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Wittenberg University

fourteenth edition

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To my husband Bill, for being such a great sounding board. And to my research industry collaborators, for their ideas and examples.

—Pamela S. Schindler

Walkthrough

In a world of disruption, students need a full research tool box.

Have you conducted research?
If not, peek behind the scenes.

There is a story in data.
Do you know how to tell it?

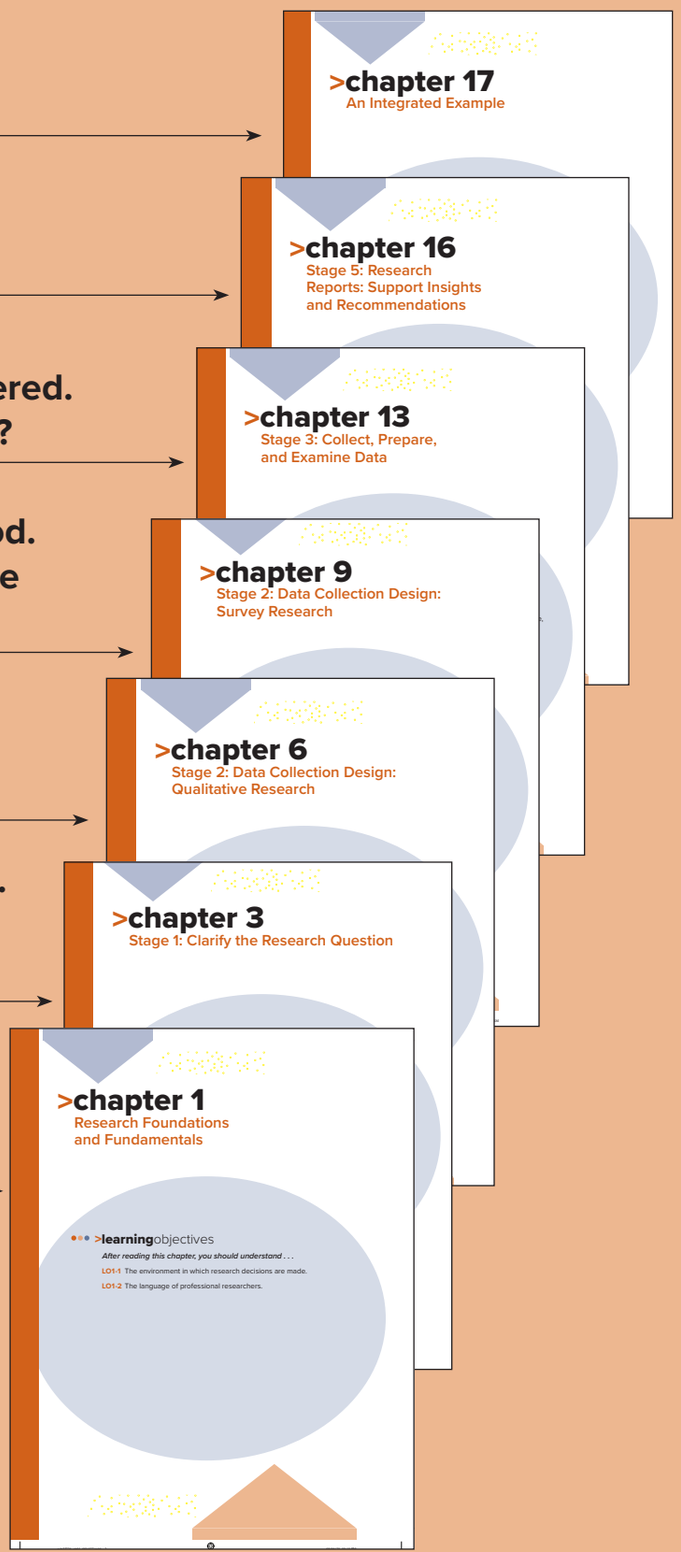
Data isn't ready when it's gathered.
Do you know how to prepare it?

The survey is a powerful method.
Do you know the others that are equally important?

What if you need more info?
Do you know how to take a deeper dive?

A wrong turn takes you nowhere.
Do you know how to ask the right question?

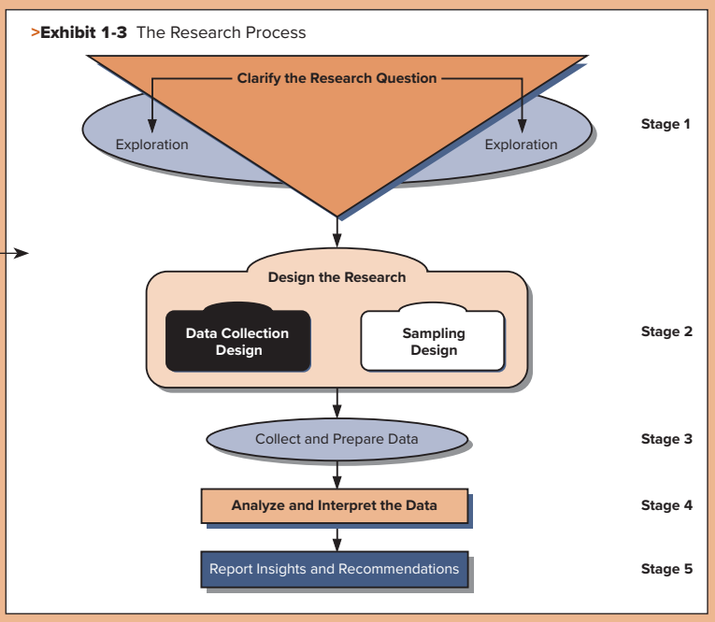
It's a new language.
Do you speak "research"?



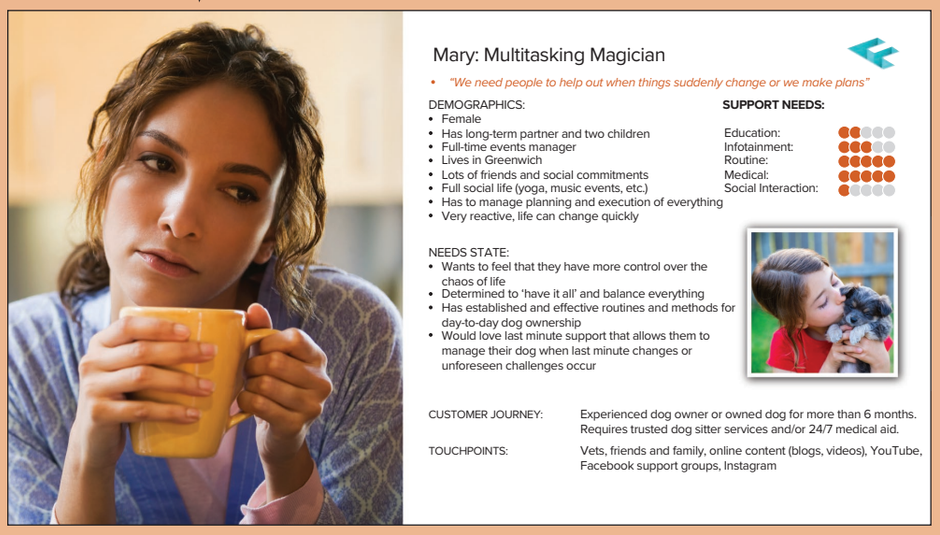
Students are Learning Differently.

Visual learners need pictures, diagrams, and graphs to clarify and reinforce.

31 fully integrated research process exhibits link concepts within stand-alone chapters.



Kinesthetic learners need active-learning experiences: problem-solving, discussion, and collaboration.
Each chapter's Instructor's Manual and PowerPoint are full of ideas and aids for these new learners.



Tono Balaguer/Shutterstock

Real Research is the Basis

>**snap**shot

How Nielsen Recruits Its TV Families

This fall I received a letter inviting my household to become a U.S. Nielsen TV Family. The Nielsen Company is one of the largest research companies in the world. The national and local U.S. TV ratings that Nielsen measures influence the advertising rates on television programming. The ratings and other measures also influence the programming we all have available to us. Nielsen uses a probability sample with distinct cells for various ages, ethnicities, and geographic locations.

The recruiting piece had three elements: an envelope, a letter from Nielsen's Chief Research Officer, and a half-sheet insert. The otherwise plain envelope shouts that "Nielsen has been producing TV ratings for 50 years." The half-sheet contains information about cost and privacy and is designed to reduce any anxiety and increase the recipient's desire to participate: "You have the opportunity to make your preferences known." The letter requests that the recipient make a phone call to set up an in-home appointment. It also provides a special website for more information.

When I explored the website, I realized that committing to be a Nielsen TV Family is very serious business. Each subsequent page of the website introduced me to new research terminology and provided comprehension quizzes as I acquired more knowledge. What the site doesn't explain, however, is *how* you will be sharing your TV viewing habits. As a researcher myself, I'm fairly familiar with some, if not all, of Nielsen's processes. Nielsen clearly wanted the how to be discussed by a Nielsen representative who would visit each prospective participant's home.

Nielsen's process screens out people who work for its company and its partners but did not initially exclude people who work in the research, advertising, or TV industries—like me. What excluded our household was my husband, who when told of the opportunity and what it might entail said an emphatic, "Not interested!" That wish not to participate led to an interesting part of the process. I called the number and offered my personal invitation code as provided in the letter, indicating I needed to decline. Their website had stressed how my household had been chosen and how important it was for my household to participate. From a sampling perspective, they now would need to replace my household with a household similar to mine. I live in a very ethnically diverse neighborhood, and one with very high levels of education. If they move just one household to the east, that household is headed by a single mom who by birth is from Columbia; she's a doctor. If they move one household to the west, that household is an older couple who own a business in St. Martin and who spend less than three months a year in the U.S. Across the street is a couple who own an engineering business, they are transplants from South Africa. I would have expected Nielsen to try harder to convince me to reconsider. But they just thanked me for calling and hung up. A week later I received another letter asking me to reconsider; it contained a newly printed $1 bill.

What issues about sample recruiting does the Nielsen recruiting process raise for you?

www.nielsen.com

Vasyl Shulga/Shutterstock

Snapshots are research examples from the researcher's perspective.

This edition is a collaboration with dozens of researchers.

>**pic**profile

Some concepts need operating definitions to get accurate responses in research. In the Food and Drug Administration's *National Youth Tobacco Survey,* researchers needed to distinguish between *any tobacco use* and *e-cigarette use.* "Any tobacco product use" was defined as "use of one or more of the following tobacco products on ≥1 day in the past 30 days: cigarettes, cigars (defined as cigars, cigarillos, or little cigars), smokeless tobacco (defined as chewing tobacco, snuff, or dip), e-cigarettes, hookahs, tobacco pipes, snus, dissolvable tobacco, and bidis." www.cdc.gov

VICTOR DE SCHWANBERG/Getty Images

concepts—many of which will be quite abstract. Highly abstract constructs can be inferred only from the data; these are presumed to exist but must await further testing and definition. Heather will have the beginning of a **conceptual scheme** if research shows the concepts and constructs in this example to be interrelated and if their connections can be supported. In graphic form, the conceptual scheme depicts the relationships among the knowledge and skill requirements necessary to clarify the job redesign effort.

Operational Definitions

Confusion about the meaning of constructs or concepts can destroy a research study's value without the knowledge of the researcher or its sponsor. Definitions are one way to reduce this danger.

Researchers distinguish between dictionary definitions and operational definitions. In the more familiar dictionary definition, a concept is defined with a synonym. For example, a customer is defined as a patron; a patron, in turn, is defined as a customer or client of an establishment; a client is defined as one who employs the services of any organization or a patron of any shop.[16] These circular definitions may be adequate for general communication but not for research. In research, we measure concepts and constructs, and this requires more rigorous operational definitions.

An **operational definition** is a definition stated in terms of specific criteria for measurement or testing. We must be able to count, measure, or in some other way gather the information through our senses. Whether the object to be defined is physical (e.g., a can of soup) or highly abstract (e.g., achievement motivation), the definition must specify the characteristics and how they are to be observed. The specifications and procedures must be so clear that any competent person using them would classify the object in the same way.

To do this, you need operational definitions. Operational definitions may vary, depending on your purpose and the way you choose to measure them. College undergraduates are grouped by *class.* No one has much trouble understanding such terms as *senior, junior, sophomore,* and so forth. But the task may not be that simple if you must determine which students comprise each class. Here are two different situations involving a survey among students where we want to classify their answers by their class level. Each uses a different definition of the same concept:

1. You ask them to report their class status and you record it. In this case, class is freshman, sophomore, junior, or senior; you accept the answer each respondent gives as correct. The operational definition for class: how the student themselves classify their class.

PicProfiles use a visual to enhance the research concept described.

for Lively Class Discussions.

A Closeup offers a more in-depth example.

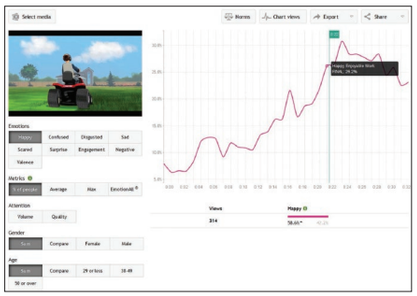
>closeup

Measuring Human Emotion with Facial Coding

Emotions play a big role in consumers' decision-making processes. However, a rational-based decision-making model still dominates the testing of creative ad concepts for large-ticket items. Cleveland-based advertising agency Marcus Thomas LLC needed a research design that could reveal a means to enhance its client's awareness among purchasers of outdoor power equipment (OPE). Its standard approach—a survey—would provide important information, but Marcus Thomas was convinced that its client, Troy-Bilt®, needed to make an emotional connection. A survey alone wouldn't be enough to reveal which of the three ad concepts would resonate the strongest emotionally with participants, while revealing opportunities to strengthen creative messaging and ad cues. "How a person feels about a product or service in the moment activates memories and triggers behavior that influences their rational responses—whether they buy a product, talk about it with others or recommend it," shared Jennifer Hirt-Marchand, partner and director of research at Marcus Thomas LLC. "In this way, emotions not only drive human behavior, but they impact business as well." Marcus Thomas decided to conduct a multiple-methodology study that combined the measurement of human emotions using web-based facial coding with the more traditional online survey to reveal the "why" behind the emotions.

Most consumers who are aware of Troy-Bilt view it as a good brand of outdoor equipment. It has spent more than 75 years helping homeowners care for their lawns and gardens, power wash decks and patios, and remove snow from walkways and driveways. Marcus Thomas and Troy-Bilt partnered with Realeyes, a U.K.–based firm that specializes in measuring emotion using a facial-coding platform powered by artificial intelligence (AI). Realeyes recruited participants who shared access to their webcam and smartphone cameras. Marcus Thomas provided three animatics to test.

An animatic is a video created from a storyboard—drawings of scenes of a TV ad—usually accompanied by a soundtrack (dialogue, sound effects and music). It is a preproduction step, before an ad is created.



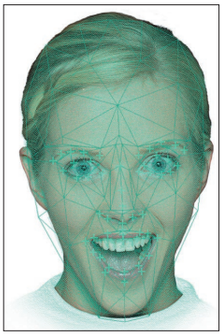
Courtesy of Realeyes

>closeupcont'd

The three animatics were shown online to more than 300 adults, ages 18 and older, who were responsible for OPE purchase decisions. To eliminate order bias, the three videos were rotated so each video was seen first by about one-third (100+) of the participants. Using a participant's webcam, the Realeyes platform tracked facial expressions in real time using key points on the viewer's face to recognize emotions.

Emotions are detected by *Facial Action Coding System (FACS)*, a methodology developed for the identification and classification of human facial expressions. Long-standing research has established six universal human emotions: disgust, sadness, happiness, fear, anger, and surprise.

"We wanted the participants' spontaneous, genuine reactions—second by second, as they watched each video—rather than basing our decisions solely on their stated behavior," explained Rebecca Wulfeck, research manager at Marcus Thomas LLC. "In our experience, consumers may not fully understand their emotion or how to articulate it. Or, they may describe what they saw or why they liked it, but not how they *feel* about it."



