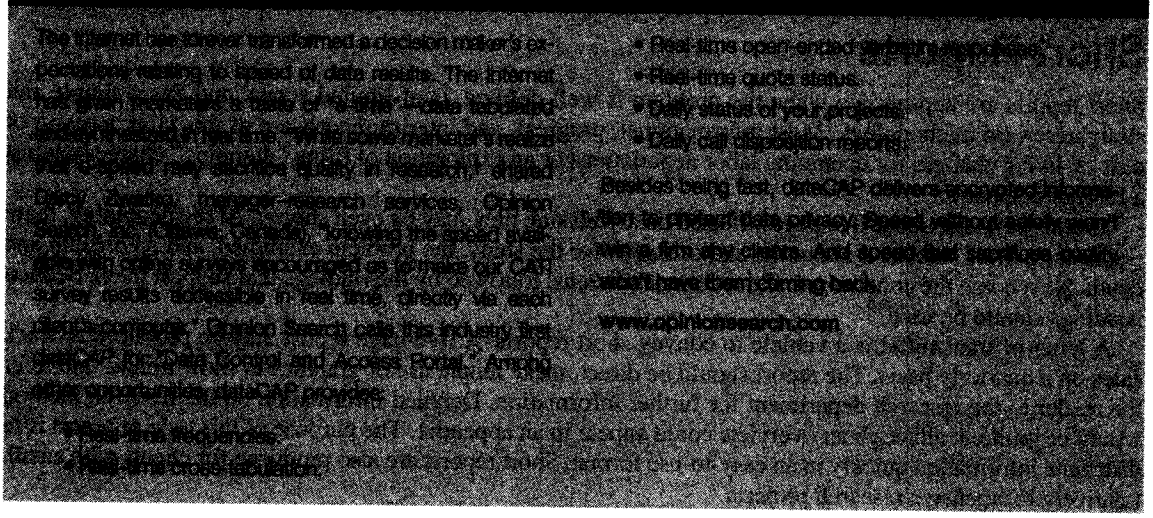
Many projects will require both types of reports: a **technical report,** written for an audience of researchers, and a **management report,** written for the nontechnically oriented manager or client. While some researchers try to write a single report that satisfies both needs, this complicates the task and is seldom satisfactory. The two types of audiences have different technical training, interests, and goals.

The Technical Report

This report should include full documentation and detail. It will normally survive all working papers and original data files and so will become the major source document. It is the report that other researchers will want to see because it has the full story of what was done and how it was done.

>snapshot

E-Speed or No Speed



While completeness is a goal, you must guard against including nonessential material. A good guide is that sufficient procedural information should be included to enable others to replicate the study. This includes sources of data, research procedures, sampling design, data gathering instruments, index construction, and data analysis methods. Most information should be attached in an appendix.

A technical report should also include a full presentation and analysis of significant data. Conclusions and recommendations should be clearly related to specific findings. Technical jargon should be minimized but defined when used. There can be brief references to other research, theories, and techniques. While you expect the reader to be familiar with these references, it is useful to include some short explanations, perhaps as footnotes or endnotes.

The short technical report covers the same items as the long technical report but in an abbreviated form. The methodology is included as part of the introduction and takes no more than a few paragraphs. Most of the emphasis is placed on the findings and conclusions. A memo or letter format covers only the minimum: what the problem is and what the research conclusions are.

The Management Report

In contrast to the technical report, the management report is for the nontechnical client. The reader has little time to absorb details and needs a prompt exposure to the most critical findings; thus the report's sections are in an inverted order. After the prefatory and introductory sections, the conclusions with accompanying recommendations are presented. Individual findings are presented next, supporting the conclusions already made. The appendices present any required methodological details. The order of the management report allows clients to grasp the conclusions and recommendations quickly, without much reading. Then, if they wish to go further, they may read on into the findings. The management report should make liberal use of visual displays.

Sometimes the client has no research background and is interested in results rather than in methodology. The major communication medium in this situation is the management report. It is still helpful to have a technical report if the client later wishes to have a technical appraisal of the study.

The style of the report should encourage rapid reading and quick comprehension of major findings, and it should prompt understanding of the implications and conclusions. The report tone is journalistic and must be accurate. Headlines and underlining for emphasis are helpful; pictures and graphs often replace tables. Sentences and paragraphs should be short and direct. Consider liberal use of white space and wide margins. It may be desirable to put a single finding on each page. It also helps to have a theme running through the report and even graphic or animated characters designed to vary the presentation.

> Research Report Components

Research reports, long and short, have a set of identifiable components. Usually headings and subheadings divide the sections. Each report is individual; sections may be dropped or added, condensed or expanded to meet the needs of the audience. Exhibit 21-2 lists four types of reports, the sections that are typically in-

> Exhibit 21-2 Research Report Sections and Their Order of Inclusion

	Short Report		Long Report	
Report Modules	**Memo or Letter**	**Short Technical**	**Management**	**Technical**
Prefatory information		1	1	1
Letter of transmittal		✓	✓	✓
Title page		✓	✓	✓
Authorization statement		✓	✓	✓
Executive summary		✓	✓	✓
Table of contents		✓	✓	✓
Methodology		✓	✓	3
		(briefly)	(briefly)	
Sampling design				✓
Research design				✓
Data collection				✓
Data analysis				✓
Limitations		✓	✓	✓
Conclusions	2	4	3	5
Summary and conclusions	✓	✓	✓	✓
Recommendations	✓	✓	✓	✓
Bibliography				7

cluded, and the general order of presentation. Each of these formats can be modified to meet the needs of the audience.

Prefatory Items

Prefatory materials do not have direct bearing on the research itself. Instead, they assist the reader in using the research report.

Letter of Transmittal

When the relationship between the researcher and the client is formal, a **letter of transmittal** should be included. This is appropriate when a report is for a specific client (e.g., a company officer) and when it is generated for an outside organization. The letter should refer to the authorization for the project and any specific instructions or limitations placed on the study. It should also state the purpose and the scope of the study. For many internal projects, it is not necessary to include a letter of transmittal.

Title Page

The title page should include four items: the title of the report, the date, and for whom and by whom it was prepared. The title should be brief but include the following three elements: (1) the variables included in the study, (2) the type of relationship among the variables, and (3) the population to which the results may be applied.[1] Redundancies such as "A Report of" and "A Discussion of" add length to the title but little else. Single-word titles are also of little value. Here are three acceptable ways to word report titles:

Descriptive study:	The Five-Year Demand Outlook for Consumer Packaged Goods in the United States
Correlation study:	The Relationship between Relative National Inflation Rates and Household Purchases of Brand X in International Markets
Causal study:	The Effect of Various Motivation Methods on Retail Sales Associates' Attitudes and Performance

Authorization Letter

When the report is sent to a public organization, it is common to include a letter of authorization showing the authority for undertaking the research. This is especially true for reports to federal and state governments and nonprofit organizations. The letter not only shows who sponsored the research but also delineates the original request.

Executive Summary

An **executive summary** can serve two purposes. It may be a report in miniature (sometimes called a *topline report*), covering all the aspects in the body of the report but in abbreviated form. Or it may be a concise summary of the major findings and conclusions, including recommendations. Two pages are generally sufficient for executive summaries. Write this section after the rest of the report is finished. It should not include new information but may require graphics to present a particular conclusion. Expect the summary to contain a high density of significant terms since it is repeating the highlights of the report.

Table of Contents

As a rough guide, any report of several sections that totals more than 6 to 10 pages should have a table of contents. If there are many tables, charts, or other exhibits, they should also be listed after the table of contents in a separate table of illustrations.

>snapshot

Forrester Research: Finding the Dramatic Story Line

In an earlier Snapshot we introduced you to Forrester Research, a firm that does issue-driven research in numerous industries and sells many of its reports by subscription. Forrester takes a modular approach to report writing, whether it's a "brief" drafted in a few hours or a report that might take as many as 30 hours. Each report has three main sections. The "Market Overview" section describes the data collected from interviews, surveys, and secondary searches. It starts by revealing simpler problems and moves on to more complex ones. It doesn't rehash information the audience knows but provides only those data that are new. The "Analysis" section interprets the findings. And the "What It Means" section speculates on the implications of the findings and the analysis.

In one such study, the Market Overview would relate the finding that "40 percent of the time auto dealers have the wrong cars." In the Analysis section, the report would relate that with all the data car manufacturers have about what cars—and features within cars—are selling, a dealer with access to this information should be able to improve his or her inventory mix. Senior analyst Mark Bunger relates that the What It Means section is speculative. "We develop the W-I-M chain—if 'a' was found, then isn't 'b' likely? Or if 'b,' then 'c'; and if 'c,' then 'd.' A lot of deduction and conjecture based on solid knowledge and experience within the industry ends up in the last section of the report. So if 40 percent of the time dealers have the wrong cars, and the manufacturers have the information dealers need, then dealers could improve the inventory to reduce that rate to say 20 percent. And for those prospects who still can't find the car they want? They might be likely to custom build to order to achieve satisfaction." This speculative section is the smallest section of the report.

And when it comes to writing reports, Forrester researchers take the time to find the right words to relay their information. The title takes on special significance, as subscribers often choose the reports they access based on the title. "We'll get more people reading a report if we title it something intriguing like 'Will ad skipping kill television?' than if we call it something drier like 'The implications of technology on viewer control activities in television ad exposure.'"

www.forrester.com

Introduction

The introduction prepares the reader for the report by describing the parts of the project: the problem statement, research objectives, and background material.[2] In most projects, the introduction can be taken from the research proposal with minor editing.

Problem Statement

The problem statement contains the need for the research project. The problem is usually represented by a management question. It is followed by a more detailed set of objectives.

Research Objectives

The research objectives address the purpose of the project. These objectives may be research questions and associated investigative questions. In correlational or causal studies, the hypothesis statements are included. As we discussed in Chapter 2, hypotheses are declarative statements describing the relationship between two or more variables. They state clearly the variables of concern, the relationships among them, and the target group being studied. Operational definitions of critical variables should be included.

Background

Background material may be of two types. It may be the preliminary results of exploration from an experience survey, focus group, or another source. Alternatively, it could be secondary data from the literature review. A traditional organizational scheme is to think of the concentric circles of a target. Starting with the

outside ring, the writer works toward the center. The bull's eye contains the material directly related to the problem. Sources and means for securing this information are presented in Chapter 3 and on your text CD.

Previous research, theory, or situations that led to the management question are also discussed in this section. The literature should be organized, integrated, and presented in a way that connects it logically to the problem. The background includes definitions, qualifications, and assumptions. It gives the reader the information needed to understand the remainder of the research report.[3]

Background material may be placed before the problem statement or after the research objectives. If it is composed primarily of literature review and related research, it should follow the objectives. If it contains information pertinent to the management problem or the situation that led to the study, it can be placed before the problem statement (where it is found in many applied studies).

Methodology

In short reports and management reports, the methodology should not have a separate section; it should be mentioned in the introduction, and details should be placed in an appendix. However, for a technical report, the methodology is an important section, containing at least five parts.

Sampling Design

The researcher explicitly defines the target population being studied and the sampling methods used. For example, was this a probability or nonprobability sample? If probability, was it simple random or complex random? How were the elements selected? How was the size determined? How much confidence do we have, and how much error was allowed?

Explanations of the sampling methods, uniqueness of the chosen parameters, or other points that need explanation should be covered with brevity. Calculations should be placed in an appendix instead of in the body of the report.

Research Design

The coverage of the design must be adapted to the purpose. In an experimental study, the materials, tests, equipment, control conditions, and other devices should be described. In descriptive or ex post facto designs, it may be sufficient to cover the rationale for using one design instead of competing alternatives. Even with a sophisticated design, the strengths and weaknesses should be identified and the instrumentation and materials discussed. Copies of materials are placed in an appendix.

Data Collection

This part of the report describes the specifics of gathering the data. Its contents depend on the selected design. Survey work generally uses a team with field and central supervision. How many people were involved? What was their training? How were they managed? When were the data collected? How much time did it take? What were the conditions in the field? How were irregularities handled? In an experiment, we would want to know about participant assignment to groups, the use of standardized procedures and protocols, the administration of tests or observational forms, manipulation of the variables, and so forth.

Typically, you would include a discussion on the relevance of secondary data that guided these decisions. Again, detailed materials such as field instructions should be included in an appendix.

>snapshot

Online Reporting

Medical Radar International (MRI), a Swedish research company, works exclusively in the pharmaceutical field. It conducts its syndicated study—Radar Dynamics—on the use of pharmaceuticals by doctors across several European countries, by interviewing 150 to 300 physicians (depending on the size of the country) twice each year.

Using a variety of SPSS software products, including In2quest's In2data for database development, Quantum for fast data tabulation, and SmartViewer, MRI can report results quickly. With SmartViewer Web server software, a pharmaceutical company participating in the syndicated study can view password-protected results from Medical Radar's own Web site, even customizing the data in tables that specifically suit its needs, while the underlying data are tamper-protected. Staffen Hallstrom, systems manager at MRI, reports Web distribution is the "ideal method" for distributing its syndicated research reports.

www.medical-radar.com; www.spss.com

Data Analysis

This section summarizes the methods used to analyze the data and describes data handling, preliminary analysis, statistical tests, computer programs, and other technical information. The rationale for the choice of analysis approaches should be clear. A brief commentary on assumptions and appropriateness of use should be presented.

