# *Exploring Marketing Research 11th edition Babin Solutions Manual*

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# Chapter 2

# Harnessing Big Data into Better Decisions

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## LEARNING OUTCOMES

1. Know why concepts like data, big data, information, and intelligence represent value.
2. Understand the four characteristics that describe data.
3. Know what a decision support system is and the technology tools that help make it work.
4. Recognize some of the major databases and how they are accessed.
5. Understand the basic concept of marketing analytics and its potential to enhance decision-making.
6. Be sensitive to the potential ethical issues of tracking consumers' behavior electronically.

## CHAPTER VIGNETTE: Is Marketing Research Good for You?

Marketing has changed significantly as more and more firms have access to "big data" that allow researchers to predict individual consumer's behavior based on Internet usage, social networking, and other aspects of media consumption. Blue-Chip Marketing is a company that specializes in using this kind of data to predict behavior without ever having to ask a consumer directly about his or her preferences and lifestyle. These new approaches to research in marketing have significantly sped up the process, making decision making faster and easier than ever before.

## SURVEY THIS!

Students are asked to review the questionnaire they responded to last chapter and to consider the how the data gathered could help the decision making process at an educational institution or communications firm. Students are then instructed to print the questionnaire, and to write the variable names next to each question. These exercises should be saved for use in later chapters.

## RESEARCH SNAPSHOTS

- **Bringing Home the Bacon!**
  The use of big data can increase a firm's return on investment (ROI) by 15 to 20 percent. As a result, more and more firms are looking for marketing researchers who know how to analyze big data. This research snapshot looks at the usage of bacon in restaurant food. They found that when bacon is added to sandwiches and other dishes, sales increase. On the other hand, when bacon is added to desserts, there is no real increase in sales.

- **Big Data Gives and Takes Away**
  Big data can be used to both bring in more customers, and to turn potential customers away. A coffee shop may want to take advantage of GPS in smart phones to lure customers into the store to buy coffee. On the other hand, gambling casinos may want to use data to drive away gambling addicts, which are bad for the casino's image. Researchers should therefore approach big data as both a tool for attracting consumers and as a tool for avoiding those customers who would hurt the company's images.

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- **Can They Read My Mind?**
  What if a retail outlet could make a purchase for you, before you even placed an order? More and more firms are using predictive technology to anticipate what a customer may buy, based on past purchases and other variables. Amazon has a great deal of confidence in their predictive tools, to the point that they are considering making purchases for customers before the customer buys anything at all. The idea is controversial.

## TIPS OF THE TRADE

- Researchers should focus on relevance as the key characteristic of useful data.
- Do so by asking, "Will knowledge of some fact change some important outcome?"
- Automate data collection when possible to enhance data quality.
- Weigh the costs of technology investments against the benefits they will bring.
- Be mindful of ethical concerns when using today's sophisticated data mining techniques.

## OUTLINE

### I. INTRODUCTION

Marketing research plays an important role in making sense out of the glut of data now available. Today, technology allows businesses to more easily integrate research findings into marketing strategy and operations. **Big data**, which is large quantities of data taken from multiple, varied sources, allows companies to make decisions with far more information than they had access to in the past.

### II. DATA, INFORMATION, AND INTELLIGENCE EQUAL VALUE

A. Marketing managers make decisions based on the input received from research that will make or break the firm, so data, information, and intelligence all have the potential to create value to the firm through better decision making.
B. **Data** are simply facts or recorded measures of certain phenomena (things or events).
C. **Information** is data formatted (structured) to support decision-making or define the relationship between two or more data points.
D. **Market intelligence** is the subset of data and information that actually has some explanatory power enabling effective decisions to be made.
E. So, there is more data than information, and more information than intelligence.

### III. THE CHARACTERISTICS OF VALUABLE INFORMATION

A. **Relevance**
   1. **Relevance** reflects how pertinent these particular facts are to the situation at hand.
   2. Irrelevant data and information often creep into decision making.
   3. Relevant data are facts about things that can be changed, and if they are changed, it will materially change the situation.
      a. So the question is: ***Will a change in the data coincide with a change in some important outcome?***

B. **Completeness**
   1. **Information completeness** refers to having the right amount of information.

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2. Often incomplete information leads decision makers to conduct marketing research.