Realeyes

After viewing the animatic, each participant was presented an online questionnaire containing 19 questions. The questions covered a range of topics, including their familiarity with and ownership of OPE brands; what ads for OPE brands they could recall; and brands they would consider for their next OPE purchase. Then questions dug deeper about the Troy-Bilt animatic they watched: the main idea in the animatic; what in the animatic made them think about that main idea; their feelings about the Troy-Bilt brand; whether they would consider Troy-Bilt if they made an OPE purchase and why; whether they thought the animatic was appropriate for Troy-Bilt and different from other OPE ads they've seen; and whether Troy-Bilt OPE was "for them." Finally, they were given a series of words/phrases and asked whether they accurately matched Troy-Bilt as it was depicted in the animatic. They repeated this process with all three animatics.

Research analysis combined the emotional measures data with data from survey research (e.g., pre- and post-exposure purchase consideration, brand favorability, etc.). For the most comprehensive results, multiple cross-tabulations were run in SPSS, looking for patterns by gender, brand ownership, emotional engagement, and so on.

All three animatics performed well and quite similarly on several metrics: emotion, recall, brand consideration (lift after exposure), brand attribute associations, and concept (relevance, distinctiveness and brand linkage, and main idea/message). However, one animatic generated the highest positive emotional reaction. "We didn't just want people to think of Troy-Bilt as reliable, as capable of getting the job done," shared Wulfeck, as that rational motivation wouldn't be sufficient to keep Troy-Bilt in a OPE shopper's consideration set. "We needed them to have a happy emotion associated with using Troy-Bilt products that any subsequent ad based on that winning animatic could evoke."

Using facial-coding results, along with supporting survey responses, Marcus Thomas and Troy-Bilt moved forward with production of the winning concept. Using the selected concept is designed to keep Troy-Bilt high in top-of-mind awareness, encouraging those considering outdoor power equipment purchases to consider Troy-Bilt. Measuring the emotion with facial recognition and animatics proved to be a good way to identify the ad concept that was likely to resonate most with consumers before incurring more costly ad production costs.

marcusthomasllc.com, realeyesit.com, www.troybilt.com

Images serve as visual cues that anchor concepts in memory.

>picprofile

Qualitative data may require different data visualization techniques as the researcher is using data that represents words or images. A *word cloud* depicts the frequencies of different words in a given data set containing text so that words that appear more frequently are larger in the cloud than those that appear less frequently. This visualization tool clearly reveals the main topics and themes in the text and can reveal systematic patterns. Developing a word cloud from raw text that is unformatted may have redundant information, which could add noise to the final result. For this reason, it will be necessary to clean the text before generating a word cloud. Word clouds are easily and inexpensively generated. Check out these Internet-based options: Wordclouds.com, jasondavies.com, worditout.com to try making a word cloud of your own.

Rob Wilson/Shutterstock

Presenting Findings

The purpose of presenting findings is to support insights and recommendations. While a variety of support materials should be used in a research report to connect with different members of the audience, facts and statistics remain the core of many reports and deserve special attention. The presentation of statistics in research reports is a special challenge for researchers. There are three basic ways to present findings: (1) words/text, (2) tables, or (3) graphs.[28]

Words/Text

When there are a small number of statistics to present, words work well. Words can be phrases, sentences or paragraphs, lists, bullet points, or some combination.

Walmart regained its number-1 rank in the Forbes *500 due to its strong sales performance (11% increase; $351.1 billion). Although Walmart surpassed number-2-ranked ExxonMobil in sales, Walmart's profitability ($11.2 billion) was far below the oil giant ($39.5 billion).*

OR

- *Walmart is the second largest business in the* Fortune *500 with revenues up by 6 percent but with profits down by 4.2 percent.*

The drawback to using words is that the statistics are somewhat buried in prose. Thus, the researcher must highlight the relevant statistic in some way. During an oral presentation, the researcher might literally pull out the statistic on a single slide or enlarge it, change its color, or bold it and talk around it. In a written report, the researcher might stylistically bold the statistic or use a pull-out, repeating the statistic in a box alongside the prose much as a newspaper article does to highlight a quote. Words also are most often used to report insights and recommendations (as seen later in Exhibits 16-16 and 16-17).

462

Review Prepares. Discussion Cements.

Review and Discussion Questions tie to learning objectives and come in four types.

>review&discussionquestions

Terms in Review

1 Explain how each of the five evaluation factors for a secondary source influences its management decision-making value.
   a Purpose
   b Scope
   c Authority
   d Audience
   e Format
2 Define the distinctions among primary, secondary, and tertiary sources in a secondary search.
3 What problems of secondary data quality might researchers face? How can they deal with them?

Making Research Decisions

4 TJX Co., the parent company of T.J.Maxx and other retailers, announced in a Securities and Exchange Commission filing that more than 45 million credit and debit card numbers had been stolen from its IT systems. The company had taken some measures over a period of a few years to protect customer data through obfuscation and encryption. But TJX didn't apply these policies uniformly across its IT systems. As a result, it still had no idea of the extent of the damage caused by the data breach. If you were TJX, what internal sources could you use to evaluate the safety of your customer's personal data?
5 Confronted by low sales, the president of Oaks International Inc. asks a research company to study the activities of the customer relations department in the corporation. What are some of the important reasons that this research project may fail to make an adequate contribution to the solution of management problems?
6 You have been approached by the editor of *Gentlemen's Magazine* to carry out a research study. The
7 How might you use exploration using internal sources if you were a human resources officer or a supervising manager trying to increase compliance with safety policies?
8 When Oreo cookies turned 100, Nabisco celebrated with a limited-edition-flavor release called Birthday Cake Oreos, with the taste of Funfetti cake and rainbow sprinkles within the filling center. According to *Vanity Fair*, this Oreo is a very sweet smell and taste experience. Oreos are the number-one packaged cookie brand, selling more than $778.8 million each year. Oreo comes in more than 30 flavor versions, including original, Golden, Double Stuff, and Green Tea. If you were deciding whether to introduce a new Oreo as part of the celebration, how would you frame the question hierarchy?

From Concept to Practice

9 Develop the management-research question hierarchy (Exhibits 3-2, 3-3) citing the management question, research questions, and investigative questions for each management dilemma below:
   a A home health care services firm is experiencing an increasing number of complaints regarding health care service quality.
   b An auto manufacturer is experiencing low growth of stock value causing investors to sell off its stock.
   c A major city newspaper is experiencing declining advertising sales, especially compared to the previous year.
10 At a BMW staff meeting, employees were told "We're in the midst of an electric assault," referring to electric cars introduced by Mercedes, Porsche, Jaguar, and most notably, Tesla. A fund manager at Union Investment parroted this sentiment, "BMW is falling behind in electrics." Develop an exhibit similar to Exhibit 3-4 for this management dilemma.

>keyterms

Key terms are a valuable refresher of concepts covered in each chapter.

>glossary

3-D graphic a presentation technique that permits a graphical comparison of three or more variables; types include column, ribbon, wireframe, and surface line.
a priori contrasts a special class of tests used in conjunction with the *F* test that is specifically designed to test the hypotheses of the experiment or study (in comparison to post hoc or unplanned tests).
acquiescence bias a tendency for participants to agree with an item or statement within a measurement question that asks for levels of agreement/disagreement; occurs when they have less knowledge on a topic; more a problem for less educated or less informed participants.
action research a methodology with brainstorming followed by sequential trial-and-error to discover the most effective solution to a problem; succeeding solutions are tried until the desired results are achieved; used with complex problems about which little is known.
actionable insights insights aligned with key business goals and strategic initiatives that are novel, unusual, or unexpected and that lead to recommendations for specific decisions.
administrative question a measurement question that identifies the participant, interviewer, interview location, and conditions; generates nominal data.
after-only design preexperimental design that takes one measurement of DV from all participants after manipulation of the IV.
alternative hypothesis (H_A) an assumption that a difference exists between the sample parameter and the population statistic to which it is compared; the logical opposite of the null hypothesis used in significance testing.
asynchronous interview an interview where the interviewer and participant are not in direct contact; interviewer prerecords the questions which are sent to the participant electronically. Participant answers the questions at a time and location that is convenient for them, within the time frame provided, then uploads their answers.
attitude a learned, stable predisposition to respond to oneself, other persons, objects, or issues in a consistently favorable or unfavorable way.
attitude scaling process of assessing a person's disposition (from extremely favorable disposition to an extremely unfavorable one) toward an *object* or its *properties* using a number that represents a person's score on an attitudinal continuum range.
audience analysis an analysis of the expected audience for a research report.
audience-centric planning a research report orientation whose focus is on gaining the audience's embrace of data insights and recommendations; the resulting presentation is persuasive and tells a story employing statistics.
auditory learners audience members who learn through listening; represent about 20 to 30 percent of the audience; implies the need to include stories and examples in research presentations.
authority figure a projective technique (imagination exercise) in which participants are asked to imagine that the brand or product is an authority figure and to describe the attributes of the figure.
automatic interaction detection (AID) a data partitioning proce-

Glossary reinforces the language of research.
For each term, it summarizes information from all chapters.

Projects Provide the Proof.

>Exhibit 11-10 How to Build a Likert Scale with Item Analysis

Item analysis assesses each item (statement) in a Likert scale based on how well it discriminates between those people whose total score is high and those whose total score is low.

Step 1	Collect a large number of statements that meet the following criteria • Each statement is relevant to the attitude being studied. • Each statement reflects a favorable or unfavorable position on that attitude.
Step 2	Select people similar to study participants (participant stand-ins) to read each statement.
Step 3	Participant stand-ins indicate their level of their agreement with each statement, using a 5-point scale. A scale value of 1 indicates a strongly unfavorable attitude (strongly disagree). A value of 5 indicates a strongly favorable attitude (strongly agree). The other intensities, 2 (disagree), 3 (neither agree nor disagree), 4 (agree), are mid-range attitudes (see Exhibit 11-3). • To ensure consistent results, the assigned numerical values are reversed if the statement is worded negatively. The number 1 is always strongly unfavorable and 5 is always strongly favorable.
Step 4	Add each participant stand-in's responses to secure a total score.
Step 5	Array these total scores from highest to lowest; then and select some portion—generally defined as the top and bottom 10 to 25 percent of the distribution—to represent the highest and lowest total scores. • The two extreme groups represent people with the most favorable and least favorable attitudes toward the attitude being studied. These extremes are the two criterion groups by which individual Likert statements (items) are evaluated. • Discard the middle group's scores (50 to 80 percent of participant stand-ins), as they are not highly discriminatory on the attitude.
Step 6	Calculate the mean scores for each scale item among the low scorers and high scorers.
Step 7	Test the mean scores for statistical significance by computing a t value for each statement.
Step 8	Rank order the statements by their t values from highest to lowest.
Step 9	Select 20–25 statements (items) with the highest t values (statistically significant difference between mean scores) to include in the final question using the Likert scale.

Researchers have found that a larger number of items for each attitude object improves the reliability of the Likert scale. As an approximate indicator of a statement's discrimination power, one authority suggests using only those statements whose t value is 1.75 or greater, provided there are 25 or more participant stand-ins in each group. See Exhibit 11-8 for an example.

Source: Adapted from Allen L. Edwards, *Techniques of Attitude Scale Construction* (New York: Appleton-Century-Crofts, 1957), pp. 152–54.

participants choose the same answer for all statements). Using both positively and negatively worded statements within the same question can discourage this practice or make the participant easier to spot and address during data preparation.

Semantic Differential Questions

Questions based on the **semantic differential (SD) scale** measure the psychological
tude object using bipolar (opposite) adjectives. The SD scale is based on the propo
can have several dimensions of connotative meaning. The meanings are located
property space, called *semantic space*. Connotative meanings are suggested or implie
tion to the explicit meaning of an object. For example, a roaring fire in a fireplace m
as well as its more explicit meaning of *burning flammable material within a brick*
trying to attract patrons on slow Tuesday evenings offered a special Tuesday menu
home cooking." Yankee pot roast, stew, and chicken pot pie, although not its usual
connotative meaning of *comfort foods* and brought patrons into the restaurant, makin
busiest nights of the week. Advertisers, salespeople, and product and package design
that they must use words, shapes, associations, and images to activate a person's con

How-to Exhibits and sample Appendices help students DO research.

>appendixB

Focus Group Discussion Guide*

Background

What if your firm manufactures cleansing products in multiple forms—deodorant bar, beauty bar, cream body wash, gel body wash—and your customers are not using the best form for their skin types and activity levels? You might use exploratory focus groups to determine what drivers motivate customers to select the *form* they choose. Given the dramatic growth in this market, you want to hear from women aged 16 to 50 and also from men aged 16 to 25. Also, you need to understand their trade-offs when choosing a specific form.

You turn to a research specialist to conduct focus groups in three cities representative of the category market. Prior to meeting the six groups (two groups in each city; two consisting only of teens), researchers ask each participant to prepare two visual collages using pictures cut from magazines. One collage is to reflect the participant's perceptions and experiences with each form (regardless of personal use experience). A second collage is to depict a month in the participant's life. The Intro and Forms segments of the discussion guide below reference these creative exercises.

Personal Cleansing Form Drivers — Atlanta, Seattle, Phoenix

INTRO (15 min)

A. ALL ABOUT ME–name, family info, work, play, activities, interests. SHOW LIFE IN THE MONTH COLLAGE
B. AT SOME POINT ASK: How often shower / bathe?
Use fragrances / perfume? How often?
Use scented or unscented deodorant, lotions, etc?

FORMS (60 min)

A. LISTED ON EASEL "DEODORANT BAR, BEAUTY BAR, CREAM BODY WASH, GEL BODY WASH"
Here are the different forms of soaps available that we want to learn about.
How many have ever used _____? Still using or moved on / rejected?
B. EASEL RESPONSES (BE SURE PICTURES ARE LABELED) Show and describe your picture collage (from homework), as you tell what you like / not, what **associate** w/_____ form.
What else **like? / why use?**
What **not like** about _____? Why not using (more often)?
How compare to other forms–advantages / disadvantages?
What **wish for** this form . . . what would make it **better / perfect** for you?
How / why **begin** to use? Specifically, what **remember** about _____ form then?
How find out about it? (ads, TV commercial, friends) What details remember about the ad–what show, who in it?

REPEAT FOR ALL FORMS

C. LINE UP THE FORMS–When you think about these different forms, are they **basically the same**–just a different form or do you think of these as different products with **different results**? Describe.

>preface

So much is happening in business as we move into this third decade of the millennium. I wanted to know how researchers were dealing with the constancy of change. I heard two themes consistently: justification and speed. With so much of a firm's resources being committed to data-driven decision making and data analytics, justifying the need for new data has become difficult for some managers. Speed in research continues to be increasingly important in the current business environment. Happily, quality is not being sacrificed for quick information. Being confident in the results is still critically important.

All sorts of terms are used to describe the unstable environment in which most businesses are operating: *chaos, upheaval,* and *disruption* are some of the most common terms that surfaced. Some firms are sacrificing research and standing their ground or making bold moves without its guidance. Other firms are finding alternative methodologies that can deliver insights more quickly. Others are forming ecosystems and sharing their existing data with this partnership of firms. Still others are conducting new research to make bolder moves to cause disruptions in their own industries.

I've used various interim *GreenBook Research Industry Trends (GRIT)* reports to guide the research for this revision. The latest GRIT Report is based on the largest study of research suppliers and users ever conducted. Automation and privacy are hot topics in GRIT, so I've added material on both these topics in the 14th edition. GRIT is always a wealth of great analysis and a stimulator of questions that has me seeking out collaborators for their ideas and experiences.

In researching trends in business research, I discovered several outstanding books published on research methodologies since the last edition, so I've shared some highlights of those in some of the snapshots. Some of my favorite research ideas come not from the world of business, which makes their discovery all the more special. I hope you'll be enticed to explore these books, not just settle for the nuggets I've shared in Snapshots and Closeups.