Limitations

This topic is often handled with ambivalence. Some people wish to ignore the matter, feeling that mentioning limitations detracts from the impact of the study. This attitude is unprofessional and possibly unethical. Others seem to adopt a masochistic approach of detailing everything. The section should be a thoughtful presentation of significant methodology or implementation problems. An evenhanded approach is one of the hallmarks of an honest and competent investigator. All research studies have their limitations, and the sincere investigator recognizes that readers need aid in judging the study's validity.

ethical issues

Findings

This is generally the longest section of the report. The objective is to explain the data rather than draw interpretations or conclusions. When quantitative data can be presented, this should be done as simply as possible with charts, graphics, and tables.

The data need not include everything you have collected. The criterion for inclusion is, "Is this material important to the reader's understanding of the problem and the findings?" However, make sure to show findings unfavorable to your hypotheses as well as those that support them, as this reinforces the bond of trust that has developed between researcher and sponsor.

It is useful to present findings in numbered paragraphs or to present one finding per page with the quantitative data supporting the findings presented in a small table or chart on the same page (see Exhibit 21-3). While this arrangement adds to the bulk of the report, it is convenient for the reader.

> Exhibit 21-3 Example of a Findings Page in Central City Bank Market Study

Findings:

1. In this city, *commercial banks are not the preferred savings medium.* Banks are in a weak third place behind money market accounts.
2. Customers of the Central City Bank have a *somewhat more favorable attitude toward bank savings* and less of a preference for government bonds.

Question: Suppose that you have just received an extra $1,000 and have decided to save it. Which of the savings methods listed would be your preferred way to save it?

- ❒ Government bonds
- ❒ Savings and loan
- ❒ Bank savings
- ❒ Credit union
- ❒ Stock
- ❒ Other

Government bonds	24%	20%	29%
Savings and loan	43	45	42
Bank	13	18	8
Credit union	9	7	11
Stock	7	8	5
Other	4	2	5
Total	100%	100%	100%
	n = 216	*n* = 105	*n* = 111

Conclusions

Summary and Conclusions

The summary is a brief statement of the essential findings. Sectional summaries may be used if there are many specific findings. These may be combined into an overall summary. In simple descriptive research, a summary may complete the report, because conclusions and recommendations may not be required.

ethical issues

Findings state facts; conclusions represent inferences drawn from the findings. A writer is sometimes reluctant to make conclusions and leaves the task to the reader. Avoid this temptation when possible. As the researcher, you are the one best informed on the factors that critically influence the findings and conclusions. Good researchers don't draw conclusions that go beyond the data related to the study.

Conclusions may be presented in a tabular form for easy reading and reference. Summary findings may be subordinated under the related conclusion statement. These may be numbered to refer the reader to pages or tables in the findings sections.

Recommendations

Increasingly, researchers are expected to offer ideas for corrective actions. In applied research the recommen-

dations will usually be for managerial action, with the researcher suggesting one or several alternatives that are supported by the findings. Also, researchers may recommend further research initiatives. In basic or pure research, recommendations are often suggestions for further study that broaden or test the understandings of a subject area.

Appendices

The appendices are the place for complex tables, statistical tests, supporting documents, copies of forms and questionnaires, detailed descriptions of the methodology, instructions to field workers, and other evidence important for later support. The reader who wishes to learn about the technical aspects of the study and to look at statistical breakdowns will want a complete appendix.

Bibliography

The use of secondary data requires a bibliography. Long reports, particularly technical ones, require a bibliography. A bibliography documents the sources used by the writer. Although bibliographies may contain work used as background or for further study, it is preferable to include only sources used for preparing the report.

> Writing the Report

Students often give inadequate attention to reporting their findings and conclusions. This is unfortunate. A well-presented study will often impress the reader more than a study with greater scientific quality but with a weaker presentation. Judging a report as competently written is often the key first step to a manager's decision to use the findings in decision making and also to consider implementation of the researcher's recommendations. Report-writing skills are especially valuable to the junior executive or researcher who aspires to rise in an organization. A well-written study frequently enhances career prospects.

Prewriting Concerns

Before writing, one should ask again, "What is the purpose of this report?" Responding to this question is one way to crystallize the problem.

The second prewriting question is, "Who will read the report?" Thought should be given to the needs, temperament, and biases of the audience. You should not distort facts to meet these needs and biases but should consider them while developing the presentation. Knowing who will read the report may suggest its appropriate length. Generally, the higher the report goes in an organization, the shorter it should be.

Another consideration is technical background—the gap in subject knowledge between the reader and the writer. The greater the gap, the more difficult it is to convey the full findings meaningfully and concisely.

The third prewriting question is, "What are the circumstances and limitations under which I am writing?" Is the nature of the subject highly technical? Do you need statistics? Charts? What is the importance of the topic? A crucial subject justifies more effort than a minor one. What should be the scope of the report? How much time is available? Deadlines often impose limitations on the report.

Finally, "How will the report be used?" Try to visualize the reader using the report. How can the information be made more convenient? How much effort must be given to getting the attention and interest of the reader? Will the report be read by more than one person? If so, how many copies should be made? What will be the distribution of the report?

The Outline

Once the researcher has made the first analysis of the data, drawn tentative conclusions, and completed statistical significance tests, it is time to develop an outline. A useful system employs the following organizational structure:

I. Major Topic Heading
  A. Major subtopic heading
    1. Subtopic
      a. Minor subtopic
        (1) Further detail
          (a) Even further detail

Software for developing outlines and visually connecting ideas simplifies this once-onerous task. Two styles of outlining are widely used—the topic outline and the sentence outline. In the **topic outline,** a key word or two are used. The assumption is that the writer knows its significance and will later remember the nature of the argument represented by that word or phrase or, alternatively, the outliner knows that a point should be made but is not yet sure how to make it.

The **sentence outline** expresses the essential thoughts associated with the specific topic. This approach leaves less development work for later writing, other than elaboration and explanation to improve readability. It has the obvious advantages of pushing the writer to make decisions on what to include and how to say it. It is probably the best outlining style for the inexperienced researcher because it divides the writing job into its two major components—what to say and how to say it.

Here is an example of the type of detail found with each of these outlining formats:

Topic Outline	Sentence Outline
I. Demand A. How measured 1. Voluntary error 2. Shipping error a. Monthly variance	I. Demand for refrigerators A. Measured in terms of factory shipments as reported to the U.S. Department of Commerce. 1. Error is introduced into year-to-year comparisons because reporting is voluntary. 2. A second factor is variations from month to month because of shipping and invoicing patterns. a. Variations up to 30 percent this year depending on whether shipments were measured by actual shipment data or invoice date.

The Bibliography

Style manuals provide guidelines on form, section and alphabetical arrangement, and annotation. Proper citation, style, and formats are unique to the purpose of the report. The instructor, program, institution, or client often specifies style requirements. The uniqueness of varying requirements makes detailed examples in this chapter impractical, although the endnotes and references in this book provide an example. As cited in Chapter 4 on the research proposal, we recommend the *Publication Manual of the American Psychological Association;* Kate L. Turabian, *A Manual for Writers of Term Papers, Theses, and Dissertations;* and Joseph Gibaldi, *MLA Handbook for Writers of Research Papers.*

Bibliographic retrieval software allows researchers to locate and save references from online services and translate them into database records. Entries can be further searched, sorted, indexed, and formatted into bibliographies of any style. Many retrieval programs are network-compatible and connect to popular word processors.

Writing the Draft

Once the outline is complete, decisions can be made on the placement of graphics, tables, and charts. Each should be matched to a particular section in the outline. While graphics might be added later or tables changed into charts, it is helpful to make a first approximation of the graphics before beginning to write. Choices for reporting statistics will be reviewed later in this chapter.

Each writer uses different mechanisms for getting thoughts into written form. Some will write in longhand, relying on someone else to transcribe their prose into word-processed format. Others are happiest in front of a word processor, able to add, delete, and move sections at will. Whichever works for you is the best approach to use.

Computer software packages check for spelling errors and provide a thesaurus for looking up alternative ways of expressing a thought. A CD-ROM can call up the 20-volume *Oxford English Dictionary,* believed to be the greatest dictionary in any language. Common word confusion (*there* for *their, to* for *too,* or *effect* for *affect*) will not be found by standard spelling checkers. Advanced programs will scrutinize your report for grammar, punctuation, capitalization, doubled words, transposed letters, homonyms, style problems, and readability level. The style checker will reveal misused words and indicate awkward phrasing. Exhibit 21-4 shows sample output from a commercial package used on one of this text's vignettes. The program shown writes comments to a text file, prepares a backup copy of the original, and generates a statistics report. The

> Exhibit 21-4 Grammar and Style Proofreader Results

Statistics

Statistics for: Chapter Vignette — Problems marked/detected: 8/8

Readability Statistics

Flesch Reading Ease: 66 — Flesch-Kincaid Grade Level: 8
Gunning's Fog Index: 11

Paragraph Statistics

Number of paragraphs: 25 — Average length: 2.2 sentences

Sentence Statistics

Number of sentences:	55	Passive voice:	4
Average length:	13.8 words	Short (< 12 words) :	39
End with "?" :	2	Long (> 28 words) :	7
End with "!" :	0		

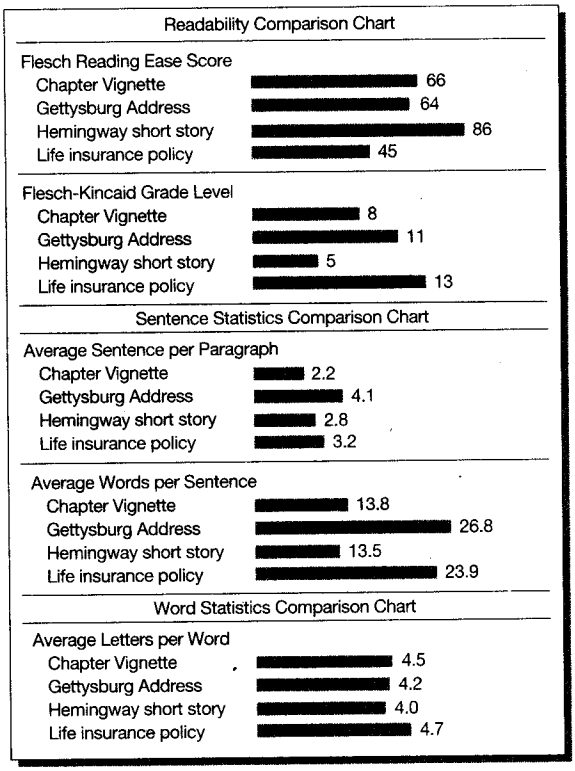
Word Statistics

Number of words: 759 — Average length: 4.58 letters

Document Summary for: Chapter Vignette — Problems detected: 8

Readability Statistics	Interpretation
Grade level: 8 (Flesch-Kincaid)	Preferred level for most readers.
Reading ease score: 66 (Flesch)	This represents 6 to 10 years of schooling.
Passive voice: 331	Writing may be difficult to read or ambiguous for this writing style.
Average sentence length: 13.8 words	Most readers could easily understand sentences of this length.
Average word length: 1.50 syl.	Vocabulary used in this document is understandable for most readers.
Average paragraph length: 2.2 sentences	Most readers could easily follow paragraphs of this length.

Comparisons



statistics summarize the program's evaluation of readability, grade level, and sentence structure. Comparisons to "reference" documents, or documents that you submit for comparison, may be made. The software cannot guarantee an error-free report but will greatly reduce your time in proofreading and enhance the style of the completed product.[4]

Readability

Sensitive writers consider the reading ability of their audience to achieve high readership. You can obtain high readership more easily if the topic interests the readers and is in their field of expertise. In addition, you can show the usefulness of the report by pointing out how it will help the readers. Finally, you can write at a level that is appropriate to the audience's reading abilities. To test writing for difficulty level, use a standard **readability index.** The Flesch Reading Ease Score gives a score between 0 and 100. The lower the score, the harder the material is to read. The Flesch-Kincaid Grade Level and Gunning's Fog Index both provide a score that corresponds with the grade level needed to easily read and understand the document. Although it is possible to calculate these indexes by hand, some software packages will do it automatically. The most sophisticated packages allow you to specify the preferred reading level. Words that are above that level are highlighted to allow you to choose an alternative.

Advocates of readability measurement do not claim that all written material should be at the simplest level possible. They argue only that the level should be appropriate for the audience. They point out that comic books score about 6 on the Gunning scale (that is, a person with a sixth-grade education should be able to read that material). *Time* usually scores about 10, while *The Atlantic* is reported to have a score of 11 or 12. Material that scores much above 12 becomes difficult for the public to read comfortably. Such measures obviously give only a rough idea of the true readability of a report. Good writing calls for a variety of other skills to enhance reading comprehension.

Comprehensibility

Good writing varies with the writing objective. Research writing is designed to convey information of a precise nature. Avoid ambiguity, multiple meanings, and allusions. Take care to choose the right words—words that convey thoughts accurately, clearly, and efficiently. When concepts and constructs are used, they must be defined, either operationally or descriptively.

Words and sentences should be carefully organized and edited. Misplaced modifiers run rampant in carelessly written reports. Subordinate ideas mixed with major ideas make the report confusing to readers, forcing them to sort out what is important and what is secondary when this should have been done for them.