C. **Quality**
   1. **Data quality** is the degree to which data represent the true situation.
   2. High quality data are accurate, valid, and reliable, and they represent reality faithfully.
   3. Obtaining the same data from multiple sources is one check on its quality.
   4. Critical issue in marketing research

**D. Timeliness**
   1. **Timeliness** means that the data are current enough to still be relevant.
   2. Computer technology has redefined standards for timely information.
   3. **Market dynamism** represents the rate of change in environmental and competitive factors.

**E. Global Marketplace**
   1. The potential marketplace is the entire world.
   2. Large companies use a plethora of technology ranging from handheld tablets to satellites to gather and exchange data in an effort to keep track of business details globally.

## IV. DECISION SUPPORT SYSTEMS

A. Marketing research can be categorized on the four possible functions it serves in business:
   1. Foundational – answers basic questions such as what consumer segments should be served and with what types of products
   2. Testing – addresses things like new product concepts or promotional ideas
   3. Issues – examines how specific issues impact the firm
   4. Performance – monitors specific metrics including financial statistics like profitability and delivery times; this category is of most interest to decision support systems

B. A marketing **decision support system (DSS)** is a system that helps decision makers confront problems through direct interaction with computerized databases and analytical software programs.

C. The purpose is to store data and transform them into organized information that is easily accessible to marketing managers, enabling decisions to be made in minutes rather than days or weeks.

D. Modern decision support systems greatly facilitate **customer relationship management (CRM)**.
   1. A CRM system brings together lots of pieces of information about customers including sales data, market trends, marketing promotions and the way consumers respond to them, customer preferences and more.

E. **Database and Data Warehousing**
   1. A **database** is a collection of raw data arranged logically and organized in a form that can be stored and processed by a computer.
   2. **Data warehousing** is the process allowing important day-to-day operational data to be stored and organized for simplified access.
   3. **Data warehouse** is the multitiered computer storehouse of current and historical data.
   4. **Cloud storage** is data that is stored on devices that make the files directly available via the Internet.

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F. **Input Management**
   1. Input includes all the numerical, text, voice, and image data that enter the decision support system.
   2. Many functions within an organization provide input data.
   3. Input data can also come from external sources.
   4. Six major sources of data input:
      a. **Internal Records** – accounting reports of sales and inventory figures
      b. **Proprietary Marketing Research** is the gathering of new data to investigate specific problems.
      c. **Salesperson Input** – can alert managers to changes in competitors' prices and new-product offerings as well as customer complaints
      d. **Behavioral Tracking** – modern technology provides new ways of tracking human behavior
         i. Global positioning satellite (GPS) systems allow management to track the whereabouts of delivery personnel at all times.
         ii. Tracking can log actual customer behavior on the Internet.
         iii. **Scanner data** refers to the accumulated records resulting from point of sale data recordings. The term single-source data refers to the ability of these systems to gather several types of interrelated data (i.e., purchase and promotional activity at the time).
         iv. **Universal product codes**, which are the bar codes that stores use to scan merchandise as it is being sold, allow companies to record data each time a sale is made.
      e. **Web Tracking** – performed by marketing researchers to monitor trends and information posted by consumers that pertains to the company's brand or products
         i. **Search-engine optimizers** give researchers the ability to mine Internet data to provide consulting to firms who wish to move up the listing of hits for terms related to their product or category.
         ii. **Electronic data interchange (EDI)** systems integrate one company's computer system directly with another company's system.
         iii. **Open source information** is a term that captures structured data openly shared between companies.

**G. Networks and Electronic Data Interchange**
   1. **Electronic data interchange (EDI)** - type of exchange that occurs when one company's computer system is integrated with another company's system
   2. Many firms share information in an effort to encourage more innovation.
      a. **Open source information** is a term that captures structured data openly shared between companies

## V. DATABASE SOURCES AND VENDORS

A. Some organizations specialize in recording certain marketing and consumer information. In some cases, these companies make that data available either for free or for a fee.

B. **Data Archives**
   1. Many government agencies around the world are important sources of data.
   2. Numerous computerized search and retrieval systems and electronic databases are available as subscription services or in libraries.
   3. **Data Wholesalers** put together consortia of data sources into packages offered to municipal, corporate, and university libraries for a fee.

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4. **Data Retailers** sell data directly to the end consumer.
5. **Statistical Databases** contain numerical data for market analysis and forecasting.
   a. Often demographic, sales, and other relevant marketing variables are recorded by geographical area. These are called geographical databases.
6. **Financial Databases**
   a. CompuStat publishes an extensive financial database on thousands of companies, broken down by industry and other criteria.
7. **Video Databases**
   a. Video databases and streaming media are having a major impact on the marketing of many goods and services.