As revealed in the Detailed Changes in this Edition, you'll find many new Snapshots, CloseUps, and PicProfiles that reveal how research is being conducted in a variety of different industries. The topics covered by the research stories and issues featured in this edition include extended reality in research, e-cigarettes, automation, foresight in decision making, avoiding problem participants, Nielsen's recruiting process, humanizing participants, interviewing strangers, sharpening observation by studying art, grocery experiments with delivery, use of QR codes in research, phone survey response rates, lifetime value as a metric, diversity and inclusiveness, Generation Z, a new prediction metric influencing advertising, research on top workplaces, relationship between smoking and vaping, relationship between negative feedback and performance enhancement, radio spins and artist success in country music, infographics as a reporting tool, word clouds to report text data, video as a learning tool, a persona as a reporting device, the power of a single number to accomplish action, cyber security, prediction markets, sentiment analysis, why data analytics isn't delivering results, millennials and housing, the art of asking questions, learning to tell research stories, automation in secondary data searches, agile research, mixed access sample recruitment, digital transformation, eye tracking, experiments in employee health, use of robots, experimental labs, gaming in research, packaging redesign, question banks, survey engagement, coding word data, data insights, finding best practices, presentation venues, and more.

I've let news headlines guide me as I looked for new discussion questions, so you'll find discussion questions, especially those labeled *From the Headlines,* covering Sandra Bullock and Ellen DeGeneres' lawsuit against firms using their likenesses to sell fraudulent products, personal data and privacy concerns, loyalty programs, Victoria's Secret, robots replacing workers, Boeing 737 MAX and safety, HR Trends Report: The DNA of Human Capital, Brazil's Natura Cosmeticos SA, GM's Cadillac in China vs. U.S., fast-fashion retailer Forever 21, media streaming and AMC theaters, sensitive content and monetization on YouTube, Globalforce MoodTracker employee engagement survey, sexual harassment of country music rising stars, and Ipsos MORI study of Generation Z.

The various studies of Generation Z also influenced the revision of the peripherals, especially the Instructor's Manual and PowerPoint. Gen Z students have a different way of learning (see the Walkthrough) that helps explain the frustrations of my teaching colleagues over the last few years—and from this edition's reviewers—about student lack of engagement. Research methods is a subject where active learning is not only possible, but highly desirable; such methods are directly synchronized with how Gen Z likes to learn. I've added more suggestions for in-classroom engagement to the Instructor's Manual, to help instructors who are new to this type of teaching. The PowerPoint slide decks have been reorganized to facilitate active learning as well.

Keep the Features Adopters Love, but Add Value

In each new revision, I'm always sure to keep *Business Research Methods* responsive to (1) industry practices and

(2) shifts in teaching pedagogy and environment, and (3) student learning approaches. In an attempt to make the 14th edition more flexible to current instructional methodologies or learning styles, I've stayed true to what made the book an industry leader.

- **Critical Core Content.** My faculty reviewers this time around didn't pull their punches. It gave me a fresh perspective when looking at material I've looked at for more than 30 years. I've listened to their sometimes-contradictory remarks and tried to find common ground to strengthen areas they thought needed a fresh angle or approach. Materials adopters have loved for decades are still, though, the core of this edition.
- **Strong Summaries for Each Learning Objective.** The summaries are comprehensive, knowing sometimes these are the only material a student has time to read before class. These are tightly tied to the learning objectives and the key terms in the chapter.
- **Multipurpose Discussion Questions.** These can serve as review for students, as testing exercises, or as options for lively class discussions as many are pulled from the headlines reflecting real business situations.
- **Appendices that Add Value.** End-of-chapter and end-of-text appendices offer information that, given the differing skills and knowledge of their students, professors may choose to emphasize or exclude. End-of-book appendices offer opportunities for active learning, and testing, supplementing text material.
  - **End-of-Chapter Appendices** in the 14th edition relate to
    - Calculating sample size (Chapter 5).
    - Sources for measurement questions (Chapter 11).
    - Building better tables for examining data (Chapter 13).
    - Describing data statistically (Chapter 13).
    - Tips on improving reports (Chapter 16).

    When an end-of-chapter appendix loses its usefulness, I drop the appendix but incorporate some of its more valued content into a relevant text chapter exhibit or content. I did this with two appendices in the 14th edition.
  - **End-of-Book Appendices** in the 14th edition
    - Appendix A (Business Research Proposals and RFPs) is organized with three active-learning exercises in mind: writing a formal proposal, creating an RFP, and assessing a proposal submitted in response to an RFP. Professors sometimes use writing a proposal or an RFP as an end-of-term project or testing exercise, and find the appendix and the sample within this appendix valuable.
    - Appendix B (Focus Group Discussion Guide) can be used as a sample for developing a guide or for a discussion of issues and problems related to conducting focus groups.
    - Appendix C (Nonparametric Significance Tests) can be used to supplement the chapter on hypothesis testing.
    - Appendix D (Statistical Tables) can be used to discuss the mathematical foundation of hypothesis testing, association, and correlation.

Add Value to Teaching and Learning Resources

As a teacher and a researcher, I always assume there is a better way to do something. Just as innovation is the lifeblood of a business, it's the lifeblood of a classroom, too. At educational conferences, I'm always drawn to sessions on teaching approaches. I've mentored dozens of new faculty in various teaching approaches in my career. When faculty reveal they don't look at the resources that come with their books or share the appropriate ones with their students, I wonder why. *Business Research Methods* comes with a comprehensive set of teaching and learning resources for both faculty and students. I hope you'll use them and send me suggestions for improving them for the next edition.

- **Instructor's Manual (instructors only).** Decades of reviewers tell me that *Business Research Methods* is often assigned to professors new to teaching. I bring 40 years of teaching and even more years of research experience to the subject, so it's important to me that both teachers and students have a wonderful experience. That means making the Instructor's Manual a valuable tool. It's full of information, teaching ideas, and teaching tools. It can help in a pinch, when preparation time is slim, when your tried-and-true approach seems to be failing to reach your Gen Z audience, or when you want to shake things up and try something fresh. Each chapter offers
  - Suggestions for *Active-Learning Exercises*
  - Suggestions for *Web Exercises.* While students surf the web all the time, they are often novices at finding the information they want on the web—just ask any librarian. Due to the ever-changing nature of web URLs, you'll find these exercises within the IM, not the text.
  - *List of Exhibits,* by number and title

- *List of Key Terms*
- *Chapter Outline*
- Answers to end-of-chapter *Review & Discussion Questions*
- *Additional Discussion Opportunities* based on business research examples featured in prior editions.

Examine the Instructor's Manual for ideas for using the resources below in your classroom.

- **PowerPoint.** While you can use these to guide a lecture, these slide decks are designed to facilitate discussion. This means one particular slide deck might be used for several class sessions, or only one. Faculty are encouraged to reorder the slides in any order that fits the activities you plan for your class session or just make notes of the slides you want and jump to them. Even when faculty don't use PowerPoint, students might find the Chapter Outline portion of the slide deck a good review of the chapter or a good note-taking summary for class. Each chapter's deck provides at minimum
  - *Exhibit* slides: one or more slides for each exhibit providing the visual cues for concept development and discussion.
  - *Concept* slides for key terms not covered by exhibit slides: providing deeper dives into concepts.
  - *Image* slides: providing links to visual cues in the chapter.
  - *Snapshot/CloseUp/PicProfile* slides: discussion slides, one or more for each of these special features in the chapter.
  - *Industry Thought Leadership* slides, one or more for each chapter, sharing a quote or issue for discussion.
  - *Key Term List* slide(s): one or more for each chapter, for review and quizzing.
- **Video Supplements.** Video supplements can be used as preparation for an in-class exercise or shown in the class as part of such an exercise. Some attach to a particular Snapshot/CloseUp/PicProfile or case. In the IM section on *Video,* you'll find suggestions for video downloadable from company websites, YouTube.com, Ted.com, and more. Some explain concepts or provide examples; others set the stage for a thought-provoking discussion.

  In CONNECT you'll find video that my collaborators have shared, such as:
  - An experiment in observation using body cameras; use for discussing error in observation research.
  - Several short segments drawn from a two-hour metaphor elicitation technique (MET) interview; use to teach students to conduct almost any type of individual depth interview or to explain the concept of researcher–participant rapport.
- **Cases.** Cases offer an opportunity to examine management dilemmas and research projects in more depth and detail. You'll find detailed discussion guides for each case in the Instructor's Manual.
  - **Video Research Cases.** Four full video cases were written and produced especially to match the text's research process model. These feature noted companies Lexus, Starbucks, Wirthlin Worldwide (now Harris Interactive), Robert Wood Johnson Foundation, GMMB, Visa, Bank One, Team One Advertising, U.S. Tennis Association, Vigilante New York, and the Taylor Group.
  - **Written Research Cases.** You'll find cases about hospital services, state lotteries, data mining, fundraising, new promotions, and website design, among other topics, featuring organizations like Akron Children's Hospital, Kelley Blue Book, Starbucks, Yahoo!, the American Red Cross, and more.
- **Data Files.** If your course doesn't involve a project where students collect their own data, use one of the cases that contain data to have them work with concepts found in Chapters 13–16. For example, you can modify the data (make it "dirty") and have students prepare it for analysis, develop an analysis plans, construct dummy tables, choose appropriate tests for analysis, and more.
- **Sample Questionnaires.** The *Case Index* identifies which cases contain questionnaires. Use these for opportunities for active-learning exercises or discussion. Students can be asked to find problems with questions, question order, question transition, and so on.
- **Sample Student Project.** Appropriate data visualization in the finished deliverable is crucial to creating a strong research report. Have students critique this one.
- **Appendices.** You'll find additional appendices within CONNECT: Bibliographic Database Searches, Advanced Bibliographic Searches, Complex Experimental Designs, Test Markets, and Pretesting Options and Discoveries. Assign these if you plan an active-learning exercise that needs more content than the text offers. For example, my class has a full period in the library computer lab where I team teach with our business librarian a session on an exploration strategy. Students review the

Bibliographic Database Searches, Advanced Bibliographic Searches appendices, as well as the section in Chapter 3, in preparation.

- **Articles, Samples, and Templates.** Students often need to see how professionals do research to really understand the research process. You'll find a sample EyeTrackShop report, a Nielsen report of using U.S. Census data, an Excel template for generating sample data displays, and more. *Multivariate Analysis: An Overview* is a chapter mostly for the benefit of graduate students who use *Business Research Methods.*
- **Test Bank with Answer Key** (instructors only). More than 1,700 objective and essay questions are included, tied specifically to the learning objectives and the key terms in each chapter. If you have the equipment, you can use these for in-class polls, but most faculty use them for assessment quiz or test questions.

Collaborators

Research Industry

Research industry collaborators are the lifeblood of this textbook writer. The following people collaborated directly on material in this edition or connected me with those who did: Bella Tumini, Suja; Betty Adamou, Research Through Gaming Ltd.; Carlos Santiago, Santiago Solutions Group; Colin McHattie, iTracks; Dan Weber, iTracks; Daniel Enson, Toluna; Edwige Winans, Marcus Thomas LLC; Eric Lipp, Open Doors Organization; Hans Lee, Sticky; Jennifer Hirt-Marchand, Marcus Thomas LLC; John Whittle, Further; Justin Ohanessian, Sticky; Lenard Murphy, GreenBook; Malgorzata Kolling, OdinAnswers; Nicola Petty, Statistics Learning Centre; Pete Cape, SSI; Rebecca Wulfeck, Marcus Thomas, LLC; Seth Stoughton, University of South Carolina; Stuart Schear, Robert Wood Johnson Foundation; Tom H.C. Anderson, OdinAnswers; Tom Hill, Axiom Consulting Partners;

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Faculty and Students

The 13e faculty reviewers represent a small sample of adopters and nonadopters; they teach in-classroom, online, and hybrid courses; they are seasoned teachers or very new at their craft; they teach in small and large institutions. Their insights, aggravations, frustrations, suggestions, and disagreements were challenging to address but inspired innovative solutions, some simple and some more complex. And, as always, their comments encouraged me to examine every word, every sentence, and every concept to find better, clearer ways to engage students in the subject I love. Reviewers wanted more bullet lists, rather than prose, when appropriate; I complied where possible. Often their wants contradicted, so I found a different path I hope will satisfy both. Reviewers' feedback also encourage me to take a deeper look at the Instructor's Manual and PowerPoint, to see what I could do to make these two peripherals more supportive of teaching approaches that support active learning. While I couldn't give reviewers everything in the textbook they wanted, I hope adopters will find the changes I made to this edition and its peripherals valuable.

Reviewers for this edition's revision included: Carol Jones, University of Alabama; Carolyn Scott; American National University; Gregory Lubiani, Texas A&M-Commerce; Jennifer Trout, Rasmussen College; Mary Hamman, University of Wisconsin-La Crosse; Pushkala Raman, Texas Woman's University; Rick Simmons, Texas A&M; and Rikki Abzug, Ramapo College. Prior edition reviewers included: Ahmed Al-Asfour, Ogala Lakota College; Zara Ambadar, Carlow University; Don Ashley, Wayland Baptist University; Kristopher Blanchard, Upper Iowa University; Cristanna Cook, Husson University; Charlene Dunfee, Capella University; Ernesto Gonzalez, Florida National University; Wendy Gradwohl, Wittenberg University; Pam Houston, Ogala Lakota College; Yan Jin, Elizabeth City State University; Abdullah Khan, Clafin University; Tracy Kramer, North Greenville University; Rex Moody, Angelo State University; Jason Patalinghug, University of New Haven; Glen Philbrick, United Tribes Technical College; Denel Pierre, Shorter University; Pushkala Raman, Texas Woman's University; Charles Richardson, Clafin University; Marcel Robles, Eastern Kentucky University; Angela Sandberg, Shorter University; Brian Satterlee, Liberty University; Jonathan Schultz, Amberton University; Stefano Tijerina, Husson University; Greg Turner, Clafin University; Sam VanHoose, Wayland Baptist University; Greg Warren, Wilmington University; Beyonka Wider, Claflin University; and Ron Zargarian, University of Indianapolis; Scott Bailey, Troy University; Scott Baker, Champlain College; Robert Balik, Western Michigan University–Kalamazoo; John A. Ballard, College of Mount St. Joseph; Jayanta Bandyopadhyay, Central Michigan University; Larry Banks, University of Phoenix; Caroll M. Belew, New Mexico Highlands University; Kay Braguglia, Hampton University; Jim Brodzinski, College of Mount St. Joseph; Taggert Brooks, University of Wisconsin–La Crosse; Cheryl O'Meara Brown, University of West Georgia; L. Jay Burks, Lincoln University; Marcia Carter, University of Southern New Hampshire; Raul Chavez, Eastern Mennonite University; Darrell Cousert, University of Indianapolis; David Dorsett, Florida Institute of Technology; Michael P. Dumler, Illinois State University; Kathy Dye, Thomas More College; Don English, Texas A&M University–Commerce; Antonnia Espiritu, Hawaii Pacific University; Hamid Falatoon, University of Redlands; Judson Faurer, Metropolitan State College of Denver; Eve Fogarty, New Hampshire College; Bob Folden, Texas A&M University–Commerce; Gary Grudintski, San Diego State University; John Hanke, Eastern Washington University; Alan G. Heffner, Silver Lake College; Ron E. Holm, Cardinal Stritch University (Director of Distance Learning); Lee H. Igel, New York University; Burt Kaliski, New Hampshire College; Jane Legacy, Southern New Hampshire University; Andrew Luna, State University of West Georgia; Andrew Lynch, Southern New Hampshire University; Iraj Mahdvi, National University; Warren Matthews, LeTourneau University; Erika Matulich, University of Tampa; Judith McKnew, Clemson University; Rosemarie Reynolds, Embry Riddle Aero University–Daytona; Randi L. Sims, Nova Southeastern University; Gary Stark, Northern Michigan University; Bruce Strom, University of Indianapolis; Cecelia Tempomi, Southwest Texas State University; Gary Tucker, Northwestern Oklahoma State University; Marjolijn Vandervelde, Davenport University; Charles Warren, Salem State College; Dennis G. Weis, Alliant International University; Robert Wheatley, Troy University; Bill Wresch, University of Wisconsin–Oshkosh; and Robert Wright, University of Illinois at Springfield; and Ken Zula, Keystone College.

This revision incorporates the feedback of countless students who identified areas of confusion so that this edition could make concepts more understandable, who participated in search tests, who worked on numerous

research projects demonstrating where the book needed to include more information or more how-to directions, and who provided reminders with their questions and actions that some aspects of the research process operate below their learning radar.