Finally, there is the matter of pace. **Pace** is defined as:

> The rate at which the printed page presents information to the reader. . . . The proper pace in technical writing is one that enables the reader to keep his mind working just a fraction of a second behind his eye as he reads along. It logically would be slow when the information is complex or difficult to understand; fast when the information is straightforward and familiar. If the reader's mind lags behind his eye, the pace is too rapid; if his mind wanders ahead of his eye (or wants to) the pace is too slow.[5]

If the text is overcrowded with concepts, there is too much information per sentence. By contrast, sparse writing has too few significant ideas per sentence. Writers use a variety of methods to adjust the pace of their writing:

- Use ample white space and wide margins to create a positive psychological effect on the reader.
- Break large units of text into smaller units with headings to show organization of the topics.
- Relieve difficult text with visual aids when possible.

- Emphasize important material and deemphasize secondary material through sentence construction and judicious use of italicizing, underlining, capitalization, and parentheses.
- Choose words carefully, opting for the known and short rather than the unknown and long. Graduate students, in particular, seem to revel in using jargon, pompous constructions, and long or arcane words. Naturally, there are times when technical terms are appropriate. Scientists communicate efficiently with jargon, but the audiences for most applied research are not scientifically trained and need more help than many writers supply.
- Repeat and summarize critical and difficult ideas so that readers have time to absorb them.
- Make strategic use of service words. These are words that "do not represent objects or ideas, but show relationship. Transitional words, such as the conjunctions, are service words. So are phrases such as 'on the other hand,' 'in summary,' and 'in contrast.'"[6]

Tone

Review the writing to ensure the tone is appropriate. The reader can, and should, be referred to, but researchers should avoid referring to themselves. One author notes that the "application of the 'you' attitude . . . makes the message sound like it is written to the reader, not sent by the author. A message prepared for the reader conveys sincerity, personalization, warmth, and involvement on the part of the author."[7] To accomplish this, remove negative phrasing and rewrite the thought positively. Do not change your recommendations or your findings to make them positive. Instead, review the phrasing. Which of the following sounds better?

End users do not want the Information Systems Department telling them what software to buy.

End users want more autonomy over their computer software choices.

The messages convey the same information, but the positive tone of the second message does not put readers from the Information Systems Department on the defensive.

Final Proof

It is helpful to put the draft away for a day before doing the final editing. Go to the beach, ride a bicycle in the park, or see a movie—do anything that is unrelated to the research project. Then return to the report and read it with a critical eye. Does the writing flow smoothly? Are there transitions where they are needed? Is the organization apparent to the reader? Do the findings and conclusions adequately meet the problem statement and the research objectives? Are the tables and graphics displaying the proper information in an easy-to-read format? After assuring yourself that the draft is complete, write the executive summary.

Presentation Considerations

The final consideration in the report-writing process is production. Reports can be typed; printed on an ink-jet, laser, color, or other printer; or sent out for typesetting. Most student and small research reports are typed or produced on a computer printer. The presentation of the report conveys to the readers the professional approach used throughout the project. Care should be taken to use compatible fonts throughout the entire report. The printer should produce consistent, easy-to-read letters on quality paper. When reports are photocopied for more than one reader, make sure the copies are clean and have no black streaks or gray areas.

Overcrowding of text creates an appearance problem. Readers need the visual relief provided by ample white space. We define "ample" as 1 inch of white space at the top, bottom, and right-hand margins. On the left side, the margin should be at least 1¼ inches to provide room for binding or punched holes. Even greater margins will often improve report appearance and help to highlight key points or sections. Overcrowding also occurs when the report contains page after page of large blocks of unbroken text. This produces an unpleasant psychological effect on readers because of its formidable appearance. Overcrowded text, however, may be avoided in the following ways:

- Use shorter paragraphs. As a rough guide, any paragraph longer than half a page is suspect. Remember that each paragraph should represent a distinct thought.
- Indent parts of text that represent listings, long quotations, or examples.
- Use headings and subheadings to divide the report and its major sections into homogeneous topical parts.
- Use vertical listings of points (such as this list).

Inadequate labeling creates another physical problem. Each graph or table should contain enough information to be self-explanatory. Text headings and subheadings also help with labeling. They function as signs for the audience, describing the organization of the report and indicating the progress of discussion. They also help readers to skim the material and to return easily to particular sections of the report.

> Presentation of Statistics[8]

The presentation of statistics in research reports is a special challenge for writers. Four basic ways to present such data are in (1) a text paragraph, (2) semitabular form, (3) tables, or (4) graphics.

Text Presentation

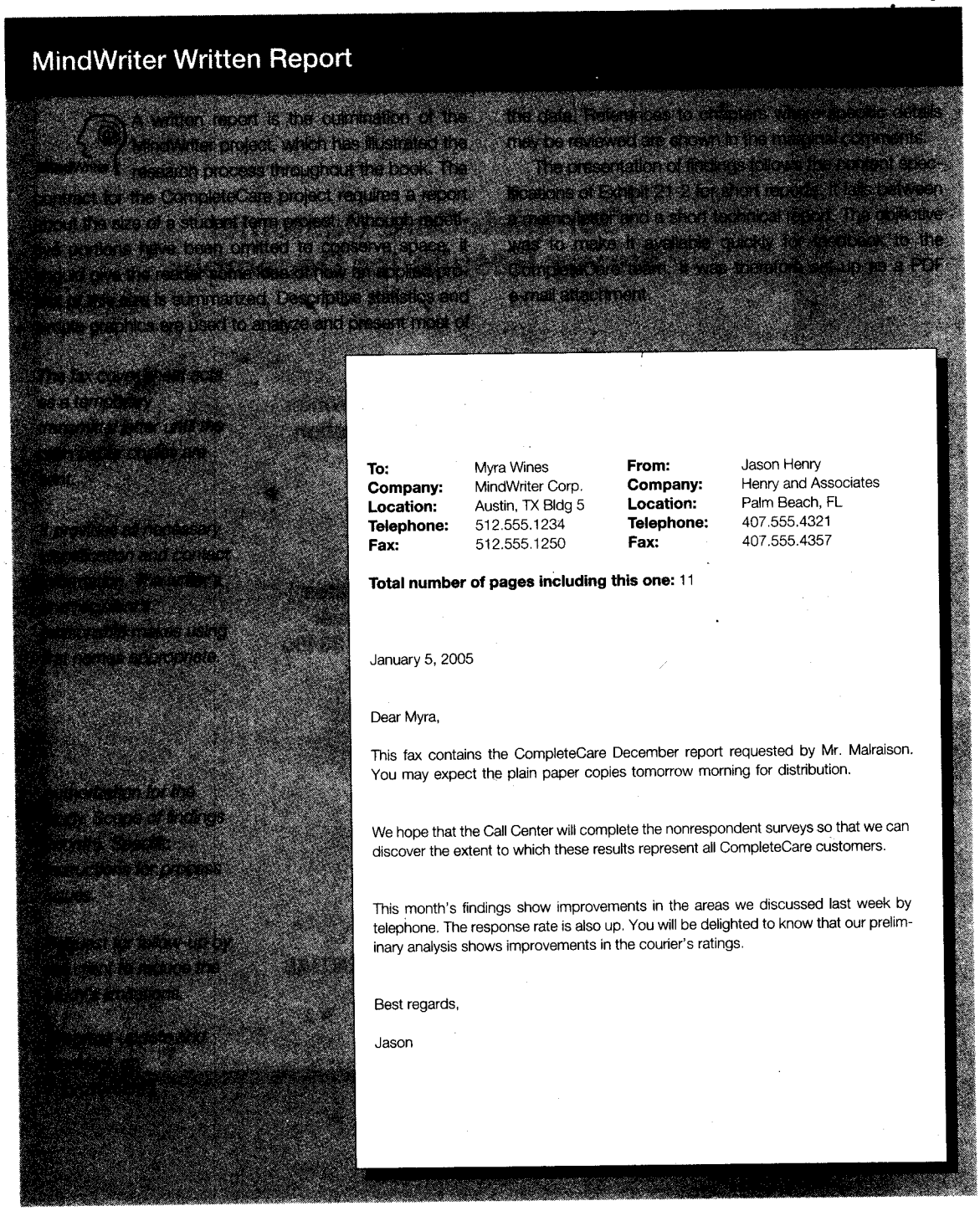
This is probably the most common method of presentation when there are only a few statistics. The writer can direct the reader's attention to certain numbers or comparisons and emphasize specific points. The drawback is that the statistics are submerged in the text, requiring the reader to scan the entire paragraph to extract the meaning. The following material has a few simple comparisons but becomes more complicated when text and statistics are combined:

> Wal-Mart's continued ascendancy to the ranks of super-business is clearly visible in a comparison between it and the Forbes 500 top-ranked business, General Electric. While ranked 6th overall, Wal-Mart surpasses the number 1–ranked GE in overall sales (85.6% greater) and sales growth over the previous year (167.3% greater). In profit growth compared to the previous year, Wal-Mart's 20% profit growth demolishes GE's 7.1%. But GE is still the winner in overall profits where it counts the most: Wal-Mart earns only 53.1% of the manufacturing behemoth.

> This section continues on p. 631.

>closeup

MindWriter Written Report



To:	Myra Wines	**From:**	Jason Henry
Company:	MindWriter Corp.	**Company:**	Henry and Associates
Location:	Austin, TX Bldg 5	**Location:**	Palm Beach, FL
Telephone:	512.555.1234	**Telephone:**	407.555.4321
Fax:	512.555.1250	**Fax:**	407.555.4357

Total number of pages including this one: 11

January 5, 2005

Dear Myra,

This fax contains the CompleteCare December report requested by Mr. Malraison. You may expect the plain paper copies tomorrow morning for distribution.

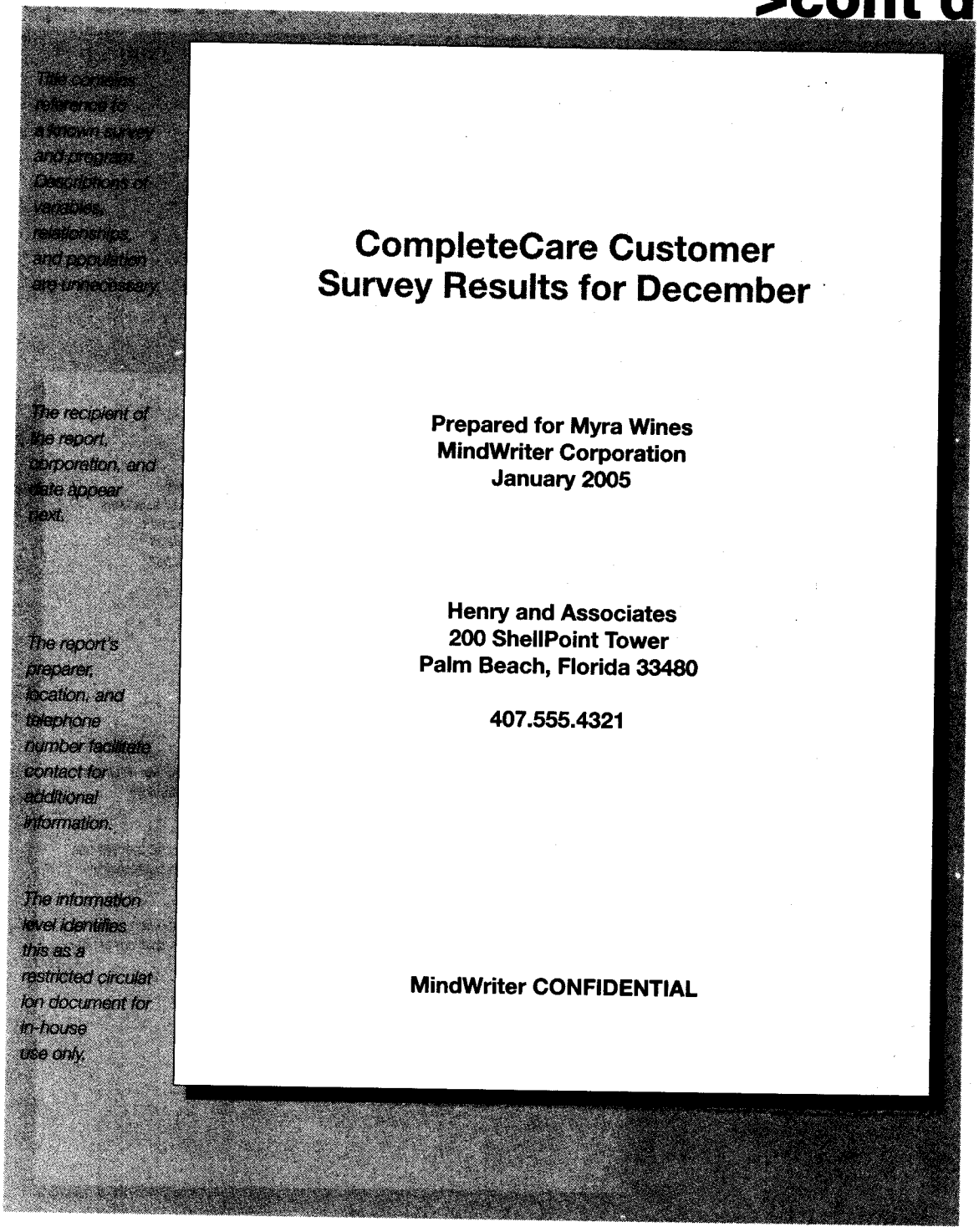
We hope that the Call Center will complete the nonrespondent surveys so that we can discover the extent to which these results represent all CompleteCare customers.