**C. The Internet and Research**

1. Navigating the Internet
   a. Parties that furnish information on the World Wide Web are called **content providers**.
   b. The **Uniform Resource Locator (URL)** is really just a Web site address that Web browsers recognize.
   c. A **keyword search** takes place as the search engine searches through millions of Web pages for documents containing the keywords.
   d. **Environmental scanning** entails all information gathering designed to detect changes in the external operating environment of the firm.

D. **Information Technology**

1. **Smart agent software** is capable of learning an Internet user's preferences and automatically searching out information and distributing the information to a user's computer.
2. **Push or Pull?** Data and information are delivered to consumers or other end users via either **pull technology** or **push technology**.
   a. **Pull technology:** Consumers request information from a Web page and the browser then determines a response; the consumer is essentially asking for the data.
   b. **Push technology:** Sends data to a user's computer without a request being made; software is used to guess what information might be interesting to consumers based on the pattern of previous responses.
3. **Near Field Communication (NFC) Devices**
   a. **RFID** stands for radio frequency identification. A tiny chip, which can be woven onto a fabric, placed in packaging, attached to a card, including credit cards, or otherwise affixed to virtually any product, sends a radio signal that identifies that particular entity uniquely.
   b. **NFC** is the abbreviation for near-field-communication or Wi-Fi-like systems communicating with specific devices within a defined space like inside of a retail unit or near a poster billboard.
4. **Cookies**
   a. Cookies, in computer terminology, are small data files that record a user's Web usage history.
5. **Intranets**
   a. **The Intranet** is a company's private data network that uses Internet standards and technology.
   b. The Mayo Clinic is widely recognized as having an effective Intranet

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### VI. MARKETING ANALYTICS

A. **Marketing analytics** is a general term that refers to efforts to measure relevant data and apply analytical tools in an effort to better understand how a firm can enhance marketing performance.
B. **Predictive analytics** refers to linking computerized data mined from multiple sources to statistical tools that can search for predictive relationships and trends.

### VII. DATA TECHNOLOGY AND ETHICS

A. Advances in data technology have in a way made privacy seem like a thing of the past.
B. **Geolocation technologies** allow your whereabouts and/or movement to be known through digital identification of some type, some of which we mentioned earlier when discussing near field communication.
C. Four factors relevant for considering the ethics of data gathered through digital means:
    1. Has the consumer implicitly or explicitly consented to being traced?
    2. Does the tracking behavior violate any explicit or implicit contracts or agreements?
    3. Can researchers enable users to know what information is available to data miners? Some companies, including a marketing data provider known as Turn, participate in an **open data partnership**. This partnership seeks to allow consumers access to the information collected from their digital interactions and even provides consumers an opportunity to edit the information.
    4. Do the benefits to consumers from tracking their behavior balance out any potential invasion of their privacy?
    5. **History sniffing** is a term for activities that covertly discover and record the web sites that a consumer visits without using cookies.

## QUESTIONS FOR REVIEW AND CRITICAL THINKING/ANSWERS

1. Define big data. How has big data created greater demand for people with research skills?

While there is considerable disagreement about just what comprises big data, we can think of it as large quantities of data taken from multiple, varied sources that were not intended to be used together, and that are available to be analytically applied to provide input to organizational decision making. Like the growth of marketing research that occurred in the early days of sophisticated computational devices, the advances in big data technology are leading to another surge in the growth of the marketing research industry. As a result, marketing researchers with strong analytical skills are in high demand. That growth is expected to create nearly 2,000,000 "big data" jobs by 2015.

2. What is the difference between data, information, and intelligence?

Data are simply facts or recorded measures of certain phenomena (things or events); information is data formatted (structured) to support decision making or define the relationship between two facts. Market intelligence is the subset of data and information that actually has some explanatory power enabling effective decisions to be made. So, there is more data than information and more information than intelligence.

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3. What are the characteristics of useful information?

Information can be evaluated by using four characteristics: relevance, quality, timeliness, and completeness. Relevance is the characteristic of data reflecting how pertinent these particular facts are to the situation at hand. Relevant data are facts about things that can be changed, and if they are changed, it will materially change the situation. Data quality is the degree to which data represent the true situation. High-quality data are accurate, valid, and reliable. High-quality data represent reality faithfully. Timeliness means that the data are current enough to still be relevant. Completeness refers to having the right amount of information.