Data-driven decision making is fast becoming the norm for business. Through this 14th edition, I hope you and your students discover, or rediscover, how stimulating, challenging, fascinating, and sometimes frustrating this world of research-supported data-driven decision making can be.

Many thanks to my McGraw Hill team; without your assistance this revision wouldn't have happened so smoothly: Chuck Synovec, Director; Noelle Bathurst, Portfolio Manager; Ryan McAndrews, Product Developer; Pat Frederickson, Lead Core Project Manager; Harper Christopher, Executive Marketing Manager; David W. Hash, Designer; Fran Simon, Associate Program Manager; Angela Norris, Senior Assessment Project Manager; Margaret Haywood, copyeditor; and Raguraman Guru, proofreader.

Pamela Schindler

>detailedchangestothisedition

In this 14th edition of *Business Research Methods,* revisions were made to incorporate new information and trends in the industry, as well as to be responsive to changing teaching pedagogy. My reviewers indicated where students in their classes were struggling, and I responded to their concerns by reorganizing some material, redefining some terms more clearly, modifying some exhibits, and providing different, clearer examples.

For Teachers and Students:

- 29 new research examples from research collaborations appear as Snapshots, CloseUps, and PicProfiles; where possible, I've also updated holdover Snapshot and CloseUps.
- 23 changes have been made to the Glossary, including the addition of 20 new key terms and some clarifications to other key terms.
- 88 new images will help students to visually anchor key terms, research concepts, and research examples.
- 38 exhibits have been modified (some major, others minor) to make them clearer

For Teachers:

- Each chapter's *Instructor's Manual*
  - has been reorganized to support greater student engagement with a new section, Active Learning Exercises, that covers teaching ideas for Snapshots, CloseUps, and PicProfiles; Industry Thought Leadership; PulsePoints; Video and Film; Web Exercises; Case Discussions; and more.
  - has been reorganized to facilitate review of exhibits and key terms.
  - contains additional research examples for discussion or testing.
- The *Test Bank* has been updated to reflect changes in content.
- Each chapter's *PowerPoint* slide deck
  - has been updated to reflect changes in content.
  - has been reorganized to support active learning exercises with the use of separate slides groups for exhibits; Snapshots, CloseUps, and PicProfiles; and Industry Thought Leadership.

Changes for Each Chapter

Chapter 1

The following elements are new to this edition: A new opening section, focusing on the KPMG study of business CEOs and information and its relation to decision making; two PicProfiles, one on Extended Reality (XR) in business and another using e-cigarettes to discuss operational definitions in the National Youth Tobacco Survey; eight new key terms; nine new images or art to anchor concepts or examples; a reorganization of the review and discussion questions including a new *From the Headlines* discussion question about celebrities fighting the unauthorized use of their likenesses to sell fraudulent products; and a modification to Exhibit 1-11 Model of Traditional Product Life Cycle Theory. Two Snapshots have been moved to the Instructor's Manual: *Identifying and Defining Concepts* and *Radio Chips* vs. *Retinal Scans_ Which Theory Offers the Best Protection,* as well as one discussion question.

Chapter 2

The following elements are new to this edition: two new Snapshots, one on GLG on the way executives learn and another on new privacy legislation; and one PicProfile on automation in research; seven new images or art to anchor concepts or examples; a reorganization of the review and discussion questions including a new *From the Headlines* discussion question about attitudes about personal data privacy. Two Snapshots have been moved to the Instructor's Manual: *Research and Programmatic Algorithms, and GRIT Research Techniques,* as well as one discussion question.

Chapter 3

The following elements are new to this edition: A major modification of Exhibit 3-3 SalePro's Management-Research Question Hierarchy; one Snapshot on Foresight in Decision Making and one Picprofile on the Hallmark and Zola PR implosion and secondary data; seven new images or art to anchor concepts or examples; a reorganization of the review and discussion questions including a new *From the Headlines* discussion question about loyalty programs and a new *From Concept to Practice* question using Exhibits 3-2 and 3-3 and different scenarios. One Snapshot has been moved to the Instructor's Manual: *Using Interviews to refine the Management Question,* as well as one discussion question.

Chapter 4

The following elements are new to this edition: two PicProfiles, one new CloseUp on facial coding to determine emotional response and one new Snapshot on research at Goldman Sachs to influence their hiring process; five new images or art to anchor concepts or examples; a reorganization of the review and discussion questions including a new *From the Headlines* discussion question about Victoria's Secret; one Snapshot has been moved to the Instructor's Manual: *TIAA Performance Management Overhaul,* as well as one discussion question. The Snapshot *AIG Embraces Interviews* moved to Chapter 9.

Chapter 5

The following elements are new to this edition: two new Snapshots, one on how to avoid problem participants and another on how Nielsen recruits its TV families; one new PicProfile on how to humanize participants; one new key term; six new images or art to anchor concepts or examples; a reorganization of the review and discussion questions including a new *From the Headlines* discussion question about the declining milk market; and a minor modification to Exhibit 5-7 How to Choose a Random Sample. Three Snapshots have been moved to the Instructor's Manual: *Ford Reenergizes by Changing Its Sampling Design, Who's Really Taking Your Surveys,* and *Keynote Systems Tests the Power of Search.*

Chapter 6

The following elements are new to this edition: two new Snapshots, one on advice from Malcolm Gladwell on talking with strangers and another on ethnographic interviewing; two new key terms; six new images or art to anchor concepts or examples; a reorganization of the review and discussion questions including a new *From the Headlines* discussion question about the Boeing 737 MAX; and Exhibit 6-1 *GRIT Qualitative Research Techniques* is new, based on the newest GRIT report. One PicProfile has been moved to the Instructor's Manual: *OdinText's use of avatars in research,* as well as one discussion question.

Chapter 7

The following elements are new to this edition: one new CloseUp on sharpening your powers of observation using art as a tool; one new key term; five new images or art to anchor concepts or examples; a reorganization of the review and discussion questions including a new *From the Headlines* discussion question about the HR Trends Report*, The DNA of Human Capital;* and modifications to Exhibits 7-1, 7-2, 7-4,7-5, 7-6, 7-7 to better match the chapter's text. One discussion question has moved to the Instructor's Manual.

Chapter 8

The following elements are new to this edition: one new snapshot on Kroger's venture into delivery of prepared food; five new images or art to anchor concepts or examples; a reorganization of the review and discussion questions including a new *From the Headlines* discussion question about Brazil's Natura Cosmeticos SA; and a modification to Exhibits 8-3. One Snapshot has been moved to the Instructor's Manual: *Zeotap Experiments with Mercedes Benz,* as well as one discussion question.

Chapter 9

The following elements are new to this edition: three PicProfiles, one on GRIT Trends on Survey Research, one on QR codes in research, and another on phone survey response rates; three new key terms; seven new images or art to anchor concepts or examples; a reorganization of the review and discussion questions including a new *Terms in Review* question on privacy and one *From the Headlines* discussion question about GM's Cadillac in China; and modifications to Exhibits 9-1, 9-7, and 9-9. Two PicProfiles (on 2018 GRIT Survey Research Trends and Decline in Phone Response Rates 2016) and one Snapshot (Research Embraces the Smart Phone) have been moved to the Instructor's Manual, as well as one discussion question.

Chapter 10

The following elements are new to this edition: one new Snapshot on lifetime value; four new images or art to anchor concepts or examples; a reorganization of the review and discussion questions including a new *From the Headlines* discussion question about Forever 21 retailer. Two Snapshots have been moved to the Instructor's Manual: *The Emotional Face of Research* and *Measurement of TiVo Households: Skipped Ads vs. Most Watched,* as well as one discussion question.

Chapter 11

The following elements are new to this edition: one new CloseUp on developing a prediction metric (CIIM) and two new PicProfiles, one on the value of diversity and inclusiveness and another on Ipsos MORI's study of Generation Z; six new key terms; seven new images or art to anchor concepts or examples; a reorganization of the review and discussion questions including a new *Terms in Review* question and a *From the Headlines* discussion question about AMC theaters and streaming services; and a new Exhibit 11-6, *Review of Reliability, Validity, and Practicality in Research* and design modifications to Exhibits 11-9, 11-10, 11-11, 11-14, 11-15, 11-18. Two PicProfiles have been moved to the Instructor's Manual: on Snausages and on UrbanDictionary.com. Dropped Chapter 11 *Appendix More on Effective Measurement Questions* and incorporated some of the material

into Chapter 11. Dropped Chapter 11 *Appendix Sample Computer-Based Questions and Guidelines for Mobile Q* and incorporated some questions into Exhibit 11-9 and some material into Chapter 12.

Chapter 12

The following elements are new to this edition: one new Snapshot on Energage's approach to measuring top workplaces and one PicProfile on e-cigarettes; 1 modified key term; three new images or art to anchor concepts or examples; a reorganization of the review and discussion questions including a new *From the Headlines* discussion question about monetization of YouTube content. One Snapshot *Does Cupid Deserve a Place in the Office Cubicle?* and one PicProfile on travel issues has been moved to the Instructor's Manual, as well as one discussion question.

Chapter 13

The following elements are new to this edition: one new Snapshot *Can Negative Feedback Improve Performance;* four new images or art to anchor concepts or examples; a reorganization of the review and discussion questions including a new *From the Headlines* discussion question on the Globalforce MoodTracker employee engagement survey; and major modifications to Exhibits 13-2 and 13-4 with some modifications to Exhibits 13-3, 13-5, 13-11, 13-18, and 13-20.

Chapter 14

The following elements are new to this edition: one new Snapshot on a new HR training model for restaurants; three new images or art to anchor concepts or examples; and a modification to Exhibits 14-9 and 14-11. One Snapshot has been moved to the Instructor's Manual: *Testing a hypothesis of unrealistic drug use in movies.*

Chapter 15

The following elements are new to this edition: one new CloseUp on a relationship between radio spins and success and one new PicProfile on association between decline in cigarette smoking and vaping; two new key terms; three new images or art to anchor concepts or examples; a reorganization of the review and discussion questions including a new *From the Headlines* discussion question about sexual harassment of country music performers by radio programmers; and a modification to Exhibit 15-3. Two Snapshots have been moved to the Instructor's Manual: *Envirosell Studies Reveal Left-Hand Retail* and *Advanced Statistics Increase Satisfaction and Release More Funds through ATMS,* as well as one PicProfile on Constellation Wines, as well as one discussion question.

Chapter 16

The following elements are new to this edition: one new CloseUp on creating 3D personas, one new Snapshot on focusing your research story on one powerful number, and two new PicProfiles, one on learning through videos and another on displaying text data with word clouds; four new key terms; eight new images or art to anchor concepts or examples; a reorganization of the review and discussion questions including a new *From the Headlines* discussion question about Generation Z spending; and modifications to Exhibits 16-1, 16-6, and 16-7. Two Snapshots have been moved to the Instructor's Manual: *Hitting the Wall Is a Good Thing* and *Forrester Research—Finding the Dramatic Story Line,* as well as one discussion question.

Chapter 17

No changes were made to this chapter. An Integrated Example provides an insider's perspective on a research project. This example applies text practices and theory to one example from management dilemma to research report. The companies, Visionary Insights and BrainSavvy, might be fictional, but the research profiled in the example is very real. This chapter can be used throughout the course to review (or test) various concepts, or at the end of the course as the basis for a lively discussion or final exam.

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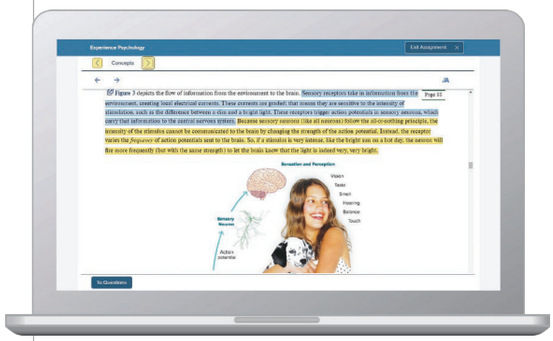

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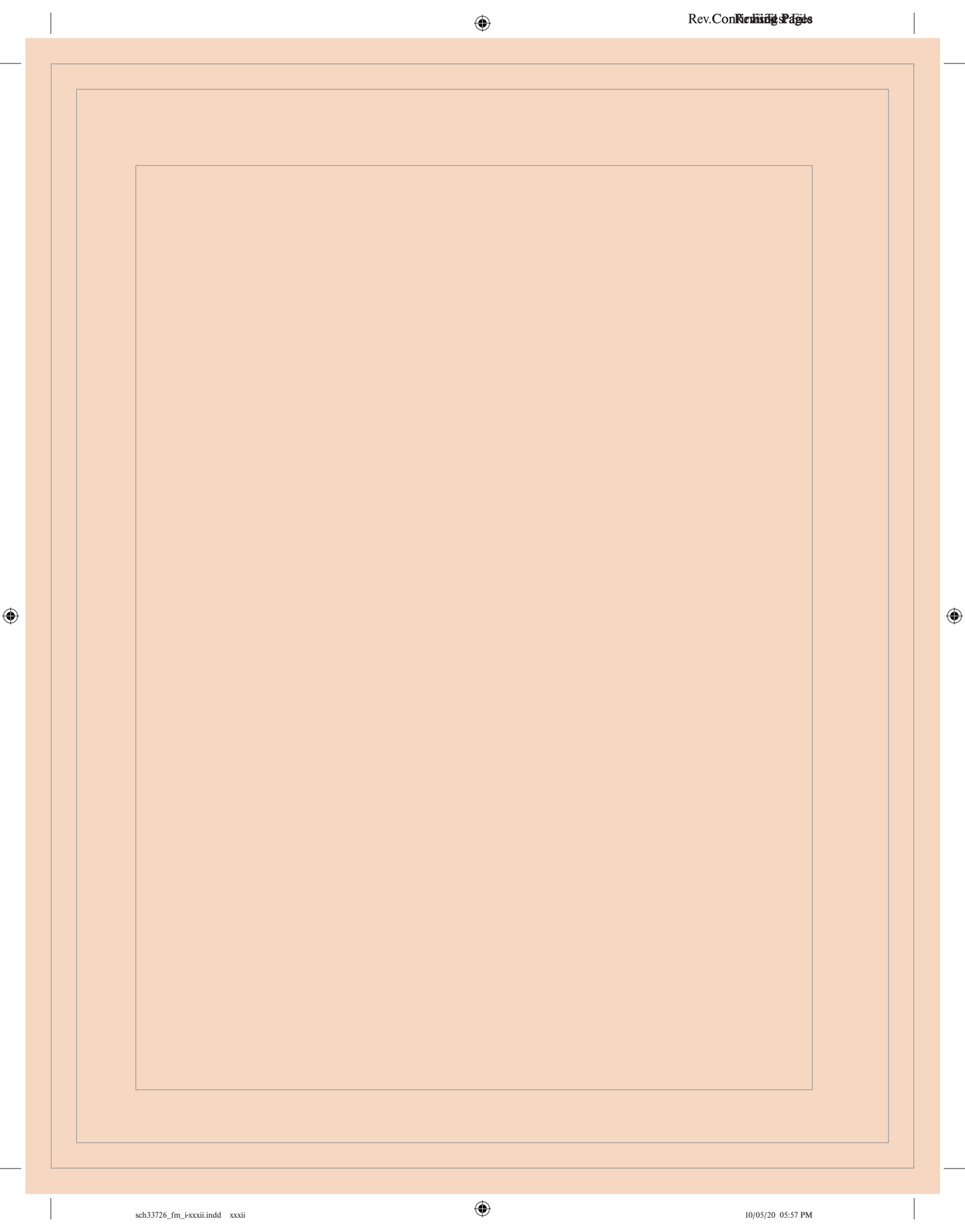
>briefcontents

>appendices 533

>contents



>part I

Building the Foundation for Research

>chapter 1

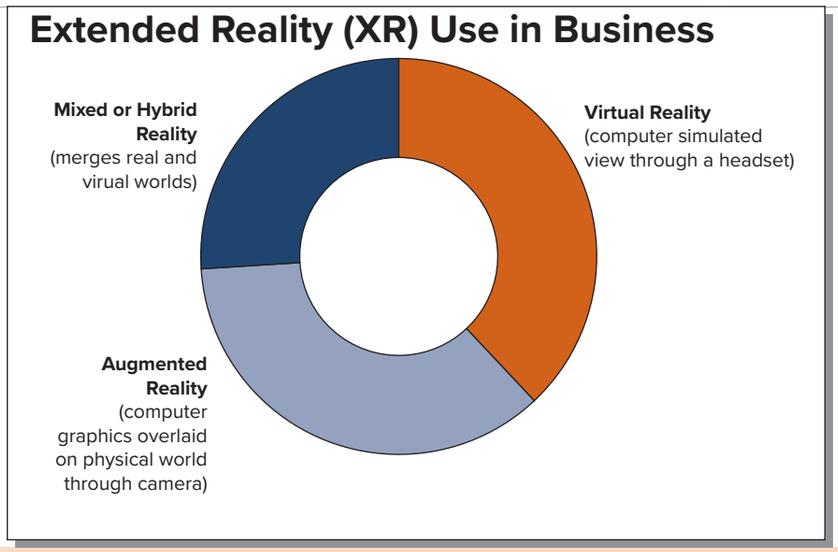
Research Foundations and Fundamentals

>learningobjectives

After reading this chapter, you should understand . . .