This month's findings show improvements in the areas we discussed last week by telephone. The response rate is also up. You will be delighted to know that our preliminary analysis shows improvements in the courier's ratings.

Best regards,

Jason

>cont'd


This contains reference to a known survey and program. Descriptions of variables, relationships, and population are unnecessary.
The recipient of the report, corporation, and date appear next.
The report's preparer, location, and telephone number facilitate contact for additional information.
The information level identifies this as a restricted circulation document for in-house use only.
CompleteCare Customer Survey Results for December
Prepared for Myra Wines
MindWriter Corporation
January 2005
Henry and Associates
200 ShellPoint Tower
Palm Beach, Florida 33480
407.555.4321
MindWriter CONFIDENTIAL

MindWriter CompleteCare December Results

Introduction

This report is based on the December data collected from the MindWriter Complete-Care Survey. The survey asks customers about their satisfaction with the Complete-Care repair and service system. Its secondary purpose is to identify monthly improvement targets for management.

The findings are organized into the following sections: (1) an executive summary, (2) the methods used, (3) the Service Improvement Grid, (4) detailed findings for each question, and (5) patterns in the open-ended questions.

Executive Summary

The highest degrees of satisfaction with CompleteCare were found in the categories of "delivery speed" and "pickup speed." Average scores on these items were between 4.2 and 4.4 on a 5-point scale. "Speed of repair," "condition on arrival," and "overall impression of CompleteCare's effectiveness" also scored relatively well. They were above the *met all expectations* level (see appropriate charts).

Several questions were below the *met all expectations* level. From the lowest, "Call Center's responsiveness," to "Call.Center's technical competence," and "courier service's arrangements," the average scores ranged from 2.0 to 3.9. In general, ratings have improved since November with the exception of "condition on arrival."

The three items generating the most negative comments are (1) problems with the courier's arrangements, (2) long telephone waits, and (3) transfer among many people at the Call Center. These same comments carry over for the last two months.

CompleteCare's criteria for Dissatisfied Customers consist of negative comments in the Comments/Suggestions section or ratings of less than three (3.0) on questions one through eight. Forty-three percent of the sample met these criteria, down from 56 percent last month. By counting only customers' comments (positive/negative or +/–), the percentage of Dissatisfied Customers would be 32 percent.

The ratio of negative to positive comments was 1.7 to 1, an improvement over November's ratio (2.3 to 1).

>cont'd

When the expectation-based satisfaction scores are adjusted for perceived importance, "Call Center responsiveness," "Call Center technical competence," and "courier arrangements" are identified as action items. "Repair speed" and "problem resolution" maintained high importance scores and are also rated above average.

Methodology

The data collection instrument is a postage-paid postcard that is packed with the repaired product at the time the unit is shipped back to the customer.

The survey consists of 12 satisfaction questions measured on 5-point scales. The questions record the degree to which the components of the CompleteCare process (arrangements for receiving the customer's computer through return of the repaired product) meet customers' *expectations.* A final categorical question asks whether customers will use CompleteCare again. Space for suggestions is provided.

Sample

The sample consisted of 175 customers who provided impressions of CompleteCare's effectiveness. For the four-week period, the response rate was 35 percent with no incentive given. Nothing is yet known about the differences between respondents and nonrespondents.

Service Improvement Grid

The grid on page three compares the degree to which expectations were met along with the *derived importance* of those expectations. The average scores for both axes determine the dividing lines for the four quadrants. The quadrants are labeled to identify actionable items and to highlight those that bear watching for improvement or deterioration.

The **Concentrate Efforts** quadrant is the area where customers are marginally satisfied with service but consider service issues important. Question 1a, "Call Center's responsiveness," Question 1b, "Call Center's technical competence," and Question 2a, "courier arrangements," are found here. "Technical competence" was similarly rated last month. Its perceived importance was rated higher in previous months. "Courier arrangements" has increased in perceived importance over previous reports.

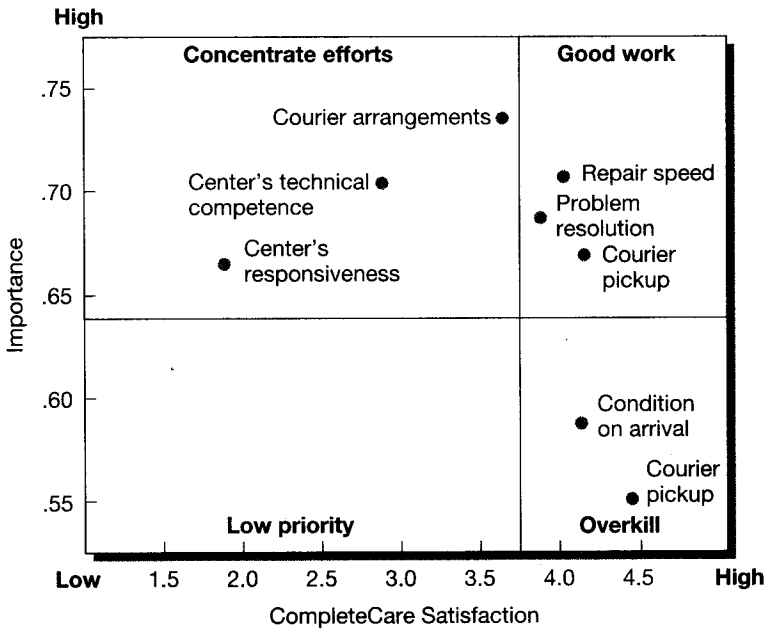
The methodology, reported in brief, reminds the readers of the data collection method, nature and format of the questionnaire, scales used, and target measurement issues.

The sample, a self-selecting nonprobability sample, and the response rate are shown. With respondents' data from the postcards and the Call Center's files on nonrespondents, a future study on nonresponse bias is planned.

This section begins the Findings section. Findings consist of the action planning grid and detailed results sections. The headings were specified by the client.

The method for creating the planning grid and the grid's contents are highlighted.

The statistical technique for producing the grid is correlation. A modification of scatterplots was used to create a plot with reference lines (see Chapter 19).



Note: Satisfaction scores are in the range of 1.0 to 5.0 and importance is in the range of 0 to 1.0.

The contents of each quadrant are described. Comparisons and connections to the next section are previewed.

In the **Good Work** quadrant, CompleteCare has, on average, *met all expectations* with the "repair speed" and "courier pickup" questions. Their mean scores are greater than 4.0 and considered important by respondents. "Problem resolution" has improved but remains a borderline concern.

There are no items in the **Low Priority** quadrant.

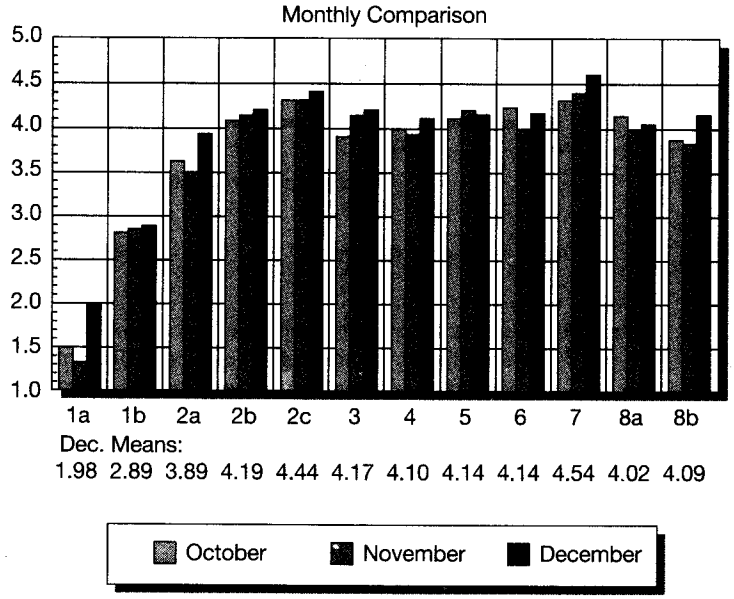
Overkill, the last quadrant, contains two questions. Question 5, "condition on arrival," has improved its ratings over last month but has dropped slightly on the importance scale because the average of importance scores (horizontal line) moved upward. Question 2c, "courier delivery speed," has a high satisfaction rating, but respondents considered this item to have lower importance than most issues in CompleteCare.

>cont'd

Detailed Findings

The figures that follow provide (1) a comparison of the mean scores for each of the questions for the last three months and (2) individual question results. The latter contains frequencies for the scale values, percentages for each category, mean scores, standard deviations, and valid cases for each question. (See Appendix for question wording and placement.)

The three-month comparison (October, November, December) shows results for all scaled questions. December data bars (in dark blue) reveal improvements on all average scores (vertical axis) except Question 5, "condition on arrival." Most aspects of the service/repair process have shown improvement over the three-month period.

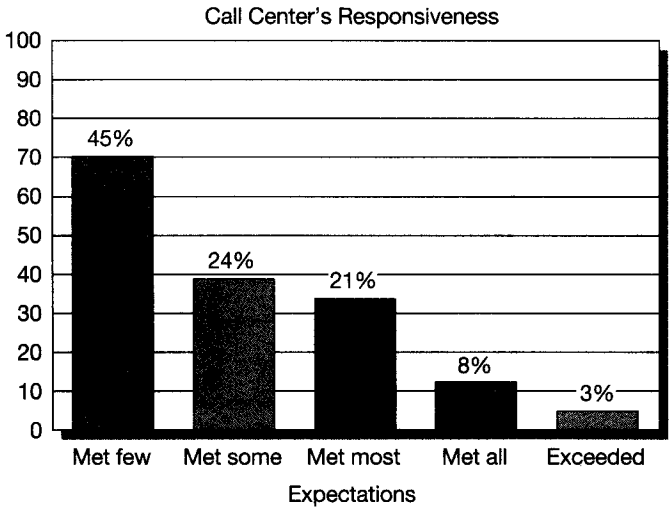


Detailed findings show the results of individual questions. This section announces the two-part content and presents, briefly and in a direct style, the most pertinent outcomes.

This graphic gives the reader a three-month view of all the questions at a glance. Vertical bars are the simplest and easiest to read for the amount of space allocated. Horizontal grid lines guide the eye from the bar tops to the closest value on the mean score axis.

Charts similar to these may be produced by the same spreadsheet that handles data entry. Charting programs offer other options and will import the data from spreadsheets.

Question 1a. Call Center's Responsiveness. This question has the lowest mean score of the survey. Using a top-box method of reporting (combining the top two categories), 11 percent of the respondents felt that the Call Center met or exceeded their expectations for service responsiveness. This has improved only marginally since November and has significant implications for program targets. Based on our visit and recent results, we recommend that you begin immediately the contingency programs we discussed: additional training for Call Center operators and implementation of the proposed staffing plan.

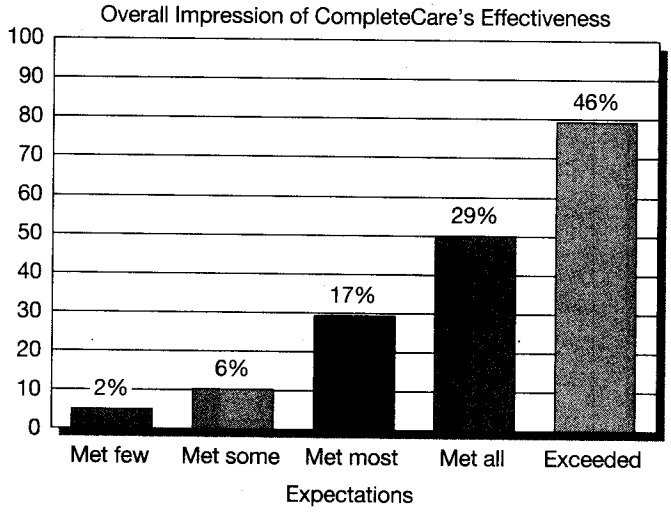


Mean score: 1.98 Standard deviation: 1.09 Valid cases: 159

>cont'd

Question 6 shows the respondents' overall impression of CompleteCare. It would be an ideal dependent variable for a regression study in which questions 1 through 5 were the independent variables (see Chapters 19 and 20).

Question 6. Overall Impression of CompleteCare's Effectiveness. CompleteCare has increased the number of truly satisfied respondents with 46 percent (versus 43 percent in November) in the *exceeded expectations* category. The top-box score has increased to 75 percent of respondents (against 70 percent in November).



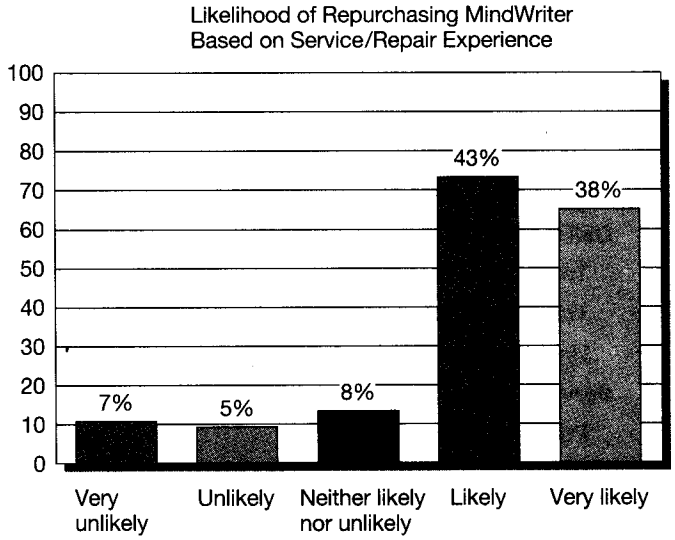
Mean score: 4.14 Standard deviation: 0.98 Valid cases: 169

Question 8a is another question for more detailed research. It allows the researcher to connect the variables that describe the service/repair experience with repurchase intentions.