4. What is the key question distinguishing relevant data from irrelevant data?

Relevant data are facts about things that can be changed, and if they are changed, it will materially change the situation. So, this simple question becomes important: "Will a change in the data coincide with a change in some important outcome?"

5. How is CRM used as input to a DSS?

Modern decision support systems greatly facilitate customer relationship management (CRM). A CRM system is the part of the DSS that characterizes the interactions between firm and customer. It brings together information about customers, including sales data, market trends, marketing promotions and the way consumers respond to them based on customer preferences. A CRM system describes customer relationships in sufficient detail so that managers, salespeople, customer service representatives, and perhaps the customers themselves can access information directly, match customer needs with satisfying product offerings, remind customers of service requirements, and know what other products a customer has purchased or might be interested in purchasing. CRM systems can compute the overall lifetime value of each customer. This data point often proves a key metric for triggering decisions.

6. Define RFID. How can it provide input to a DSS?

**RFID** stands for radio frequency identification. A tiny chip, which can be woven onto a fabric, placed in packaging, attached to a card, including credit cards, or otherwise affixed to virtually any product, sends a radio signal that identifies that particular entity uniquely. When the tag comes into proximity of a reader, the reader records the programmed information allowing products and/or consumers to be tracked virtually anywhere. Using this technology, managers can implement it in the marketing DSS, allowing them to make decisions based on the consumer behavior that is tracked with RFID technology.

7. What types of internal databases might one find in the following organizations?

    a. Hilton Hotels

Hilton Hotels will have the standard accounting records, of course, but they will also have information about the characteristics of each registered guest. They have the home address, destination on a trip, place of employment, perhaps the type of credit card used, and make of automobile. This will allow a great deal of direct mailing activity. Frequent visitor questionnaires and loyalty program information would also provide customer data. The databases could be used to determine market performance such as average percentage of capacity used on a seasonal or weekly basis. This would allow forecasting of future demand to allow discounts during "off" times and rationing to preferred customers at other times, as well as helping schedule extra or less personnel as needed.

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The occupancy-to-variable-labor ratio could be monitored to access productivity in specific areas. Comparison of occupancy rates before and after advertising and promotional efforts (adjusted for seasonal variations) could help measure the effectiveness of those expenditures. Finally, information can be gathered on room supply, guest ratings, and customers' preferences.

b. A Major University Athletic Department

This organization can maintain data on overall attendance statistics and season ticket holders, which can contain a substantial amount of specific, relevant data. Data can be used to assess the effectiveness of promotional activities (i.e., direct mail offers). Data can also be maintained on support of the athletic programs in the form of donations.

c. ABInbev

ABInbev (Anheuser-Busch) would have information concerning all the different types of package sizes, sales volume within regions, etc. Anheuser-Busch has a computerized shelf-space management program for its retailers that audit sales, margins, and turnover by brand and package. Further, to check on wholesaler performance, Anheuser-Busch has staff at headquarters record salesperson call frequency to each account, weekly and monthly sales of all beer, and shelf-space facings for all brands. Additionally, sales levels might help indicate advertising campaign effectiveness after adjusting for seasonal fluctuations. An extensive scanner database would exist for supermarket sales. Beer sales in taverns and liquor stores would most likely be kept using a different type of record keeping system.

d. Quibids (online auction web site)

Quibids would have internal databases that track each auction on its site, along with specific data about the bid patterns of each individual user, and the bid patterns of users in different markets. Using these data, Quibids can predict and forecast which auctions are the most likely to be successful. In addition, Quibids will probably track its Internet presence, and possibly utilize users' browsing history and past auction participation to show personalized auction listings.

e. iTunes

The iTunes internal database likely consists of each customer's purchase history, so that the software can make recommendations for users to purchase new music with which they are not familiar. Apple (the parent company of iTunes) also tracks overall sales, so that customers can see the top ten songs in any genre.

f. Facebook

Facebook is well known for tracking a tremendous amount of information from its users. It aggregates a user's likes, and then uses that data to tailor advertisements based on the person's unique preferences. A 2014 study was conducted, without users' knowledge or consent, about how negative posts affect a user's moods. This study was met with a great deal of controversy, because the research participants were not even aware that they were participating. Facebook's use of big data is a well covered topic, and a quick Internet search will yield a great deal of information.

8. What type of operational questions could a delivery firm like UPS expect to automate with the company's decision support system?