LO1-1 The environment in which research decisions are made.

LO1-2 The language of professional researchers.



>picprofile

Consulting firm Accenture highlighted extended reality (XR) as one of its four major technology trends affecting business in the next decade, along with distributed ledger technology, artificial intelligence, and quantum computing. Extended reality represents "immersive technology that creates entirely new ways for people to experience and engage with the world around them." In a global survey of more than 600 consumer goods and services executives from 26 countries, extended reality is expected to assist businesses in furthering their development of personalized products and services. XR is already used extensively in consumer goods and services in gaming, entertainment, medical, and tourism industries. In business-to-business industries, medical and manufacturing have seen the strongest use so far. Research continues to expand its use of extended reality as web and mobile device cameras improve. Research use of extended reality is expected to increase with the widespread implementation of 5G wireless networks in the next decade. **www.accenture.com; www.visualcapitalist.com**

>Business Environment for Decision-Making

It's never been more important for students of business to learn and master the tools and processes of business research. As we enter the fourth industrial revolution, business models that have worked for a century or more are no longer delivering desired growth. For all industries, it's a time of radical reinvention and innovation delivered at a breakneck pace. Artificial intelligence (AI), robotics, automation, virtual reality, endless choice and access, mass customization, fragmented attention, reschooling and retraining of employees, defining an organization's purpose beyond profit, uncertain cyber security, redefinition of privacy, quantum computing, climate emergencies, and ethnic and gender inequities are just a few challenges for business making headlines.

According to KPMG's most recent *CEO Outlook Survey,*[1] CEOs believe that "the next 2–3 years will be more transformational than the last 50." Companies face a dramatic choice: "agility or irrelevance"—68% of CEOs indicated being too slow could lead to obsolescence. Most (81%) believe a firm's success is dependent on improving its understanding of its customers, but that they must do so in an "ethical and protected way." Firms (76%) believe growth is tied to their ability to challenge and disrupt business norms. The best paths to growth are perceived to be forging new partnerships and alliances, and mergers and acquisitions, as opposed to solely growing their core business. More than 70 percent have already invested or are preparing to invest in AI. And while most (72%) agree that "strong cyber security is critical to engender trust with key stakeholders," only 68 percent believe they are prepared for cyberattacks.

Andrew S. Grove, in *Only the Paranoid Survive,* describes businesses as facing numerous strategic inflection points. A **strategic inflection point** is a "time in the life of a business when its fundamentals are about to change."[2] Inflection points are a disruption that demands a response. Today, disruptions are likely to come from new directions and unexpected sources. For example, grocery chain Kroger likely

wasn't expecting to compete with Amazon in the grocery business. CBS and NBC weren't expecting Netflix to be the disrupter of network television. Business managers can feel blindsided when having to read and interpret the signals of change in an unfamiliar environment, creating greater uncertainty for decision-making.

If a business can anticipate strategic inflection points, it can benefit. Rita McGrath, in *Seeing Around Corners,* argues that managers need to anticipate these changes in the business environment as they throw "certain taken-for-granted assumptions into question."[3] Some firms will fail to see these shifts. Others will deny their importance, holding tightly to existing business practices and models. And still others will adapt their practices to benefit from the shift.

Research plays a huge role in helping firms create, identify, or capitalize on strategic inflection points. As McGrath argues, "Organizations looking for the early warnings of an inflection point must have practices in place that allow the information and trends bubbling up . . . to be seen and heard."[4]

Role of Data in Decision-Making

Every manager in the course of his or her career will make thousands of decisions. In business, a **decision**—making a judgment after thoughtful consideration—is always followed by one or more actions. This is true even if the decision is to change nothing and the action is to do nothing. Each decision is triggered by a **management dilemma**—a problem or opportunity—that reflects the recognition of a difference between a desired and an actual condition.

One very important decision a manager repeatedly faces is whether he or she has sufficient information—drawn from data previously collected, including personal experience—or needs more information or new insights to make an effective decision to address a management dilemma.

To understand this decision, you need to understand the distinction between data, information, and insights. Businesses collect lots of **data**—raw, unprocessed facts in the form of numbers, text, pictures, audio or video—on employee performance, products, distribution channels, promotional methods, sales, costs, profitability, training programs, employee engagement, machine precision, legal compliance, competitors, trends, and so on. For example, high school football coaches rely on game video for data to improve team performance. The National Football League (NFL), while it uses video, embeds chips in various game equipment (players' shoulder pads, referee jerseys, footballs, the chains used to measure first downs, etc.). These chips record important game metrics.[5] Exhibit 1-1 provides some ideas for sources and types of data that businesses collect. Due to the extensive size of many of these databases, such data has been referred to as *big data.*

PCN Photography/Alamy

When data is processed it becomes **information**. We process data by accumulating and organizing it; applying rules of measurement, statistical summary, and testing; and developing data presentations that make its true meaning clear. With its microchips, the NFL collects 200+ metrics for each game and these are uploaded to the Amazon Web Services operation for analysis. The resulting information is used to analyze every aspect of a game, providing substantiation—or contradiction—for the gut instincts of coaches and managers.[6]

We generate **insights** by analyzing information in the context of a management dilemma and the business's mission, goals, resources, and culture. When data is originally collected, it is collected for a specific purpose. The insights developed are focused on the management dilemma that drove its collection. When existing data is mined, information and insights are used for a purpose other than that for which it was

>Exhibit 1-1 Where Business Collects Information

Type of Data	Where/How	Data Source
Transactional	Online and in-store purchases	Customer
	Online, phone, in-store inquiries	Potential customer, customer
	Warehouse and shipping manifests	Logistic partners, employee
	Machine performance	Machine data log
Observational	Online Web visits and in-store shopping trips	Customer, employee
	Competitor interactions	Customer
	Click-through paths on Web	Potential customer, customer
	In-store customer service interactions	Customer, employee
	Stock price valuations	Investors
	Biometric measures (e.g., neuromarketing, fMRI, PET, eye tracking)	Potential customer, customer, employee
Conversational (Touch points)	Surveys, online and in-store intercepts	Potential customer, customer, employee
	Call center interactions	Customer, employee
	In-store customer service interactions	Customer, employee
	Web chat interactions	Customer, employee
	In-store checkout	Customer, employee
	Candidate interviews	Customer, employee
	Performance reviews	Potential employee
	Exit interviews	Employee
	Annual stockholder meetings	Employee
	Financial performance presentations	Investor
	Listening tours	Financial analyst, institutional investor
	Twitter posts	Customer, supplier, logistic partner, employee, decision influencer
	Facebook posts (company site)	Customer, employee, competitor, trade associations, distributor
	Blog activity	Customer, employee, trade associations, distributor
	Other social media posts or discussions	Customer, employee, competitor, trade associations, distributor
		Customer, employee, competitor, trade associations, distributor
Internet Analytics	Keyword searches	Potential customer, customer
	Click analysis	Potential customer, customer
	Google+	Potential customer, customer

Our interviews and research for this edition revealed several sources of research data. This table is adapted from that research and author experience as well as from material by Cynthia Clark, "5 Ways to Learn What Customers Aren't Telling You," *1to1 Magazine,* March 5, 2012, accessed March 8, 2012 (http://www.1to1media.com/view.aspx?docid=33464); and "Harness the Conversation: Business in Today's Social World," *Cvent,* accessed March 8, 2012 (http://www.cvent.com/en/sem/business-in-todays-social-worldsurvey-ebook.shtml).

originally intended. For example, Amazon, in an attempt to increase our current order, mines its data of prior customer purchases to provide us with a list of other items that people bought who has also bought what we are ordering. This deeper drive for additional insights is not cost free; it requires analytical skill, time, money, and a broader understanding of the business as well as the methodology(s) involved in originally collecting the data.

While companies collect lots of data as a matter of doing business, historically managers have not always used that data effectively to make decisions. Several factors have influenced this:

- State of digital transition
- Data silos
- Data interpretation deficiencies

State of Digital Transition

As little as 40 years ago, most businesses collected data manually and recorded their data and information on paper. If you walked into any well-organized office, you'd see file cabinets full of folders and shelves full of report binders and ledgers.

Sifting through data in such an environment where it couldn't be easily reorganized or aggregated was cumbersome, tedious, time-consuming, and costly. Once reported, such data was parked on a shelf or filed away. Delving into this data to develop additional insights wasn't considered valuable enough to outweigh its cost. The data, and any deeper insights it might have delivered, were effectively lost to future decision-makers.

In the last two decades, many large businesses have fully migrated to digital collection and storage of their data, while others are partially there. Thousands of small businesses have not joined the digital revolution, making it difficult for them to compete in the emerging data-driven business environment. Even for those businesses that have embraced digital, it has not necessarily meant better data and information or more timely access. Just having a digital data repository doesn't guarantee that a firm will have the right information for each new management dilemma.

Data Silos[7]

Many decisions are made by managers at the business-unit level. Thus, businesses often collect and store data at the business-unit level and share it beyond the unit only on a need-to-know basis. This practice creates the **data silo**, a collection of data or information in an organization that is isolated from and not accessible by other parts of the organization. Forrester Research estimates that between 60–73% of a company's data is inaccessible for analysis; a major reason is data silos.[8] Data silos can be caused by company culture, competition between business units for finite resources, geographic location of business units, layers of management, differing staff skill levels, and software or hardware incompatibility.

Data silos can waste resources by encouraging business units to collect and store duplicate data. Besides higher costs, duplication can lead to data inconsistencies. Data silos can also create incompatible data, making it more difficult to integrate data sets, often necessary for insight development. Data silos can prevent managers from seeing the broader picture and discovering trends, and can lead to missing time-sensitive opportunities. Data silos are a major hurdle to creating the desired gold standard of current business: a **data-driven organization**, where each decision in the business benefits from data in a consistent, organizationwide manner.[9]

Data Interpretation Deficiencies

The first wave of digital data collection primarily accepted numerical data. In the current digital age, a business often includes audio, video, pictorial, and textual data and information in its data collection. This expansion of data types gives the business a richer field of data from which to draw insights but also creates a problem: finding people with the appropriate skills and tools to analyze the expanding ocean of data.

The competition for individuals who can interpret data and deliver insights is fierce. One reason is the severe shortage of people with these skills.[10] The CEOs in KPMG's study recognized that a skills revolution is needed in business, with a majority planning to upskill between 40–60% of their employees in the next decade.[11]

Addressing the Challenges

Businesses are making some progress in creating more transparency about what data resides in various silos and breaking down the data-silo infrastructure. Those firms succeeding have made becoming a data-driven organization a top priority. The infrastructure of data silos builds over time, often using customized software and hardware. Replacing these customized infrastructures with a companywide infrastructure is often not financially feasible. Companies are prioritizing critical business functions and business units and employing infrastructure modification, which is more cost effective but also time-consuming.

According to the Gartner's latest *Data Management Strategy Survey,* two of the top three data management challenges for business relate to data silos: finding and identifying data (58%), and joining, preparing, and sharing data (57%).[12] Companies are starting to embrace machine learning (ML) data catalogs as they continue to struggle with finding, inventorying, and using these vastly distributed and diversely-designed data assets. A **data catalog** creates and maintains an inventory of data assets through the discovery, description, and organization of distributed data. Data catalogs facilitate access to data by all types of organizational users (from IT-based data scientists to line-of-business managers) and permit the rating of data assets and the tracking of data asset use, both tasks critical to assessing data value. Technology consultancy Gartner estimates that those who are successful at implementing ML data catalogs will realize twice the business value from their data.

NicoElNino/Shutterstock

Businesses are implementing digital **business dashboards** that aggregate and visualize data and information from multiple sources, to provide an at-a-glance view of key performance indicators (KPIs). Business dashboards (e.g., Sisense, Tableau, Looker), which are updated in real time, are used for monitoring business performance by displaying historical trends as well as current-decision actionable data. Dashboards make accessing data originating in various silos more feasible; some of the ML data catalogs include business dashboards.

Businesses are getting better at **data blending**,[13] combining data from unique data files from different aspects of the business (e.g., financial, human resources [HR], CRM, inventory management, and manufacturing) or from prior research efforts into a new composite data file. This process often requires "cleaning" the data from the various files to make the data more compatible. Better and faster computing tools are making this process more cost effective.

In our gig economy, some businesses are using short-term personnel contracts or freelance employees to access the skills of data scientists and researchers, as opposed to hiring permanent employees. Other businesses, recognizing that knowledge of all kinds is the new competitive advantage, are developing their own data-focused decision infrastructure through aggressive hiring, as well as training and reeducation of current employees.

In the digital age, keeping up with the data flood is a growing challenge for businesses. Before expanding the ocean of data, managers need to be sure that any new data they add truly adds value to the decision-making process. While some firms are drowning and others are barely staying afloat, some are establishing best practices for using the ocean of data as a foundation for their strategic direction and gaining competitive advantage.[14]

Is New Data Needed?

Managers can, and do, make decisions without new data. When resources of time and money are tight, and risks are low, the seasoned manager might make a decision based on his past experience. Or he might supplement his gut instinct with data available through a digital data repository.

Assume for the moment that you are consulting with the owner–manager of a full-service, single unit restaurant. She is experiencing significantly higher turnover among the restaurant's waitstaff than one year ago. Several long-time customers have commented that the friendly atmosphere, which has contributed to their overall dining experience, is changing. Her *business intelligence system* is designed to provide ongoing information about events and trends in the technological, economic, political–legal, demographic, cultural/social, and competitive arenas (see Exhibit 1-2). It reveals the following: waitstaff turnover is generally high in food service, but hers is higher than the norm; government regulations on restaurant operations have become more stringent; and some area competitors have increased waitstaff wages while eliminating tips. You review the firm's financial records and HR records. She has determined pay, tips, prehire experience level, and work hours and schedules of those waiters who left and compared that data with those who stayed. Several of the high-performance waitstaff have left in the last year; these individuals had worked the high-traffic shifts that loyal customers often frequented. This is the total of the data and information currently available.