Question 8a. Likelihood of Repurchasing MindWriter Based on Service/Repair Experience. Respondents' average scores (4.02) for this likelihood scale are the highest this month since measurement began. Improvement of the courier service's arrangements with customers and the resolution of the problem that prompted service appear to be the best predictors of repurchase at this time.

Using regression, it was possible to identify two key influences for this question.

Question 6b (not shown) is similar, asking about the relation of product performance to repurchase intention.



Mean score: 4.02 Standard deviation: 1.10 Valid cases: 165

This questionnaire has one open-ended question that encourages respondents to make comments or suggestions.

Content analysis is used to distill the responses. (See Chapter 16).

Patterns in the Open-Ended Questions

The following categories were found when the comments and suggestions were analyzed. The ratio of negative to positive comments was 1.7 to 1. Pickup problems continue to be "courier only" problems and coordination between MindWriter's telephone support and the courier. Customers complain of holding on the phone for long periods and being transferred between support people. Problems with service are split between large problems that have not been fixed and small, nuisance problems that customers are prepared to live with. Positive comments commend turnaround and service and also praise specific technical operators.

>cont'd

Although content analysis produces more than frequency counts of recurring themes, it is a labor-intensive process. The project's restrictive budget and the needs of the audience made this section of the report adequate for its purpose.

Negative Comments	Count
Shipping	19
Pickup problems (15)	
Delivery problems (2)	
Box damage (1)	
The courier charged customer (1)	
Call Center	19
Too long on hold (9)	
Transferred call too frequently/confusion (8)	
Untrained/hard to understand (2)	
Service	13
Problem continues (5)	
Small things not fixed/damaged (6)	
Took too long (2–7 weeks) (2)	
Product	6
Multiple repairs needed (3)	
Paint wears off (2)	
General dislike of product (1)	
Positive Comments	
General positive comment about the process	13
Quick response	12
Great service	7
Helpful phone personnel	6
Other Comments	
MindWriter shouldn't need to be repaired	4
Provide more information on what was done	2
Offer extended warranty	1
Won't use MindWriter Call Center again	1

This report's appendix contains a copy of the questionnaire.

Appendix Contents
Sample Questionnaire

MindWriter personal computers offer you ease of use and maintenance. When you need service, we want you to rely on **CompleteCare,** wherever you may be. That's why we're asking you to take a moment to tell us how well we've served you.

Met **few** expectations 1 | Met **some** expectations 2 | Met **most** expectations 3 | Met **all** expectations 4 | **Exceeded** expectations 5

1. Telephone assistance with your problem:						
a. Responsiveness	1	2	3	4	5	
b. Technical competence	1	2	3	4	5	
2. The courier service's effectiveness:						
a. Arrangements	1	2	3	4	5	
b. Pickup speed	1	2	3	4	5	
c. Delivery speed	1	2	3	4	5	
3. Speed of the overall repair process.	1	2	3	4	5	
4. Resolution of the problem that prompted service/repair.	1	2	3	4	5	
5. Condition of your MindWriter on arrival.	1	2	3	4	5	
6. Overall impression of CompleteCare's effectiveness.	1	2	3	4	5	
7. Likelihood of using CompleteCare on another occasion. (1 = very unlikely 3 = neither likely nor unlikely 5 = very likely)	1	2	3	4	5	
8. Likelihood of repurchasing a MindWriter based on: (1 = very unlikely 3 = neither likely nor unlikely 5 = very likely)						
a. Service/repair experience	1	2	3	4	5	
b. Product performance	1	2	3	4	5	

Comments/Suggestions: _____

_____

_____

How may we contact you to follow up on any problems you have experienced?

_____ (_____) _____
Last Name First Name Phone

_____
City State Zip

Semitabular Presentation

When there are just a few figures, they may be taken from the text and listed. Lists of quantitative comparisons are much easier to read and understand than embedded statistics. An example of a semitabular presentation is shown below:

> Wal-Mart's continued ascendancy to the ranks of super-business is clearly visible in a comparison between it and the Forbes 500 top-ranked business, General Electric:

- Wal-Mart's sales ($244.5 billion) are 85.6% greater than GE's sales ($131.6 billion).
- Wal-Mart's sales growth (12.3%) is 1.7 times greater than GE's sales growth (4.6%).
- Wal-Mart's profit growth (20.5%) is 2.9 times greater than GE's profit growth (7.1%).
- GE's profits ($15.133 billion), however, are 1.9 times greater than Wal-Mart's ($8.039 billion).

Tabular Presentation

Tables are generally superior to text for presenting statistics, although they should be accompanied by comments directing the reader's attention to important figures. Tables facilitate quantitative comparisons and provide a concise, efficient way to present numerical data.

Wal-Mart's continued ascendancy to the ranks of super-business is clearly visible in a comparison between it and the Forbes 500 top-ranked business, General Electric. Wal-Mart exceeds General Electric in sales, sales growth, and profit growth, but not in profits.

How Wal-Mart Compares	Rank	Sales ($, millions)	Sales Growth over Prior Yr.	Profits ($, millions)	Profit Growth over Prior Yr.
General Electric	1	$131,698	4.60%	$15,133.00	7.1%
Wal-Mart	6	$244,524	12.30%	$8,039.00	20.5%

Source: 2003 Forbes 500, http://wwwforbes.com/2003/03/26/500sland.html.

Tables are either general or summary in nature. General tables tend to be large, complex, and detailed. They serve as the repository for the statistical findings of the study and are usually in the appendix of a research report.

Summary tables contain only a few key pieces of data closely related to a specific finding. To make them inviting to the reader (who often skips them), the table designer should omit unimportant details and collapse multiple classifications into composite measures that may be substituted for the original data.

Any table should contain enough information for the reader to understand its contents. The title should explain the subject of the table, how the data are classified, the time period, or other related matters. A subtitle is sometimes included under the title to explain something about the table; most often this is a statement of the measurement units in which the data are expressed. The contents of the columns should be clearly identified by the column heads, and the contents of the stub should do the same for the rows. The body of the table contains the data, while the footnotes contain any needed explanations. Footnotes should be identified by letters or symbols such as asterisks, rather than by numbers, to avoid confusion with data values. Finally, there should be a source note if the data do not come from your original research. Exhibit 21-5 illustrates the various parts of a table.

Graphics

Compared with tables, graphs show less information and often only approximate values. However, they are more often read and remembered than tables. Their great advantage is that they convey quantitative values and comparisons more readily than tables. With personal computer charting programs, you can easily turn a set of numbers into a chart or graph.

> Exhibit 21-5 Sample Tabular Findings

Internet Access and Online Service Usage (2000)* — Title

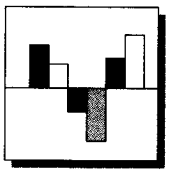
Item	Total adults	Any online Internet usage	Have Internet access: Home or work	Have Internet access: Home only	Have Internet access: Work only	Used any online service in the past 30 days
Total Adults (1,000)	199,438	90,458	112,949	77,621	50,476	75,409
Gender						
Male	48.0	49.8	48.5	49.3	52.3	49.3
Female	52.0	50.2	51.5	50.7	47.7	50.7
Marital Status						
Single	23.7	27.5	26.0	23.4	22.6	28.4
Married	57.2	61.6	61.1	66.2	65.3	60.6
Other	19.1	10.9	12.9	10.3	12.0	10.9
Household Income						
Less than $50,000	55.1	33.6	38.3	29.9	23.3	32.9
$50,000 to $74,000	20.7	26.2	25.7	26.9	27.4	26.0
$75,000 to $149,999	20.1	32.6	29.4	34.7	39.6	33.1
$150,000 or more	4.1	7.6	6.7	8.5	9.7	8.0

Banner — Column Heads — Stub — Body

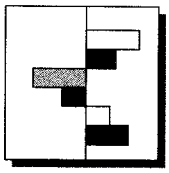
*For persons 18 years of age or older (199,438). As of spring. Based on sample and subject to sampling error, see source for details. — Footnote

Source: Mediamark Research, Inc., New York, NY, CyberStats, © Spring 2000, internet site http://www.mediamark.com (accessed 23 May 2000). — Source Note

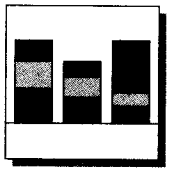
> Exhibit 21-6 Guide to Graphs



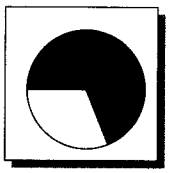
Column Compares sizes and amounts of categories usually for the same time. Places categories on *X* axis and values on *Y* axis.



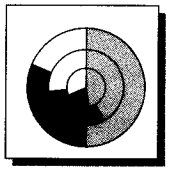
Bar Same as the column but positions categories on *Y* axis and values on *X* axis. Deviations, when used, distinguish positive from negative values.



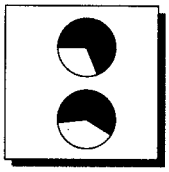
Stacked Bar In either bar or column, shows how components contribute to the total of the category.



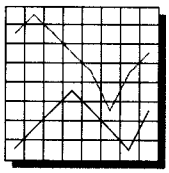
Pie Shows relationship of parts to the whole. Wedges are row values of data.



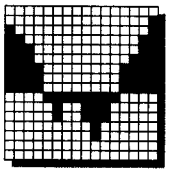
Stacked Pie Same as pie but displays two or more data series.



Multiple Pie Uses same data as stacked pie but plots separate pies for each column of data without stacking.

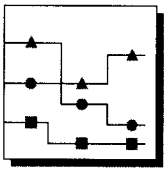


Line Compares values over time to show changes in trends.

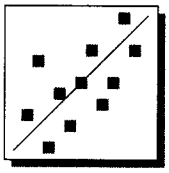


Filled Line Similar to line chart, but uses fill to highlight series.

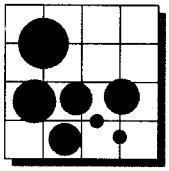
Area (surface) Like line chart, compares changing values but emphasizes relative value of each series.



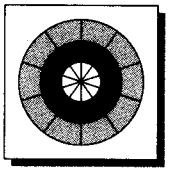
Step Compares discrete points on the value axis with vertical lines showing difference between points. Not for showing a trend.



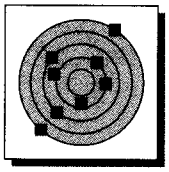
Scatter Shows if relationship between variables follows a pattern. May be used with one variable at different times.



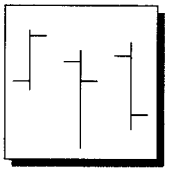
Bubble Used to introduce third variable (dots of different sizes). Axes could be sales, profits; bubbles are assets.



Spider (and Radar) Radiating lines are categories; values are distances from center (shows multiple variables—e.g., performance, ratings, progress).

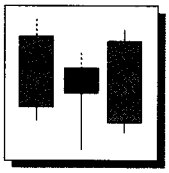


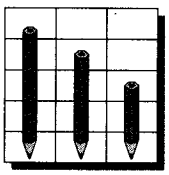
Polar Shows relationship between a variable and angle measured in degrees (cyclical trends, pollution source vs. wind direction, etc.).



Open Hi Lo Close Shows fluctuating values in a given period (hour, day). Often used for investments.

Boxplots Displays distribution(s) and compares characteristics of shape (Chapter 17).





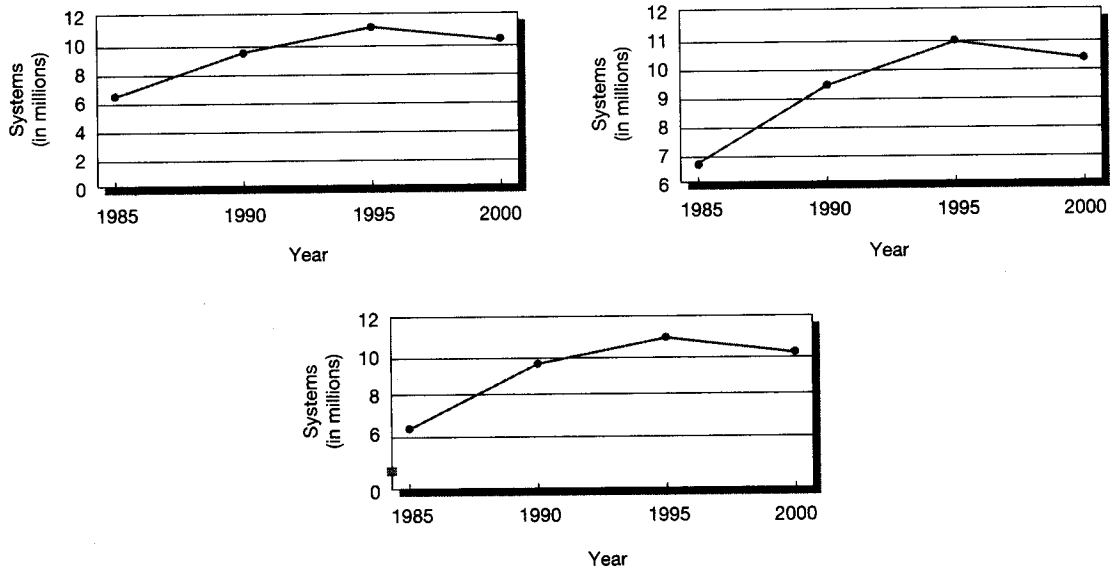
Pictographic Special chart that uses pictures or graphic elements in lieu of bars.

There are many different graphic forms. Exhibit 21-6 shows the most common ones and how they should be used. Statistical explanation charts such as boxplots, stem-and-leaf displays, and histograms were discussed in Chapter 17. Line graphs; area, pie, and bar charts; and pictographs and 3-D graphics receive additional attention here.

Line Graphs

Line graphs are used chiefly for time series and frequency distribution. There are several guidelines for designing a line graph:

> Exhibit 21-7 Cable TV Systems and Subscribers, 1985–2000



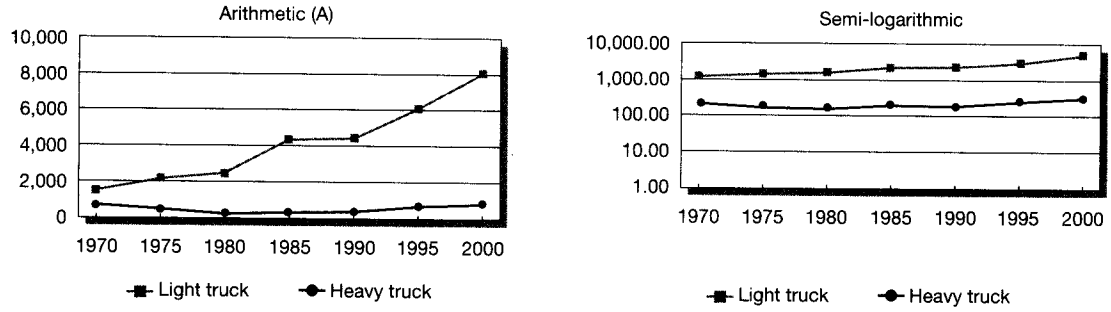
- Put the time units or the independent variable on the horizontal axis.
- When showing more than one line, use different line types (solid, dashed, dotted, dash-dot) to enable the reader to easily distinguish among them.
- Try not to put more than four lines on one chart.
- Use a solid line for the primary data.

It is important to be aware of perceptual problems with line diagrams. The first is the use of a zero baseline. Since the length of the bar or distance above the baseline indicates the statistic, it is important that graphs give accurate visual impressions of values. A good way to achieve this is to include a zero baseline on the scale on which the curves are plotted. To set the base at some other value is to introduce a visual bias. This can be seen by comparing the visual impressions in parts A and B of Exhibit 21-7. Both are accurate plots of cable television systems in the United States from 1985 through 2000. In part A, however, using the baseline of zero places the curve well up on the chart and gives a better perception of the relation between the absolute size of cable systems and the changes on a five-year interval. The graph in part B, with a baseline at 6 million, can easily give the impression that the growth was at a more rapid rate. When space or other reasons dictate using shortened scales, the zero base point should still be used but with a break in the scale as shown in part C of Exhibit 21-7. This will warn the reader that the scale has been reduced.

The balance of size between vertical and horizontal scales also affects the reader's impression of the data. There is no single solution to this problem, but the results can be seen by comparing parts B and C in Exhibit 21-7. In part C, the horizontal scale is twice that in part B. This changes the slope of the curve, creating a different perception of growth rate.

A third distortion with line diagrams occurs when relative and absolute changes among two or more sets of data are shown. In most charts, we use arithmetic scales, where each space unit has identical value. This shows the absolute differences between variables, as in part A of Exhibit 21-8, which presents the light- and heavy-truck sales in the United States from 1970 to 2000. This is an arithmetically correct way to present these data; but if we are interested in rates of growth, the visual impressions from a semi-logarithmic scale are more accurate. A semi-logarithmic scale uses a logarithm along one axis (usually the vertical or *Y* axis) and an arithmetic scale along the other axis (usually the horizontal or *X* axis). The *Y* axis shows quantity, and

> Exhibit 21-8 U.S. Truck Sales 1970–2000 (in thousands)



Sales	1970	1975	1980	1985	1990	1995	2000
Heavy truck	337.0	298.0	271.0	295.0	298.0	428.0	578.0
Light truck	1408.0	2052.0	2215.0	4446.0	4550.0	6053.0	8386.0

Percent Growth in Sales

	1980–85	1985–90	1990-95	1995-2000	1990-2000
HT	8.9	1.0	43.6	35.0	94.0
LT	100.7	2.3	33.0	38.5	84.3

Source: Data were extracted from Michigan Senate, http://www.senate.state.mi.us/sfa/Economics/RetailAutoSales.PDF, January 15, 2003.

the *X* axis shows time. Arithmetic data are converted to natural logs by spreadsheet or statistical software and plotted. Semi-logarithmic graphics preserve percentage relationships across the scale.

A comparison of the line diagrams in parts A and B of Exhibit 21-8 shows how much difference a semi-logarithmic scale makes. Each is valuable, and each can be misleading. In part A, notice that sales of both light and heavy trucks have grown since 1970 but heavy-truck sales are only a small segment of U.S. sales of trucks and have a much flatter growth curve. One can even estimate what this proportion is. Part B gives insight into growth rates that are not clear from the arithmetic scale. It shows that while light trucks had a major growth spurt between 1980 and 1985, a spurt not shared by heavy trucks, since then their growth patterns have been more consistent with each other. From the calculated growth rate, in two of the last four five-year periods examined, the growth in heavy-truck sales actually exceeded the growth in light-truck sales, even while light-truck sales far exceeded heavy-truck sales.

Area (Stratum or Surface) Charts

An **area chart** is also used for a time series. Consisting of a line that has been divided into component parts, it is best used to show changes in patterns over time. The same rules apply to stratum charts as to line charts (see Exhibit 21-9).

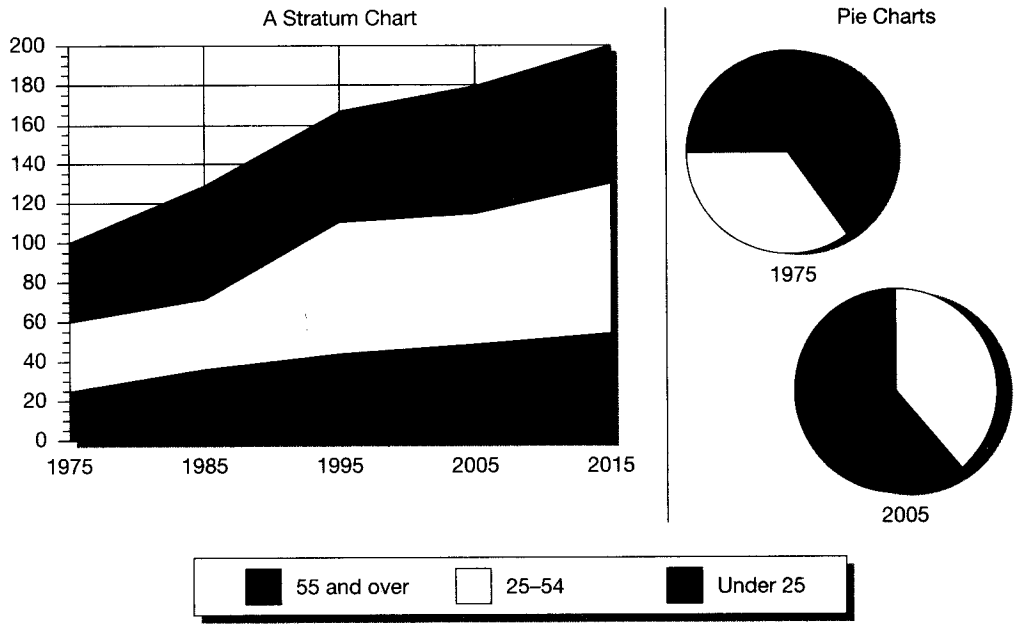
Pie Charts

Pie charts are another form of area chart. They are often used with business data. However, they can easily mislead the reader or be improperly prepared. Research shows that readers' perceptions of the percentages represented by the pie slices are consistently inaccurate.[9] Consider the following suggestions when designing pie charts:

- Show 100 percent of the subject being graphed.
- Always label the slices with "call-outs" and with the percentage or amount that is represented. This allows you to dispense with a legend.

> Exhibit 21-9 Examples of Area Charts: A Stratum Chart and Two Pies

Notice hat the two pie charts seem to indicate a decrease in the "under 25" category relative to the stratum chart. The "under 25" category did in fact decrease (from 40 to 33 percent) but not as dramatically as the stratum to pie comparison would suggest. Also note that the sample size changed from 100 to 180 units between 1975 and 2005. It is important not to use a pie chart alone in a time series, to avoid giving erroneous impressions.



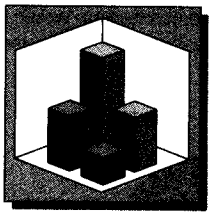
- Put the largest slice at twelve o'clock and move clockwise in descending order.
- Use light colors for large slices, darker colors for smaller slices.
- In a pie chart of black and white slices, a single red one will command the most attention and be memorable. Use it to communicate your most important message.[10]
- Do not show evolution over time with pie charts as the only medium. Since pie charts always represent 100 percent, growth of the overall whole will not be recognized. If you must use a series of pie charts, complement them with an area chart.

As shown in Exhibit 21-9, pie charts portray frequency data in interesting ways. In addition, they can be stacked to show relationships between two sets of data.

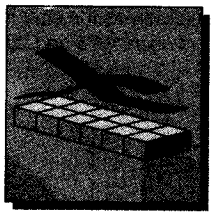
Bar Charts

Bar charts can be very effective if properly constructed. Use the horizontal axis to represent time and the vertical axis to represent units or growth-related variables. Vertical bars are generally used for time series and for quantitative classifications. Horizontal bars are less often used. If neither variable is time-related, either format can be used. A computer charting program (e.g., Excel, the newest version of SPSS) easily generates charts. If you are preparing a bar chart by hand, leave space between the bars equal to at least half the width of the bar. An exception to this is the specialized chart—the histogram—where continuous data are grouped into intervals for a frequency distribution (see Chapter 17). A second exception is the multiple-variable chart, where more than one bar is located at a particular time segment. In this case, the space between the groups of bars is at least half the width of the group. Bar charts come in a variety of patterns. In Chapter 17, Exhibit 17-3 shows a standard vertical bar graph. Variations are illustrated in Exhibit 21-6.

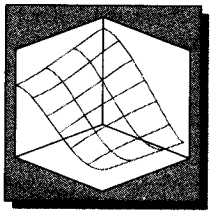
> Exhibit 21-10 3-D Charts



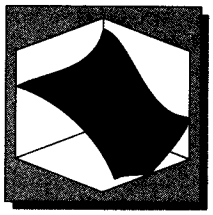
3-D Column
A variation on column charts, they compare variables to each other or over time. Axes: *X* = categories, *Y* = series, *Z* = values. Other variations include 3-D area charts and connect-the-dots scatter charts.



3-D Ribbon This example is a one-wall plot showing columns of data (series) as ribbons. One or more columns are used. Axes: *X* = categories, *Y* = series, *Z* = values.



3-D Wireframe
A variation of a contour or response surface; suitable for changes in time and multivariate data. Axes: *X* = categories, *Y* = series, *Z* = values.



3-D Surface Line
Handles three columns of data and plots *XYZ* coordinates to show a response surface. Helpful for multivariate applications.

Pictographs and Geographs

These graphics are used in popular magazines and newspapers because they are eye-catching and imaginative. *USA Today* and a host of imitators are often guilty of taking this to the extreme, creating graphs that are incomprehensible. A **pictograph** uses pictorial symbols (an oil drum for barrels of oil, a stick figure for numbers of employees, or a pine tree for amount of wood). The symbols represent data volume and are used instead of a bar in a bar-type chart. It is proper to stack same-size images to express more of a quantity and to show fractions of an image to show less. But altering the scale of the symbol produces problems. Since the pictures represent actual objects, doubling the size will increase the area of the symbol by four (and the volume by more). This misleads the reader into believing the increase is larger than it really is. The exception is a graphic that is easily substituted for a bar, such as the pencils in Exhibit 21-6.

Geographic charts use a portion of the world's map, in pictorial form, to show variations in regional data. They can be used for product sales, distribution status, media consumption, promotional response rates, per capita rates of consumption, demographics, or any of a number of other geographically specific variables.

Stacked data sets produce variables of interest that can be aligned on a common geographic referent. The resulting pictorial display allows the user to "drill" through the layers and visualize the relationships. With better Windows-based software and government agencies providing geo-codes and reference points, geographic spatial displays are becoming a more common form of graphic.

< See the example of mapped data in Chapter 17, p. 483.