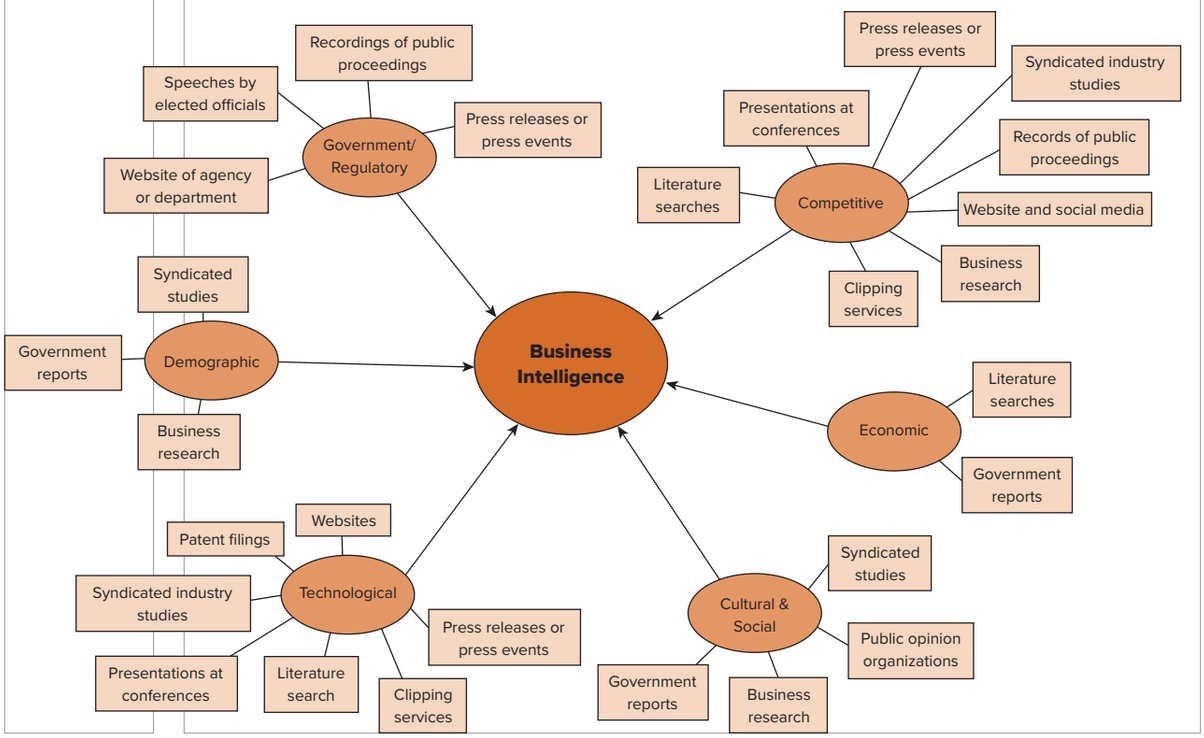
>snapshot

The Importance of Why: Big versus Small Data

In his book, *Small Data: The Tiny Clues That Uncover Huge Trends,* author Martin Lindstrom talks about the importance of knowing why. Lindstrom isn't an advocate of only using big data, indicating big data lacks insight because it focuses on analysis rather than emotional connection. His book focuses on what he's learned as he has visited or lived in more than 2,000 homes throughout the world and how those ethnographic observations paid big dividends. In a Knowledge@Wharton interview, Lindstrom described financially troubled Danish toymaker Lego. In 2002, Lego had ventured away from its core small blocks, instead emphasizing movies, theme parks, apparel, and large building blocks (based on big data about Millennials) only to discover—via interviews and ethnographic observations in homes across Europe—that it was taking away the major reason children play with the toy: the sense of accomplishment. In explanation, Lindstrom writes, "children attain social currency among their peers by playing and achieving a level of mastery at their chosen skill." Lego refocused on the small blocks based on its collection of small data. These actions brought Lego back from near bankruptcy. "You have to remember that Big Data is all about analyzing the past, but it has nothing to do with the future. Small Data, . . . seemingly insignificant observations you identify in consumers' homes, is . . . the emotional DNA we leave behind."

Brownstock/Alamy Stock Photo

>Exhibit 1-2 Some Sources of Business Intelligence

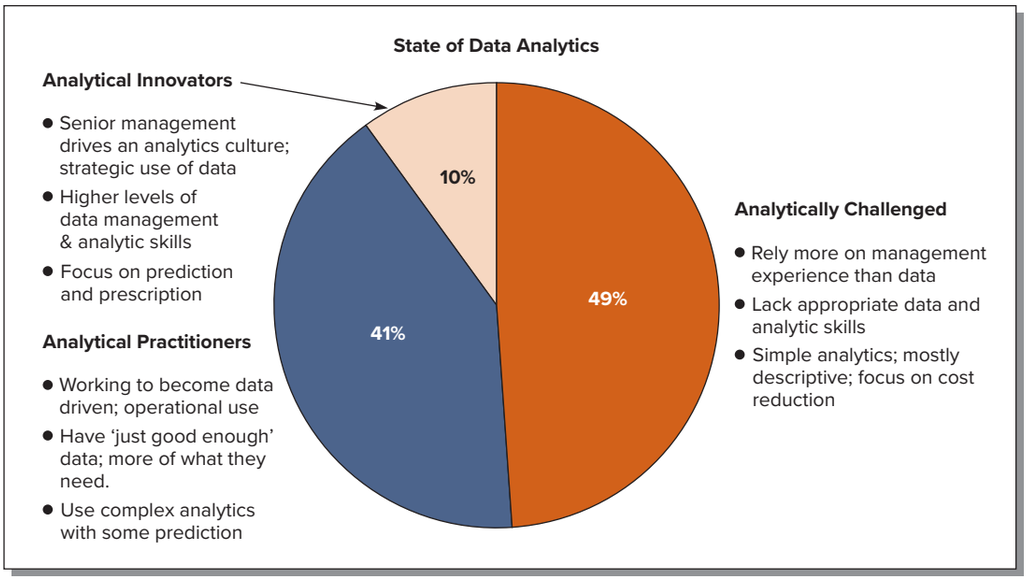


>snapshot

Analytics Under-delivers Compared to its Hype

The latest report from *MIT/Sloan Management Review* and SAS, classifies analytic users on three levels of maturity: analytical innovators (who apply analytics strategically), analytical practitioners (who apply analytics operationally), and the analytically challenged (who rely more on management experience than analytics to make decisions). Analytical innovators benefit the most from the application of analytics in both the extraction of insights and their dissemination to affect organizational action. This group has not been dramatically growing due to a lack of senior management commitment and a focus on operational rather than strategic use of data.

Some examples of analytical innovators, however, give us role models for the practice. Bank of England (BoE) is an analytic innovator; to fulfill its regulatory role in the British economy, it is aggregating datasets, both microeconomic and macroeconomic, for the first time. BoE has "hired a chief data officer, created a data lab, established an advanced analytics group and formed a bank-wide data community." General Electric, also an analytic innovator, created a new business unit, as well as a huge software division, to manage a cloud-based platform that aggregates and analyzes sensor data from industrial machines. "GE's strategy for data and analytics has become tightly linked to its corporate strategy, a tremendous corporate shift for what was once a traditional manufacturing conglomerate."



Is the restauranteur missing any critical data or information? For example, does she know why the waitstaff is leaving? A deep dive into historical data rarely illuminates the "why" behind attitudes or behavior. And the whys might provide significant insight. However whys are time-sensitive: why someone left a year or a month ago, might not be consistent with why someone left a week ago. Is your restauranteur's management dilemma one for which additional research is needed for an effective decision?

The journey from discovery of a strategic inflection point or a management dilemma to a decision requires information and insights as fuel. But this fuel comes in different grades; think regular gasoline versus rocket fuel. Using insights drawn only from historic data to make a current decision is one approach perfectly suitable for some management dilemmas (e.g., Amazon: How might we encourage customers to buy additional book titles?). Enriching that fuel mixture by collecting new data specific to the current management dilemma might be critically necessary for some management dilemmas. When risks are high and resources are available, having more customized data, information, and insights is preferable.

The Research Process

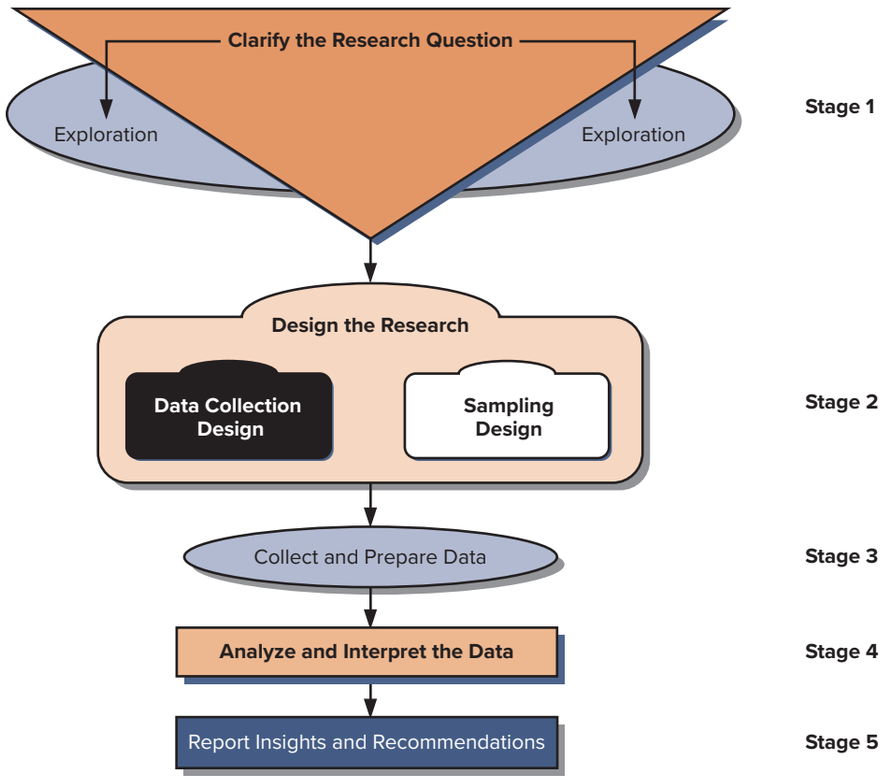
In today's world of research, those who conduct research are expected to be information storytellers and insight providers, critical to helping provide direction for business decision-makers. To glean useful insights, those who conduct research can't just be technically competent in research design and analysis, they are expected to have an understanding of how businesses and organizations work. Managers, who once might have delegated research projects to specialists, are expected to be conversant with research methodologies and tools, in order to extract the full value from any research being conducted. To fulfill either role—conductor or user of research—you'll need to understand both the process and the tools used in business research.

Business research is defined as a *systematic inquiry* that provides information and insights to guide a specified managerial decision. More specifically, it is a set of processes that include planning, acquiring, analyzing, and reporting relevant data, information, and insights to decision-makers in ways that mobilize the organization to take appropriate actions. These actions are designed to maximize performance and help accomplish organizational goals. Typically, the overall process is divided into the following stages:

1. Clarify the research question.
2. Design the research.
3. Collect and prepare the data.
4. Analyze and interpret the data.
5. Report insights and recommendations.

Exhibit 1-3 provides a graphic of the process that we will develop in this text. At times, a manager may start his or her journey at the beginning and proceed stage-by-stage to its culmination. At other times, a manager may need only a portion of the process, given information that is available from

>**Exhibit 1-3** The Research Process



>snapshot

Research on Cyber Security

How does research keep an organization secure from criminal "bad actors" in the cyber security arena? It's used to spot the threat before it happens, to understand an organization's vulnerabilities, to spot the attack venues, and more.

Over the last decade, cyber attacks have become more frequent, more sophisticated, more complex, and easier for the bad actors, all at the same time. New digital tools make it possible for these criminals to do tasks that just recently would require sophisticated programming expertise. Today, they can purchase whatever tools they need from criminal networks using Bitcoin, a digital currency that makes tracking the purchase and finding the criminal very difficult. As Richard Cassidy, cyber security evangelist with Alert Logic, one of the nation's leading managed security providers, explains, "Companies are vulnerable from three types of bad actors. Not all pose the same degree of damage." *Hacktivists* have a political or social agenda, and garnering media attention is their goal; *cyber criminals* may also want the media attention, but they seek monetary gain from the data they capture; ***advanced persistent threats*** (APTs) are the most dangerous and spend significant time, money, and resources prior to crafting a target-specific attack and do so for significant monetary gain and/or damage to the target.

From research, Alert Logic discovered that passwords (49.9 percent) and email addresses (45.5 percent) remain the prize target of bad actors, along with usernames (37.7 percent) and names (29.4 percent). Using this stolen information in combination with information readily available on company websites and social media sites like LinkedIn, a bad actor can obtain access to servers, databases, web domains, and more.

Joe Prachatree/Shutterstock

Attacks via phishing emails and software application plug-ins are the chief avenues of access to deliver malware. A phishing email is disguised to appear as though from a trusted source—for example, another employee or your boss. A plug-in is a software component that adds a specific feature to an existing computer program. Employees today bring their own mobile devices to work and often use software that hasn't been rigorously evaluated for inappropriate plug-ins. Through these portals, malware (malicious software such as viruses, worms, Trojan horses, and spyware) can be injected into an organization's system.

"Bad actors often try out their approach before launching the real attack," claimed Cassidy. So catching them in this preliminary test should be the goal. The problem is that it takes an organization, on average, 205 days to identify that it has been compromised, and by then, the purpose of the attack has been accomplished.

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a variety of other sources. Research is often characterized by much smaller datasets than big data. Once the research is presented, the manager has one very important decision: How shall he or she resolve the management problem?

Research and the Scientific Method

Intelligent, curious people who have a driving need to seek answers are at the heart of great research. The foundation of the business research process is the **scientific method**. The essential tenets of the scientific method are

- Clearly defined concepts, constructs, variables, methods, and procedures.
- Empirically testable hypotheses: a way exists to gather evidence that directly supports/refutes any hypothesis.
- Direct observation of phenomena (facts).
- Conclusions drawn from statistical evidence rather than inferred justification (educated guesses).
- The self-correcting process: ability to replicate and reassess validity of conclusions.

>The Language of Research

So where do we start to understand the bullet list above? We start with the language of research. When we do research, we seek to know "what is" in order to understand, explain, or predict phenomena. We might want to answer the question "What will be the department employees' reaction to a new flexible work schedule?" or "Why did the stock market price surge higher when all normal indicators suggested it would go down?" When dealing with such questions, we must agree on definitions. Which *employees* of the department: clerical or professional? What *reaction?* What are *normal indicators?* These questions require the use of concepts, constructs, operational definitions, and variables.

Concepts

A **concept** is a generally accepted collection of meanings or characteristics associated with certain events, objects, conditions, situations, or behaviors:

- Concepts are created when we classify and categorize events, objects, conditions, situations, or behaviors—identifying common characteristics beyond any single observation.
- Concepts are acquired through personal experience or the experience of others.
- Concepts use words as labels to designate them; these words are derived from our experiences.
- Concepts have progressive levels of abstraction—that is, the degree to which the concept does or does not have something objective to refer to. At one extreme are objective concepts; at the other, abstractions. *Table* is an objective concept. We have images of tables in our mind. *Personality* is an abstract concept as it is much more difficult to visualize.

Concepts are used to understand and communicate information. The success of research hinges on (1) how clearly we conceptualize and (2) how well others understand the concepts we use. We design hypotheses using concepts. We devise measurement scales using concepts by which to test these hypotheses. We gather and analyze data using measurement concepts.

Think of this concept: movie ticket. What comes to mind is not a single example, but your collected memories of all movie tickets from which you define a set of specific and definable characteristics (material, movie title use, perforation, multiple parts, screen location, etc.). For another example, assume you see a man passing and identify that he is running rather than walking, skipping, crawling, or hopping. Each movement represents a different concept. We also use concepts to identify that the moving object is an adult male rather than a truck or a horse.

Ordinary concepts make up the bulk of communication in research. *Ordinary,* however, does not mean *unambiguous.* We might, for example, ask research participants for an estimate of their family's total income. *Income* may seem to be a simple, unambiguous concept, but we will receive varying answers and confusing data unless we restrict or narrow the concept by specifying

- Time period, such as weekly, monthly, or annually.
- Before or after income taxes are deducted.
- For the household's highest wage earner only or for all household members.
- For salary and wages only or also including tips, bonuses, dividends, interest, and capital gains.
- To include or not include in-kind income (e.g., free rent, employee discounts, vacations, or food stamps).

We run into difficulty when trying to deal with less ordinary phenomena or advance new ideas. One way to handle this problem is to borrow a concept from another language or from another field. Assume we are researching a brand logo's design strength. We can borrow the term *gestalt* from German, which translates as form or shape and means an organized whole more than the sum of its parts.[15] Or we might use the physics concept of *gravitation* to explain why people shop where they do or the geographic concept of *distance* to describe degree of variability between the attitudes of employees on a new work schedule.

Sometimes we need to make a word cover a different concept or develop new labels for a concept. When we adopt new meanings or develop new labels, we begin to develop a specialized language or jargon. While jargon contributes to efficiency of communication among specialists or a particular group, it excludes everyone else. Jargon is often avoided in business research for this reason unless the sample is very narrowly defined.

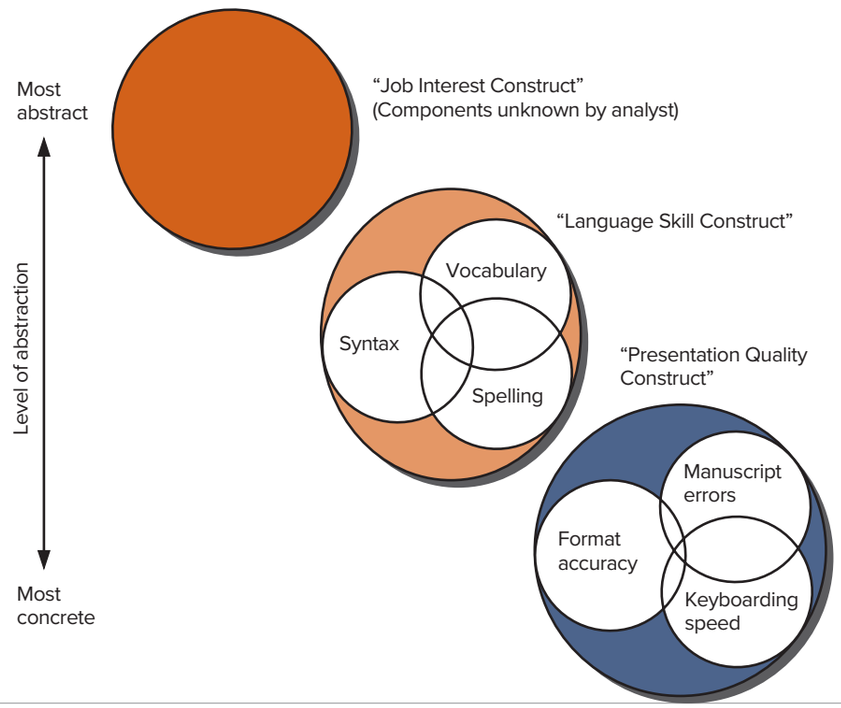
Constructs

When research requires us to work with abstract concepts, we define one or more constructs. A **construct** is an abstract idea specifically invented for a given research and/or theory-building purpose. We build constructs by combining simpler, more concrete concepts, especially when the idea or image we intend to convey is not subject to direct observation. Consider this example: Heather is a human resource analyst at CadSoft, an architectural software company that employs technical writers to write product manuals, and she is analyzing task attributes of a job in need of redesign.

Exhibit 1-4 illustrates some of the concepts and constructs Heather is dealing with. The concepts at the bottom of the exhibit (format accuracy, manuscript errors, and keyboarding speed) define a construct that Heather calls "presentation quality." Presentation quality is not directly observable. It is an invented construct, used to communicate the combination of meanings presented by the three objective, measurable concepts that Heather has discovered are related empirically. She is able to observe keyboarding speed, for example, by timing a person's entry of a paragraph.

Concepts at the next higher level of abstraction in Exhibit 1-4 are vocabulary, syntax, and spelling. Heather also finds them to be related. They form a construct that she calls "language skill." She has chosen this label because the three concepts together define the language requirement in the job description. Language skill is placed at a higher level of abstraction in the exhibit because two of the concepts it comprises, vocabulary and syntax, are more difficult to observe and their measures are more complex. Heather has not yet defined the last construct, "job interest." It is the least observable and the most difficult to measure. It will likely be composed of numerous

>Exhibit 1-4 Constructs Composed of Concepts in a Job Redesign



>picprofile

Some concepts need operating definitions to get accurate responses in research. In the Food and Drug Administration's *National Youth Tobacco Survey,* researchers needed to distinguish between *any tobacco use* and *e-cigarette use.* "Any tobacco product use" was defined as "use of one or more of the following tobacco products on ≥1 day in the past 30 days: cigarettes, cigars (defined as cigars, cigarillos, or little cigars), smokeless tobacco (defined as chewing tobacco, snuff, or dip), e-cigarettes, hookahs, tobacco pipes, snus, dissolvable tobacco, and bidis." www.cdc.gov

VICTOR DE SCHWANBERG/Getty Images

concepts—many of which will be quite abstract. Highly abstract constructs can be inferred only from the data; these are presumed to exist but must await further testing and definition. Heather will have the beginning of a **conceptual scheme** if research shows the concepts and constructs in this example to be interrelated and if their connections can be supported. In graphic form, the conceptual scheme depicts the relationships among the knowledge and skill requirements necessary to clarify the job redesign effort.

Operational Definitions

Confusion about the meaning of constructs or concepts can destroy a research study's value without the knowledge of the researcher or its sponsor. Definitions are one way to reduce this danger.

Researchers distinguish between dictionary definitions and operational definitions. In the more familiar dictionary definition, a concept is defined with a synonym. For example, a customer is defined as a patron; a patron, in turn, is defined as a customer or client of an establishment; a client is defined as one who employs the services of any organization or a patron of any shop.[16] These circular definitions may be adequate for general communication but not for research. In research, we measure concepts and constructs, and this requires more rigorous operational definitions.

An **operational definition** is a definition stated in terms of specific criteria for measurement or testing. We must be able to count, measure, or in some other way gather the information through our senses. Whether the object to be defined is physical (e.g., a can of soup) or highly abstract (e.g., achievement motivation), the definition must specify the characteristics and how they are to be observed. The specifications and procedures must be so clear that any competent person using them would classify the object in the same way.

To do this, you need operational definitions. Operational definitions may vary, depending on your purpose and the way you choose to measure them. College undergraduates are grouped by *class.* No one has much trouble understanding such terms as *senior, junior, sophomore,* and so forth. But the task may not be that simple if you must determine which students comprise each class. Here are two different situations involving a survey among students where we want to classify their answers by their class level. Each uses a different definition of the same concept:

1. You ask them to report their class status and you record it. In this case, class is freshman, sophomore, junior, or senior; you accept the answer each respondent gives as correct. The operational definition for class: how the student themselves classify their class.

2. You ask them to define their class by registrar guidelines. The operational definition for class: semester hours of credit completed by the end of the prior spring semester and recorded in each student's record in the registrar's office:

   - Freshman Fewer than 30 hours' credit
   - Sophomore 30 to 59 hours' credit
   - Junior 60 to 89 hours' credit
   - Senior 90 or more hours' credit

These examples deal with relatively concrete concepts, but operational definitions are even more critical for constructs. Suppose one tries to measure a construct called "socialization." Are we referring to someone's level of activity on Facebook and other social media, whether they like to entertain, or whether they can converse with others? We would probably develop questions on access, posts, sharing, likes, etc., in the first instance; the number of times and the types of entertaining they do for the second; and the number, types of language used, and types of reactions received for the third as we grapple with the operational definition. We may use a measurement approach already developed and validated by other researchers or create our own. The measurement approach chosen operationally defines the construct.

We may need to provide operational definitions for only a few critical concepts or constructs, but these will almost always be the definitions used to develop the relationships found in hypotheses and theories.

Variables

For this section, let's assume that the management dilemma we face is declining worker productivity. The research will explore the effect on employee productivity of shortening the working week from five to four days. A **variable** is a measurable symbol of an event, act, characteristic, trait, or attribute.[17] In practice, one or more variables are used as a substitute for a concept or construct. As researchers are interested in relationships among concepts and constructs, researchers are interested in relationships among variables. Variables come in various types: independent, dependent, moderating, and extraneous (including control, confounding, and intervening). We'll expand this list when we get into the concept of measurement.

Independent and Dependent Variables

The **dependent variable (DV)** is of primary interest to the researcher; it is measured, predicted, or otherwise monitored and is expected to be affected by manipulation of an **independent variable (IV)**, another variable of primary interest.

In each relationship, there is at least one independent variable (IV) and one dependent variable (DV). As one writer notes: Researchers hypothesize relationships of independence and dependence: They invent them, and then they try by reality testing to see if the relationships actually work out that way.[18]

The introduction of a four-day working week (IV) will lead to higher productivity (DV).

The assignment of the variable type (dependent vs. independent) depends on the assumed relationship the researcher is studying. As we are interested in studying the impact of the length of the working week on productivity, the length of working week is the IV. If you were focusing on the relationship between age of the worker and productivity, then age would be the IV. Exhibit 1-5 lists some terms that have become synonyms for *independent variable* and *dependent variable.* Although it is easy to establish whether an IV influences a DV, it is much harder to show that the relationship between an IV and DV is a causal relationship.

Exhibit 1-6 summarizes the many variable types, while Exhibit 1-7 graphically shows their relationship to each other using an example. Researchers recognize that there are often several independent variables that might be studied and that they are probably at least somewhat related and, therefore, not independent among themselves. When we study simple relationships, all other variables are considered unimportant and are ignored by the researcher. But for more complex relationships, researchers must identify those variables and choose a research design that measures those variables.

>**Exhibit 1-5** Independent and Dependent Variables: Synonyms

Independent Variable	Dependent Variable
Predictor	Criterion
Presumed cause	Presumed effect
Stimulus	Response
Predicted from . . .	Predicted to . . .
Antecedent	Consequence
Manipulated	Measured outcome

In Exhibit 1-7a, a causal relationship is illustrated by an arrow pointing from the independent variable to the dependent variable.

Moderating Variables

A **moderating variable (MV)** is a second independent variable believed to have a *significant* contributory effect on the original IV–DV relationship. For example, one might hypothesize that in an office situation:

> The introduction of a four-day working week (IV) will lead to higher productivity (DV), especially among younger workers (MV).

In Exhibit 1-7a, the arrow pointing from the moderating variable to the arrow between the IV and DV shows the difference between an IV directly affecting the DV and an MV affecting the relationship between an IV and the DV. In this case, the researcher hypothesizes that a different relationship between the four-day week and productivity might result from age differences among the workers. Hence, after introduction of a four-day working week, the productivity gain for younger workers is compared with that for older workers. For example, let's assume that the productivity of younger workers is 12 percentage points higher than that for older workers before the introduction of the four-day working week. Assume that the productivity of all workers having a four-day working week is six percentage points higher than for those of workers having a five-day working week. If the productivity of a younger worker having a four-day working week is only 18 percentage points higher than the productivity of an older worker, there is no moderating effect ($12 + 6 = 18$), because the 18 percentage points are the sum of the main effects and the moderating effect should show a surplus. However, if the productivity of younger workers was 25 percentage points higher, then the moderating effect of a worker's age would be obvious.

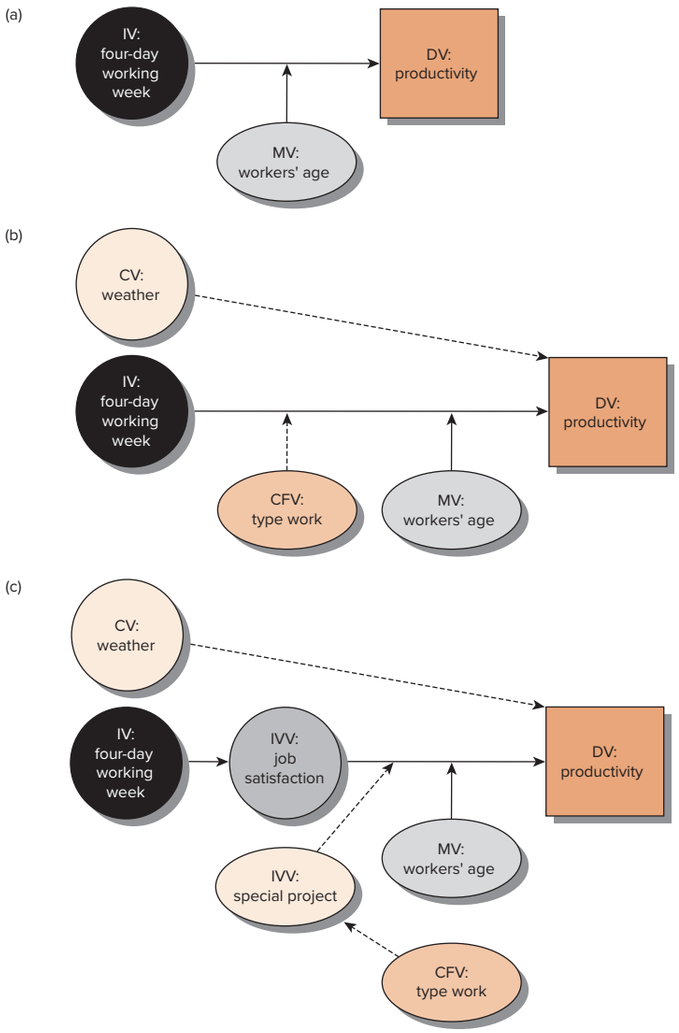
Other Extraneous Variables

An almost infinite number of **extraneous variables (EVs)** exist that might conceivably affect a given relationship. Taking the example of the effect of the four-day working week again, one would normally

>**Exhibit 1-6** A Summary of Variable Types

Variable Type	Symbol	Presumed Effect on IV-DV Relationship	Action Needed
Dependent	DV	Concept/construct of interest	Measure
Independent	IV	Primary variable believed to have significant effect on DV	Manipulate
Moderating	MV	Alternative IV; possible *significant* contributory effect on IV-DV	Measure
Control	CV	Might influence the IV-DV, but effect is not at the core of the problem studied	Ignore; effect is randomized
Confounding	CFV	Alternative IV; unknown effect on IV-DV	Measure
Intervening	IVV	Theoretically might affect; effect can't be determined	Infer effect from IV and MV on DV

>Exhibit 1-7 Relationships among Types of Variables



think that weather conditions, the imposition of a local sales tax, the election of a new mayor, and thousands of similar events and conditions would have little effect on work-week length and productivity. Most can safely be ignored because their impact occurs in such a random fashion as to have little effect. Others might influence the DV, but their effect is not at the core of the problem we investigate. **Control variables (CV)** are extraneous variables that we measure to determine whether they influence our results, as we want to make sure our results are not biased by excluding them. In Exhibit 1-7b, weather is shown as a CV; the broken line indicates that we included it in our research hypothesis because it might influence the DV, but we consider it irrelevant for the investigation of our research problem.

Extraneous variables can also be **confounding variables (CFVs)** to our hypothesized IV–DV relationship, similar to moderating variables. You may consider that the kind of work being done might have an effect on the impact of workweek length on productivity; productivity gains might not be universal across all types of work. This might lead you to introducing *type of work* as a confounding variable (CFV). In our example, we would study the effect of the four-day working week within groups (e.g., office workers vs. manufacturing workers vs. distribution plant workers). In Exhibit 1-7b, we included the type of work as a CFV, with a broken line.

Intervening Variables

The variables mentioned with regard to causal relationships are concrete and clearly measurable—that is, they can be seen, counted, or observed in some way. Sometimes, however, one may not be completely satisfied by the explanations they give. Thus, while we may recognize that a four-day workweek results in higher productivity, we might think that this is not the whole story—that workweek length affects some other variable that, in turn, results in higher productivity. The **intervening variable (IVV)** is a factor that theoretically affects the DV but cannot be observed or has not been measured; its effect must be inferred from the effects of the independent and moderating variables on the observed phenomenon.[19] In our example, one might view the intervening variable (IVV) to be job satisfaction, giving a hypothesis such as

The introduction of a four-day working week (IV) will lead to higher productivity (DV) by increasing job satisfaction (IVV).

Here we assume that a four-day workweek increases *job satisfaction;* similarly, we can assume that the introduction of *special project* work might influence productivity. Exhibit 1-7c illustrates how theoretical constructs, which are not directly observed, fit into our model.

Hypotheses, Theories, and Models

Hypotheses, theories, and models serve researchers in different ways but are related.

- A **hypothesis** is an unsubstantiated assumption about the relationship between concepts and constructs; it drives the research.
- A **theory** comprises data-tested, supported hypotheses; it is derived from research.
- A **model** is a visualization of a theory; it is used for clarification and to enhance understanding.

Hypotheses

At the core of any good research, then, is a carefully constructed hypothesis. A hypothesis can be phrased as a declarative statement (descriptive) or a question about the relationship between two or more concepts or constructs that may be judged as true or false (it's an unproven assumption at this point). It is always conjecture and formulated for empirical testing/measurement.