3-D Graphics

With current charting techniques, virtually all charts can now be made three-dimensional. Although a **3-D graphic** adds interest, it can also obscure data. Care must be used in selecting 3-D chart candidates (see Exhibit 21-10). Don't confuse pie and bar charts that have achieved dimensionality simply by adding depth to the graphics; this is not 3-D. A 3-D column chart allows you to compare three or more variables from the sample in one bar chart–type graph. If you want to display several quarters of sales results for Hertz, Avis, Budget, and National, you have 3-D data. Surface charts and 3-D scatter charts are helpful for displaying complex data patterns if the underlying distributions are multivariate. Finally, be careful about converting line charts to ribbon charts, and area charts to 3-D area charts; these can be hard for a novice to read and your primary objective in graphical presentation is always data clarity.

An internal, informal oral report of research findings (and often findings in process) is often a lively, interactive exchange of information. The researcher supports the discussion by sharing preliminary graphical and tabular displays of data and initial conclusions.

> Oral Presentations

Researchers often present their findings orally. Such a presentation, sometimes called a **briefing,** has some unique characteristics that distinguish it from most other kinds of public speaking: Only a small group of people is involved; statistics normally constitute an important portion of the topic; the audience members are usually managers with an interest in the topic, but they want to hear only the critical elements; speaking time will often be as short as 20 minutes but may run longer than an hour; and the presentation is normally followed by questions and discussion.

Preparation

A successful briefing typically requires condensing a lengthy and complex body of information. Since speaking rates should not exceed 100 to 150 words per minute, a 20-minute presentation limits you to about 2,000 to 3,000 words. If you are to communicate effectively under such conditions, you must plan carefully. Begin by asking two questions. First, how long should you plan to talk? Usually there is an indication of the acceptable presentation length. It may be the custom in an organization to take a given allotted time for a briefing. If the time is severely limited, then the need for topical priorities is obvious. This leads to the second question: What are the purposes of the briefing? Is it to raise concern about problems that have been uncovered? Is it to add to the knowledge of audience members? Is it to give them conclusions and recommendations for their decision making? Questions such as these illustrate the general objectives of the report. After answering these questions, you should develop a detailed outline of what you are going to say. Such an outline should contain the following major parts:

1. *Opening.* A brief statement, probably not more than 10 percent of the allotted time, sets the stage for the body of the report. The opening should be direct, get attention, and introduce the nature of the discussion that follows. It should explain the nature of the project, how it came about, and what it attempted to do.

>snapshot

The Culture of Reporting

One of the few universally followed rules in presenting research results is to craft the message to fit the client. When the Team One/Lexus team ventured to Japan to share their early research findings, they knew they had to deliver any negatives with a polite, highly sensitive approach. The news was good. But to engineers who had crafted the Lexus SC 430 to be twice as good as the Jaguar XK8—more comfortable, quieter, and easier to handle—some of the findings would be puzzling. The team had held three static product clinics—where more than 250 luxury buyers were assembled to compare, but not drive, the Lexus SC 430 and its competitors. Shortly thereafter they had conducted numerous focus groups of the top tier of these interested luxury buyers, known as *acceptors*. Among the early findings the team learned that buyers expected the car to growl when the accelerator was depressed, to show exhaust, and to handle more like a sports car. "Culturally, Japanese engineers have come to see themselves—and with justification—as entitled to make a car the way a car should be made," shared Arian Barrow, account manager for Lexus at Team One Advertising. This made telling them what they would consider negatives somewhat difficult. For example, buyers' expectations were that the car would zoom from zero to 60 in under five seconds, not arrive there in eight or nine seconds. "So we found ourselves sharing results in a less hard-hitting way than we would with a different client." How did they deliver the unexpected news? "People loved the car! But they would love it even more if it would go from zero to 60 in five seconds!"

www.teamoneadv.com; www.lexus.com.

2. *Findings and conclusions.* The conclusions may be stated immediately after the opening remarks, with each conclusion followed by the findings that support it.
3. *Recommendations.* Where appropriate, these are stated in the third stage; each recommendation may be followed by references to the conclusions leading to it. Presented in this manner, they provide a natural climax to the report. At the end of the presentation, it may be appropriate to call for questions from the audience.

Early in the planning stage you need to make two further decisions. The first concerns the type of audiovisuals (AVs) that will be used and the role they will play in the presentation. AV decisions are important enough that they are often made *before* the briefing outline and text are developed.

Presenting your research findings using PowerPoint™ or other presentation software requires preparation similar to presenting with nonelectronic visual aids. The researcher must still determine his or her style of presentation, the order of findings, and which findings will be presented graphically, in tabular format, or verbally. As most visual aids are prepared using computer software, the key hyperlink files are already available. It might seem as though the presenter could bypass the costly printing of visual aids, which can be a time-consuming task. However, the electronic presenter must have a contingency plan for a malfunctioning computer. Color transparencies are the low-tech backup but clearly don't allow the full range of possibilities that electronic hyperlinks afford. Having a second laptop and projection system, as well as multiprong power cords and spare computer connection cords, is the usual high-tech insurance plan. The same general rule applied to all presentations is critical for electronic ones—practice, practice, practice—but a caveat is added: Practice *with your equipment* so that movement between files, hyperlinks, and your PowerPoint™ presentation seems effortless.

The second decision you must make as you plan for your presentation is what type it will be. Will it be memorized, read from your manuscript, or given extemporaneously? We rule out the impromptu briefing because impromptu speaking does not involve preparation. Your reputation and the research effort should not be jeopardized by "winging it."

Memorization is a risky and time-consuming course to follow. Any memory slip during the presentation can be a catastrophe, and the delivery sounds stilted and distant. Memorization virtually precludes establishing rap-

port with the audience members and adapting to their reactions while you speak. It produces a self- or speaker-centered approach and is not recommended.

Reading a manuscript is also not advisable, even though many professors seem to reward students who do so (perhaps because they themselves get away with it at professional meetings). The delivery sounds dull and lifeless because most people are not trained to read aloud, and therefore they do it badly. They become focused on the manuscript to the exclusion of the audience. This head-down preoccupation with the text is clearly inappropriate for management presentations.

The **extemporaneous presentation** is audience-centered and made from minimal notes or an outline. This mode permits the speaker to be natural, conversational, and flexible. Clearly, it is the best choice for an organizational setting. Preparation consists of writing a draft along with a complete sentence outline and converting the main points to notes. In this way, you can try lines of argument, experiment with various ways of expressing thoughts, and develop phraseology. Along the way, the main points are fixed sequentially in your mind, and supporting connections are made.

Audiences accept speaker notes, and their presence does wonders in allaying speaker fears. Even if you never use them, they are there for psychological support. Many prefer to use 5-by-8-inch cards for their briefing notes because they hold more information and so require less shuffling than the smaller 3-by-5-inch size. Card contents vary widely, but here are some general guidelines for their design:

- Place title and preliminary remarks on the first card.
- Use each of the remaining cards to carry a major section of the presentation. The amount of detail depends on the need for precision and the speaker's desire for supporting information.
- Include key phrases, illustrations, statistics, dates, and pronunciation guides for difficult words. Include participant quotations and ideas that bear repeating.
- Along the margin, place instructions and cues, such as SLOW, FAST, EMPHASIZE, TRANSPARENCY A, TURN CHART, and GO BACK TO CHART 3.
- Sequentially number your cards or notes, so you can return them quickly to order if they are accidentally shuffled.

After the outline and the AV aids comes the final stage of preparation—the rehearsal. Rehearsal, a prerequisite to effective briefing, is *too often slighted,* especially by inexperienced speakers. Giving a briefing is an artistic performance, and nothing improves it more than for the speaker to demonstrate mastery of the art. First rehearsal efforts should concentrate on those parts of the presentation that are awkward or poorly developed. After the problem areas have been worked out, there should be at least a few full-scale practices under simulated presentation conditions. All parts should be timed and edited until the time target is met. A video recorder is an excellent diagnostic tool.

Delivery

While the content of a report is the chief concern, the speaker's delivery is also important. A polished presentation adds to the receptiveness of the audience, but there is some danger that the presentation may overpower the message. Fortunately, the typical research audience knows why it is assembled, has a high level of interest, and does not need to be entertained. Even so, the speaker faces a real challenge in communicating effectively. The delivery should be restrained. Demeanor, posture, dress, and total appearance should be appropriate for the occasion. Speed of speech, clarity of enunciation, pauses, and gestures all play their part. Voice pitch, tone quality, and inflections are proper subjects for concern. There is little time for anecdotes and other rapport-developing techniques, yet the speaker must get and hold audience attention.

>snapshot

Overcoming the Jitters

The fear of public speaking ranks up there with the fear of death and/or public nudity. Whether you are a seasoned pro or this is your first speech, stage fright, the illogical fear of facing an audience, can be a paralyzing emotion. How do you handle those times when your mind starts going blank and your stomach is turning? Patricia Fripp, an award-winning keynote speaker and speech coach, provides some answers. She suggests that you "need to anticipate your speech mentally, physically, and logistically." Mental preparation is key and should be a six-to-one ratio: Invest three hours of preparation for a 30-minute speech. There is no substitute for rehearsal. Spend some time memorizing your opening and closing—three or four sentences each. Although you may speak from notes, knowing your opening and closing helps your fluency, allowing you to make the vital connection in rapport with your audience when you are likely to be most nervous.

Logistically, know the room. Go there as early as possible to get comfortable in the environment. Practice using the microphone and check the equipment. A quick review of your visual aids is also helpful. Then, during the presentation, you can focus on your audience and not be concerned with the environment.

The physical part of overcoming nervousness is varied and may be constrained by your setting. In a small-group setting, shake hands, exchange greetings, and make eye contact with everybody beforehand. In a larger meeting, at least connect with the people in the front row. Do so sincerely, and they'll be cheering for your success. They are not waiting for you to fail—they are far too worried about themselves—and they are there to listen to you. If possible, avoid sitting while you're waiting to speak. Find a position in the room where you can stand occasionally. The rear of the room gives you access to the bathroom and drinking fountain.

If your anxiety level is still high, then you need an outlet for your energy. Comedians and actors find that doing light exercises in their dressing rooms or in another private area can relieve the excess energy. Fripp adds, "Find a private spot, and wave your hands in the air. Relax your jaw, and shake your head from side to side. Then shake your legs one at a time. Physically shake the tension out of your body." The object is to release enough nervous energy to calm your anxieties—without becoming so stress-free that you forget your purpose and audience.

www.fripp.com

Speaker Problems

Inexperienced speakers have many difficulties in making presentations. They often are nervous at the start of a presentation and may even find breathing difficult. This is natural and should not be of undue concern. It may help to take a deep breath or two, holding each for a brief time before exhaling as fully as possible. This can be done inconspicuously on the way to the podium.

Several characteristics of inexperienced speakers may be summarized as questions. Even if you are an accomplished speaker, it is helpful to review them as you watch a video of your presentation.

1. *Vocal characteristics:*
   a. Do you speak so softly that someone cannot hear you well? It is helpful to have someone in the back of the room who can signal if your voice is not carrying far enough.
   b. Do you speak too rapidly? Remind yourself to slow down. Make deliberate pauses before sentences. Speak words with precision without exaggerating. However, some people talk too slowly, and this can make the audience restive.
   c. Do you vary volume, tone quality, and rate of speaking? Any of these can be used successfully to add interest to the message and engage audience attention. Speakers should not let their words trail off as they complete a sentence.
   d. Do you use overworked pet phrases, repeated *uhs, you know,* and *in other words?*
2. *Physical characteristics:*
   a. Do you rock back and forth, roll or twist from side to side, or lean too much on the lectern?

b. Do you hitch or tug on clothing, scratch, or fiddle with pocket change, keys, pencils, or other devices?

c. Do you stare into space? Lack of eye contact is particularly bothersome to listeners and is common with inexperienced speakers. Many seem to choose a spot above the heads of the audience and continue to stare at this spot except when looking at notes. *Eye contact is important.* Audience members need to feel that you are looking at them. It may be helpful to pick out three people in the audience (left, right, and center) and practice looking at them successively as you talk.

d. Do you misuse visuals by fumbling or putting them on in incorrect order or upside down? Do you turn your back to the audience to read from visuals?

Audiovisuals

Researchers can use a variety of AV media with good results. While there is need for computer-assisted media in many business applications, they will be mentioned here only briefly. Our emphasis is on visual aids that are relatively simple and inexpensive to make.

Low Tech

1. *Chalkboards and whiteboards.* Chalkboards are flexible and inexpensive, and they require little specific preparation. On the other hand, they are not novel and do not project a polished appearance. Whiteboards, both portable and installed, provide visual relief, particularly when color markers are used. Both varieties reduce speaking time while the speaker is writing. If you use either, write legibly or print, leave space between lines, and do not talk to the board with the audience to your back. If you are in an unfamiliar room, it is best to arrive prepared with erasable markers (or chalk) and erasure materials.
2. *Handout materials.* These are inexpensive but can have a professional look if done carefully. Hand outs can include pictures and graphic materials that might be difficult to display otherwise. The disadvantages include the time needed to produce them and their distracting impact if not properly used. You may distribute them when the audience leaves, but a better use is to refer to them during your talk. If you use them this way, *do not hand them out until you are ready to refer to them.*
3. *Flip charts.* You can show color, pictures, and large letters with these. They are easy and inexpensive to make; they can focus listener attention on a specific idea. If not well made, they can be distracting. Unless they are large, they should be restricted to small groups and to types of material that can be summarized in a few words.
4. *Overhead transparencies.* These may be of different sizes, but the most common is about the same as an 8½-by-11-inch page. They are easily made with color markers or with a copy machine. Computer graphics can be plotted or printed directly to transparencies for a more accurate and professional look. Multiple-color and single-color renditions are available. You can also show overlays and buildups. In using transparencies, be sure they are in correct order and right side up when you place them on the projector.
5. *Slides.* Most slides are 35mm, but larger sizes are sometimes used. They are relatively inexpensive and colorful and present a professional-looking image if done well. They are somewhat more difficult to make but can be prepared with a personal computer and slide-construction software.