Descriptive format	Question format
American cities are experiencing budget difficulties due to a decline in manufacturing.	Is a decline in manufacturing causing the budget difficulties experienced by American cities?

Because it drives the research, crafting a hypothesis serves several important functions:

- It encourages researchers to think about the likely relationships to be found.
- It encourages researchers to think about the relevant facts (those needed to support or reject the hypothesis) and those facts that are not relevant.
- It suggests which research design is likely to be most appropriate.
- It is useful for testing statistical significance.
- It provides a framework for organizing the conclusions that result from the research.

To consider specifically the role of the hypothesis in determining the direction of the research, suppose we use this example:

Husbands and wives agree on their respective roles in vehicle purchase decisions.

The hypothesis specifies who shall be studied (married couples), in what context they shall be studied (their vehicle purchase decision-making), and what shall be studied (their individual perceptions of their roles). This hypothesis suggests that the best research design is a communication-based study, either a survey or interview. We have at this time no other practical means to ascertain perceptions of

people except to ask about them in one way or another. In addition, we are interested only in the roles that are assumed in the vehicle purchase decision. The study should not, therefore, seek information about roles husbands and wives might assume in other purchase decisions—say, electronics or furniture or movies. A study based on this hypothesis might reveal that husbands and wives disagree on their perceptions of roles, but the differences may be explained in terms of some factor(s) other than gender (i.e., mechanical knowledge, passion for cars, age, social class, religion, personality, etc.).

Types of Hypotheses There are numerous types of hypotheses. A **descriptive hypothesis** states the existence, size, form, or distribution of some concept/construct. For example, "The life expectancy of airplane Model 707 exceeds 16 years."

A relational hypothesis describes a relationship between two or more concepts/constructs. Each relationship describes a correlational or causal relationship. With **causal hypotheses** one variable being studied is assumed to cause a specific effect on other variables studied. With **correlational hypotheses** the variables being studied occur together, but there is no assumption of causation. For example:

- Women older than 50 (concept) purchase (concept) more or less of our product (concept) than those younger than 25 (concept). [correlational (neutral) relationship]
- Students who attend class regularly (construct) earn higher grades (concept) than those who do not attend regularly (construct). [correlational (positive) relationship]
- U.S. brand cars (concept) are perceived by American consumers (construct) to be of lesser quality (construct) than foreign brand cars (concept). [correlational (negative) relationship]

In the first example we hypothesize that the two groups purchase different levels of our product. In the second, there may be other factors that influence grades; it might be the amount of studying. In the last example, we hypothesize that "country of origin" (concept) influences "perceived quality" (construct), but we don't know what factors cause "perceived quality." Correlational hypotheses are often made when we believe there are more basic causal forces that affect the concepts/constructs (e.g., maybe a lack of product recalls causes high perceived quality) or when we do not have enough evidence to claim a stronger linkage.

Causal hypotheses not only predict the cause (cause means roughly to "help make happen") but also the effect. Here are three examples of causal hypotheses:

1. An increase in the price of salvaged copper wire (concept/cause) leads to an increase in scavenging in abandoned homes (construct/effect).
2. Exposure to a company's message concerning recent injuries (concept/cause) leads to more favorable attitudes among employees toward safety (construct/effect).
3. Loyalty to a particular grocery store (construct/cause) leads to purchasing that store's private brands (concept/effect).

In proposing or interpreting causal hypotheses, the researcher must consider the *direction* of influence. One would assume the price of copper wire influences scavenging rather than the reverse. One would also assume that the measure of attitude follows the release of the information about on-the-job injuries. Sometimes our ability to identify the direction of influence depends on the research design. Store loyalty and purchasing of store brands appear to be interdependent. Loyalty to a store may increase the probability of someone buying the store's private brands, but satisfaction with the store's private brand may also lead to greater store loyalty.

Reasoning and Hypotheses Every day we reason with varying degrees of success. **Reasoning**—gathering facts consistent with the management dilemma, proposing and eliminating rival hypotheses, measuring outcomes, developing crucial empirical tests, and deriving the conclusion—is pivotal to much of a researcher's success. Two types of reasoning are of great importance to research in forming and testing hypotheses: induction and deduction.

Induction Researchers use induction to craft hypotheses. In **induction**, you start by drawing a conclusion from one or more particular facts or pieces of evidence. The conclusion explains the facts, and the facts support the conclusion. To illustrate, suppose your firm spends $10 million on a regional promotional campaign and sales do not increase; these are facts. Under such circumstances, we ask, "Why didn't sales increase?"

One likely answer to this question is that the promotional campaign was poorly executed (conclusion). This conclusion is an induction because we know from experience that regional sales should go up during a promotional event. Also we know from experience that if the promotion is poorly executed, sales will not increase. The nature of induction, however, is that the conclusion is only a hypothesis. It is *one* explanation, but there are others that fit the facts just as well. For example, each of the following hypotheses might explain why sales did not increase:

- A strike by the employees of our trucking firm prevented stock from arriving at retailers; regional retailers did not have sufficient stock to fulfill customer orders during the promotional period.
- A competitor lowered its price during the promotional period; customers bought their brand rather than ours.
- A category-five hurricane closed all our retail locations in the region for the 10 days during the promotion.

In this example, we see the essential nature of inductive reasoning. The inductive conclusion is an inferential leap beyond the evidence presented—that is, although one conclusion explains the fact of no sales increase, other conclusions also might explain the fact. It may even be that none of the conclusions we advanced correctly explain the failure of sales to increase.

For another example, let's consider the situation of Tracy Nelson, a salesperson at the Square Box Company. Tracy has one of the poorest sales records in the company. Her unsatisfactory performance prompts us to ask the question, "Why is she performing so poorly?" From our knowledge of Tracy's sales practices, the nature of box selling, and the market, we might conclude (hypothesize)

- Tracy makes too few sales calls per day to build a good sales record.
- Tracy's territory does not have the market potential of other territories.
- Tracy's sales-generating skills are so poorly developed that she is not able to close sales effectively.
- Tracy does not have authority to lower prices and her territory has been the scene of intense price-cutting by competitive manufacturers, causing her to lose many sales to competitors.
- Some people just cannot sell boxes, and Tracy is one of those people.

Each of the above hypotheses has some chance of being true, but we would probably have more confidence in some than in others. All require further confirmation before they gain our confidence. Confirmation comes with more evidence. The task of research is largely to (1) determine the nature of the evidence needed to confirm or reject hypotheses and (2) design methods by which to discover and measure this other evidence.

Apply deductive reasoning to this image. Develop your own conclusion concerning what will happen next.

Alex Brylov/Shutterstock

Deduction Researchers use deduction to plan research and draw insights from data that will test hypotheses. **Deduction** is a form of reasoning that starts with one or more true premises and the conclusion flows from the premises given. For a deduction to be correct and sound, it must be both true and valid:

- Premises (reasons) given for the conclusion must agree with the real world (true).
- The conclusion must necessarily follow from the premises (valid).

A deduction is valid if it is impossible for the conclusion to be false if the premises are true. For example, consider the following simple deduction:

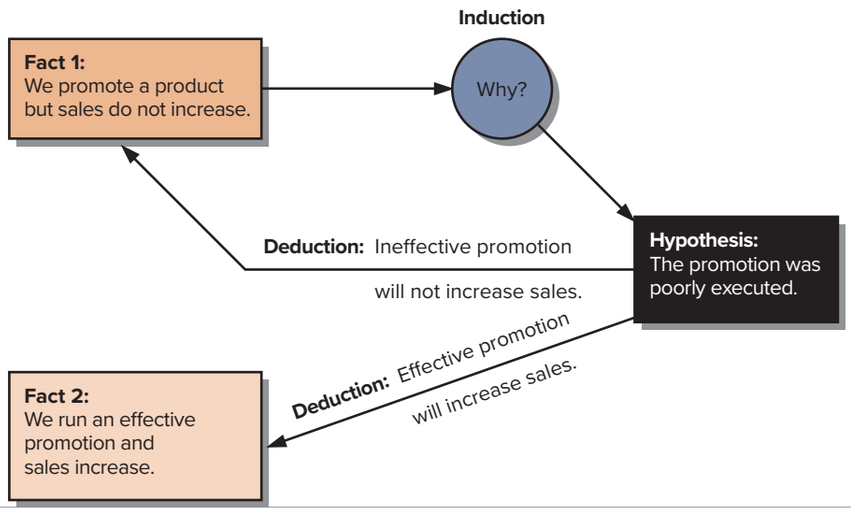
- All employees at BankChoice can be trusted to observe the ethical code. (Premise 1)
- Sara is an employee of BankChoice. (Premise 2)
- Sara can be trusted to observe the ethical code. (Conclusion)

If we believe that Sara can be trusted, we might think this is a sound deduction. But this conclusion cannot be a sound deduction unless the form of the argument is valid and the premises are true. In this case, the form is valid, and premise 2 can be confirmed easily. However, trillions of dollars each year in confirmed global employee theft will challenge premise 1.[20] If one premise fails the acceptance test, then the conclusion is not a sound deduction. It should be apparent that a conclusion that results from deduction is, in a sense, already "contained in" its premises.[21]

Combining Induction and Deduction Induction and deduction are used together in research reasoning. John Dewey, psychologist and educational reformer, describes this process as the "double movement of reflective thought."[22] Induction occurs when we observe a fact and ask, "Why is this?" In answer to this question, we advance a tentative explanation (hypothesis). The hypothesis is plausible if it explains the fact (event or condition) that prompted the question. Deduction is the process by which we test whether the hypothesis is capable of explaining the fact. The process is illustrated in Exhibit 1-8:

1. You promote a product but sales don't increase. (Fact 1)
2. You ask the question "Why didn't sales increase?" (Induction)
3. You propose a hypothesis to answer the question: The promotion was poorly executed. (Hypothesis)
4. You use this hypothesis to conclude (deduce) that sales will not increase during a poorly executed promotion. You know from experience that ineffective promotion will not increase sales. (Deduction 1)

>Exhibit 1-8 Why Didn't Sales Increase



This example, an exercise in circular reasoning, points out that one must be able to deduce the initiating fact from the hypothesis advanced to explain that fact. A second critical point is also illustrated in Exhibit 1-8. To test a hypothesis, one must be able to deduce from it other facts that can then be investigated. This is what research is all about. We must deduce other specific facts or events from the hypothesis and then gather information to see if the deductions are true. In this example:

5. We deduce that a well-executed promotion will result in increased sales. (Deduction 2)
6. We run an effective promotion, and sales increase. (Fact 2)

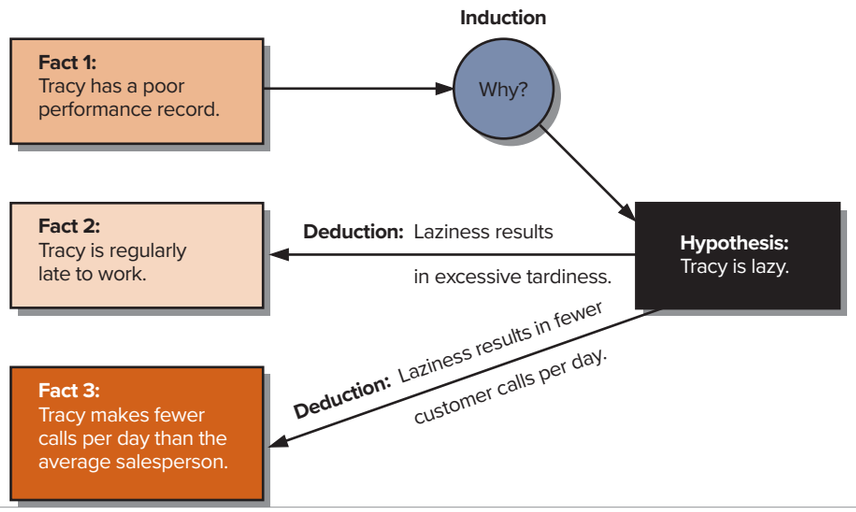
How would the double movement of reflective thought work when applied to the Tracy Nelson problem? The process is illustrated in Exhibit 1-9. The initial observation (fact 1) leads to hypothesis 1 that Tracy is lazy. We deduce several other facts from the hypothesis. These are shown as fact 2 and fact 3. We use research to find out if fact 2 and fact 3 are true. If they are found to be true, they confirm our hypothesis. If they are found to be false, our hypothesis is not confirmed, and we must look for another explanation.

In most research, the process may be more complicated than these examples suggest. For instance, we often develop multiple hypotheses by which to explain the manager's problem. Then we design a study to test all the hypotheses at once. Not only is this more efficient, but it is also a good way to reduce the attachment (and potential bias) of the researcher to any given hypothesis.

The steps that follow represent one approach to assessing the validity of conclusions about observable events.[23] These steps are particularly appropriate for business researchers whose conclusions result from empirical data. The researcher

1. Encounters a curiosity, doubt, barrier, suspicion, or obstacle.
2. Struggles to state the problem—asks questions, contemplates existing knowledge, gathers facts, and moves from an emotional to an intellectual confrontation with the problem.
3. Proposes a *hypothesis* (one plausible explanation) to explain the facts that are believed to be logically related to the problem.
4. *Deduces* outcomes or consequences of that hypothesis—attempts to discover what happens if the results are in the opposite direction of that predicted or if the results support the expectations.
5. Formulates several rival *hypotheses.*
6. Devises and conducts a crucial empirical test with various possible outcomes, each of which selectively excludes one or more hypotheses.
7. Draws a *conclusion* (an *inductive* inference) based on acceptance or rejection of the hypotheses.
8. Feeds information back into the original problem, modifying it according to the strength of the evidence.

>Exhibit 1-9 Why Is Tracy Nelson's Performance So Poor?



What Is a Strong Hypothesis? A strong hypothesis should fulfill three conditions:

1. Adequate for its purpose.
2. Testable.
3. Better than its rivals.

The conditions for developing a strong hypothesis are detailed more fully in Exhibit 1-10.

Theories

We have many theories and use them continually to explain or predict what goes on around us. To the degree that our theories are sound (empirically supported) and fit the situation, we are successful in our explanations and predictions. For example, it is midday and you note that outside the natural light is dimming, dark clouds are moving rapidly in from the west, the breeze is freshening, the barometric pressure is falling, and the air temperature is cooling but above 50 degrees. Would your understanding of the relationship among these concepts/constructs (your weather theory) lead you to predict that it will rain?

A *theory* is an empirically supported description of the relationships among concepts, constructs, and hypotheses that are advanced to explain or predict phenomena. A theory, therefore, is comprised of data-tested, supported hypotheses; it is derived from research. Our ability to make rational decisions is based on our ability to develop theory. But a caution: No theory can ever be considered final because it is subject to challenge by new data.

In marketing, for example, the product life cycle theory describes the stages that a product category goes through in the marketplace.[24] It was developed based on observing thousands of product introductions and their success path over time. The generalized product life cycle has four stages: introduction, growth, maturity, and decline. In each stage, many concepts, constructs, and hypotheses describe the influences that change revenue and profit. Definitions are used for communicating

>Exhibit 1-10 Checklist for Developing a Strong Hypothesis

Criteria	Interpretation
Adequate for Its Purpose	1. Does the hypothesis reveal the original problem condition? 2. Does the hypothesis clearly identify facts that are relevant and those that are not? 3. Does the hypothesis clearly state the condition, size, or distribution of some variable in terms of values meaningful to the research problem (descriptive)? 4. Does the hypothesis explain facts that gave rise to the need for explanation (explanatory)? 5. Does the hypothesis suggest which form of research design is likely to be most appropriate? 6. Does the hypothesis provide a framework for organizing the conclusions that result?
Testable	1. Does the hypothesis use acceptable techniques? 2. Does the hypothesis require an explanation that is plausible given known physical or psychological laws? 3. Does the hypothesis reveal consequences or derivatives that can be deduced for testing purposes? 4. Is the hypothesis simple, requiring few conditions or assumptions?
Better Than Its Rivals	1. Does the hypothesis explain more facts than its rivals? 2. Does the hypothesis explain a greater variety or scope of facts than its rivals? 3. Is the hypothesis one that informed judges would accept as being the most likely?