High Tech

6. *Computer-drawn visuals.* For transparencies and slides, the draw and paint programs for personal computers provide the presenter with limitless options for illustrating the message. Stored visuals can be teamed with a device for projecting the computer output to a screen, or the briefer can use the soft-

As technology advances, the Internet has become a medium for oral presentations and videoconferences. As with other presentations, you need to be cautious with equipment and look for software glitches. Have a backup copy of your presentation on your laptop or your company's server. Test your external mouse as well as the one that is connected to your computer. Be certain that your screensavers are disabled. And most important, be prepared to give your presentation even if the technology fails.

ware to create the image at the moment a question is asked or a demonstration is appropriate. Be careful that the technology does not distract from the purpose of the message.

7. *Computer animation.* The development of larger and faster processors, memory chips, and disks has made it possible to store voice and image data in quantity in personal computers. Technology permits multimedia presentations using videotape, videodisc, and CD-ROM elements that are integrated for the ultimate in image reproduction. For proposals, large contracts, or other business applications, the preparation and expense may be justifiable.

The choice of visual aids is determined by your intended purpose, the size of the audience, meeting room conditions, time and budget constraints, and available equipment.

Visual aids serve the presenter of a research presentation in several ways. They make it possible to present materials that cannot otherwise be communicated effectively. Statistical relationships are difficult to describe verbally, but a picture or graph communicates well. How better to describe some object or material than to show it or picture it?

Visual aids help the speaker to clarify major points. With visual reinforcement of a verbal statement, the speaker can stress the importance of points. In addition, the use of two channels of communication (hearing and sight) enhances the probability that the listener will understand and remember the message.

The continuity and memorability of the speaker's message are also improved with visual aids. Verbal information is so transient that any slight lapse of listener attention results in losing the information thread. The failure to fully comprehend a given point cannot be remedied by going back to hear it again, for the speaker has gone on. With a visual aid, however, there is more opportunity to review this point, relate it to earlier comments by the speaker, and improve retention.

>summary

1 A quality presentation of research findings can have an inordinate effect on a reader's or a listener's perceptions of a study's quality. Recognition of this fact should prompt a researcher to make a special effort to communicate skillfully and clearly.

2 Research reports contain findings, analysis, interpretations, conclusions, and sometimes recommendations. They may follow the short, informal format typical of memoranda and letters, or they may be longer and more complex. Long reports are of either a technical or a management type. In the former, the problem is presented and followed by the findings, conclusions, and recommendations. In the management report, the conclusions and recommendations precede the findings. The technical report is targeted at the technically trained reader; the management report is intended for the manager-client.

3 The writer of research reports should be guided by four questions:

- What is the purpose of this report?
- Who will read it?
- What are the circumstances and limitations under which it is written?
- How will the report be used?

Reports should be clearly organized, physically inviting, and easy to read. Writers can achieve these goals if they are careful with mechanical details, writing style, and comprehensibility.

4 There is a special challenge to presenting statistical data. While some of these data may be incorporated in the text, most statistics should be placed in tables, charts, or graphs. The choice of a table, chart, or graph depends on the specific data and presentation purpose.

5 Oral presentations of research findings are common and should be developed with concern for the communication problems that are unique to such settings. Briefings are usually conducted under time constraints; good briefings require careful organization and preparation. Visual aids are a particularly important aspect of briefings but are too often ignored or treated inadequately.

Whether written or oral, poor presentations do a grave injustice to what might otherwise be excellent research. Good presentations, on the other hand, add luster to both the research and the reputation of the researcher.

>keyterms

area chart 636
bar chart 637
briefing 639
executive summary 610
extemporaneous presentation 641
geographic chart 638
letter of transmittal 610
line graph 634
management report 607
pace 618
pictograph 638
pie chart 636
readability index 618
sentence outline 616
technical report 607
3-D graphic 638
topic outline 616

>discussionquestions

Terms in Review

1 Distinguish between the following:

a Speaker-centered presentation and extemporaneous presentation.

b Technical report and management report.

c Topic outline and sentence outline.

Making Research Decisions

2 What should you do about each of these?

a Putting information in a research report concerning the study's limitations.

b The size and complexity of tables in a research report.

c The physical presentation of a report.

d Pace in your writing.

3 What type of report would you suggest be written in each of the following cases?

a The president of the company has asked for a study of the company's pension plan and its comparison to the plans of other firms in the industry.

b You have been asked to write up a marketing experiment, which you recently completed, for submission to the *Journal of Marketing Research.*

c Your division manager has asked you to prepare a forecast of promotional budget needs for the division for the next 12 months.

d The National Institutes of Health has given you a grant to study the relationship between advertising of prescription drugs and subsequent sales of those drugs.

4 There are a number of graphic presentation forms. Which would you recommend to show each of the following? Why?

a A comparison of changes in average annual per capita income for the United States and Japan from 1990 to 2000.

b The percentage composition of average family expenditure patterns, by the major types of expenditures, for families whose heads are under age 35 compared with families whose heads are 55 or older.

c A comparison of the changes in charitable giving between December 31, 2000, and December 31, 2004.

5 Outline a set of visual aids that you might use in an oral briefing on these topics:

a How to write a research report.

b The outlook for the economy over the next year.

c The major analytical article in the latest issue of *BusinessWeek.*

From Concept to Practice

6 Use Exhibit 21-2 and plan the structure of your course project or of a research study you have read about in one of the Snapshots in this text or Cases on the CD.

7 Choose any case containing data on your text CD and prepare a findings page, similar to the one in Exhibit 21-3.

>wwwexercises

1 Visit Presentations.com **(www.presentations.com)** and navigate the site to find an article on using technology in presenting or building a clear presentation. How might the tips within the article help you with your project presentation?

2 Visit the Henry J. Kaiser Family Foundation Web site **(www.kff.org),** and study the layout of one of the written reports. Choose one statistical presentation and determine alternative ways the data could be presented.

3 Find a Web site that compares APA and MLA citation styles. Which is most appropriate for the type of report you are preparing for your class project? (Hint: Both Columbia University and Bedford/St.Martins have excellent sites.)

>cases*

Inquiring Minds Want to Know—WOW!

Mastering Teacher Leadership

NCRCC: Teeing Up and New Strategic Direction

* All cases appear on the text CD; you will find abstracts of these cases in the Case Abstracts section of this text. Video cases are indicated with a video icon.

>case abstracts

A GEM of a Study

AgriComp

AIDS Rates for Females

BBQ Product Crosses Over the Lines of Varied Tastes

Calling Up Attendance

Campbell-Ewald Pumps Awareness into the American Heart Association

Campbell-Ewald: R-E-S-P-E-C-T Spells Loyalty

Can Research Rescue the Red Cross?

Can This Study Be Saved?

Donatos: Finding the New Pizza

Healthy Lifestyles

HeroBuilders.com

HiTech Engineering

Inquiring Minds Want to Know—NOW!

Mastering Teacher Leadership

Match Wits with Jason on Sampling Theory

McDonald's Tests Catfish Sandwich

Medical Laboratories

NCRCC: Teeing Up a New Strategic Direction

NetConversions Influences Kelley Blue Book

Open Doors: Extending Hospitality to Travelers with Disabilities

Overdue Bills

Performance Evaluations

Ramada Demonstrates Its *Personal Best*™

Retailers Unhappy with Displays from Manufacturers

Rubbergate

Starbucks, Bank One, and Visa Launch Starbucks Card Duetto™ Visa

State Farm: Dangerous Intersections

Sturgel Division

The Brazing Operation

The Catalyst for Women in Financial Services

T-Shirt Designs

USTA: Come Out Swinging

Violence on TV

Volkswagen's Beetle

Waste Paper

Xerox Abuses

Yahoo!: *Consumer Direct* Marries Purchase Metrics to Banner Ads

> A GEM of a Study

The Global Entrepreneurship Monitor Entrepreneurial Assessment, a joint project of the Kauffman Center for Entrepreneurship Leadership at Babson College and the London Business School, has undertaken a long-term, large-scale project to prove the causal links between a government's economic policies and initiatives, the resulting entrepreneurial activity, and subsequent economic growth. This case describes multiple-stage research, including thousands of interviews in several countries by established research firms.

> AgriComp

AgriComp, a supplier of computer systems for farmers, has surveyed its dealers on whether to change its procedure for settling warranty claim disputes. Currently local dealers handle warranty services for customers via local repair followed by a reimbursement claim to AgriComp. Denied claims follow an internal company appeal process. Dealers have been complaining about the fairness of the appeal process and in a recent survey were asked to respond to an alternative process, an impartial mediator. The student is asked to review survey results and determine whether the costly external mediator process would be worth implementing to keep the dealers happy.

> AIDS Rates for Females

In the early 1980s, AIDS was not generally considered a big issue for women. The student is asked to examine 1991 data from the U.S. Department of Health and Human Services to present summary data that will reveal if this was the case a decade later and to highlight salient features or any important trends. Case contains a data table.

> BBQ Product Crosses Over the Lines of Varied Tastes

This case asks students to assess measurement and scaling issues in the context of the introduction of a frozen, microwaveable BBQ product line into the Southeast by Rich Products, Buffalo, New York. Rich is a manufacturer of bakery and barbeque products for the food service and retail sectors of the food market. The new line is being introduced with commercials depicting Ruby, a fictitious waitress at Pork-O-Rama, who prefers the taste of the new frozen line. **www.richs.com**

> Calling Up Attendance

This case examines a study by Prince Marketing for TCS Management Group. TCS Management Group, Inc., part of Aspect Communications, is the leading provider of workforce management software, especially related to call center management. The study discusses measures of customer satisfaction and aims to predict attendance at a two-day educational event, Users Forum. **www.aspect.com**

> Campbell-Ewald Pumps Awareness into the American Heart Association

You wouldn't think that an organization that does as much good as the American Heart Association would have low awareness, but at the start of the described research program its unaided awareness level was just 16 percent. For a company reliant on contributions, low awareness is a major problem. This case profiles the research behind the American Heart Association's first-ever paid advertising campaign. **www.campbell-ewald.com; www.americanheart.org**

> Campbell-Ewald: R-E-S-P-E-C-T Spells Loyalty

Campbell-Ewald, the Detroit-based marketing communications company, part of the global Interpublic Group of Companies, is an award-winning consultancy. This case describes the research behind its effort to measure and improve customer loyalty and the development of its five respect principles that lead to enhanced customer commitment.
www.campbellewald.com

> Can Research Rescue the Red Cross?

The American Red Cross seemed in its true element following September 11, 2001. It was flooded with donations to do its highly needed and regarded work. Most of those donations went to its Liberty Fund. But shortly after it started to disperse the funds, the media began asking questions. And the American Red Cross soon wore a patina of tarnish. Learn about the research that evaluated Americans' perception of the Red Cross and how research by Wirthlin Worldwide helped craft a new and highly effective donation solicitation process. **www.wirthlin.com; www.redcross.org**

> Can This Study Be Saved?

This case depicts a discussion between individuals who are trying to assess the quality of research based on the sampling procedure and the results based on the sampling process. It asks the student to evaluate the sampling process and make recommendations to use the collected data or resample. Data table is included in the case.

> Donatos: Finding the New Pizza

The pizza segment of the fast-food industry is very aggressive. As people's tastes change and new diets become the rage, restaurant chains must decide if and how to respond. This case focuses on the research behind the introduction of Donato's low-carbohydrate pizza and how the company collapsed its normal product-development research process to take advantage of a current trend. **www.donatos.com**

> Healthy Lifestyles

This case provides state-by-state data from the Centers for Disease Control and Prevention's (CDC, in Atlanta) annual Behavioral Risk Factor Surveillance Survey. The student is asked to present a summary of the data.

> HeroBuilders.com

Emil Vicale, president of BBC Design Group, used rapid prototyping technology (RPT) to build wax or plastic three-dimensional prototypes of his clients' designs. But this same technology can be used to custom-manufacture dolls. Shortly after September 11, 2001, Vicale Corporation, BBC's parent company, purchased an e-commerce toy company. Vicale's first action figure was made to honor the heroes who emerged from that event. Using RPT, he crafted a doll with the head of George W. Bush and the body of Arnold Schwarzenegger. Other figures followed. This case is about a design firm that used exploratory research to define a niche in the action-figure business. **www.herobuilders.com**

> HiTech Engineering

The student is asked to evaluate the effectiveness of a variety of promotional approaches used by this designer and manufacturer of industrial products. Based on the data, the student is asked to identify the most effective method currently employed or a combination of approaches.

> Inquiring Minds Want to Know—NOW!

This case describes a multistage communication study undertaken by the research department of Penton Media, a publisher of business trade magazines, to determine the long-term viability of a reader and advertiser service, the *reader service card*, a postcard-size device used by readers to request additional information from a particular advertiser. **www.penton.com**