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While marketing research can perform four possible functions (i.e., foundational, testing, issues, and performance), the performance category is most likely of interest to UPS. Performance refers to research that monitors specific metrics including financial statistics like profitability and delivery times. The metrics that are monitored can be fed into automated decision making systems, and they can trigger reports that are delivered to managers. In this case, UPS can monitor its performance of on-time delivery, customer complaints, and profitability.

9. What makes a decision support system successful?

A marketing decision support system (DSS) is a system that helps decision makers confront problems through direct interaction with computerized databases and analytical software programs. Thus, a successful decision support system is one that stores relevant data and transforms them into organized information that is easily accessible to marketing managers.

10. What is data warehousing?

Data warehousing is a process that allows important day-to-day operational data to be stored and organized for simplified access. More specifically, a data warehouse is the multi-tiered computer storehouse of current and historical data. Data warehousing management requires that the detailed data from operational systems be extracted, transformed, placed into logical partitions, and stored in a consistent manner.

11. What is web tracking? Visit **http://www.kbb.com**. While there, choose two cars that you might consider buying and compare them. Which do you like the best? What would you do now? What are at least three pieces of data that should be stored in a data warehouse somewhere based on your interaction with *Kelly Blue Book*?

Web tracking involves tracking the behavior of customers online, so that information can be used to make management decisions. Student responses to the visit to Kelly Blue Book will vary, but the idea is to get them thinking about how their choices on this website influence the ads that will pop up as they browse the Internet. The three pieces of data would be the cars they looked at, whether those cars were used or new, and how long they spent looking at those cars.

12. Give three examples of computerized databases that are available through your college or university library.

Answers will vary. However, most libraries will have ProQuest, ABI/Inform, Compustat financial databases, the United States Census, and many other databases mentioned in the text.

13. Describe what smart agent software is and how it may affect you as a typical consumer.

Smart agent software is capable of learning an Internet user's preferences and automatically searching out information and distributing the information to a user's computer. Numerous vendors offer smart agent software for sale or lease. Companies that purchase software hope to leverage the information that consumers leave behind into more customized and therefore more effective sales appeals.

14. Describe marketing analytics role in assisting business decision making.

Marketing analytics is a general term that refers to efforts to measure relevant data and apply analytical tools in an effort to better understand how a firm can enhance marketing performance. Statistical tools are heavily involved in marketing analytics and they can help explain the way the company should respond to consumer information.

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15. What is predictive analytics? Think about your behavior in the last 48 hours. List at least 10 things that you've done which may have produced data that could be used as input into a predictive analytics system.

Predictive analytics refers to linking computerized data sources to statistical tools that can search for predictive relationships and trends, which allow more accurate predictions of consumers' opinions and actions. Student responses will vary according to their behaviors in the past 48 hours, but they should focus on those actions that generate data—website visits, online shopping, social media behavior, and so on.

16. Suppose a retail firm is interested in studying the effect of lighting on customer purchase behavior. Which of the following pieces of information is the least relevant and why?
    a. Amount of natural light in the store
    b. The compensation system for store salespeople
    c. The color of the walls in the store
    d. The type of lighting: fluorescent or incandescent

It would seem that the compensation system for store salespeople would be the least relevant piece of information because it has no impact on the lighting. The other factors could directly or indirectly influence the lighting in the store.

17. How could New Balance, a maker of athletic shoes, use a NFC device like iBeacon?

RFID technology could be embedded in the shoes to logistically track the flow of goods from the manufacturer to consumer. RFID could also be used to identify "real" New Balance shoes from counterfeit ones, so retailers can be assured that they are getting the real product. How consumers actually use the shoe can be assessed with other NFC devices, like an iBeacon. That is, do they just use them for exercise, or do they wear them for casual shoes? The length of time consumers keep the shoe could be assessed as well as the method of disposal.

18. What are four questions researchers can ask in deciding whether their electronic data gathering systems violate good ethical principles?

- Has the consumer implicitly or explicitly consented to being traced?
- Does the tracking behavior violate any explicit or implicit contracts or agreements?
- Can researchers enable users to know what information is available to data miners?
- Do the benefits to consumers from tracking their behavior balance out any potential invasion of their privacy?

## RESEARCH ACTIVITIES

1. Search the Internet and try to find the earliest use of the phrase "big data." Describe why the term has come to be used.

According to the New York Times, the earliest usage of the phrase "big data" is nearly impossible to nail down (http://bits.blogs.nytimes.com/2013/02/01/the-origins-of-big-data-an-etymological-detective-story/?_r=0). The best guess is that it began to be used in the mid 1990s.

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The term has come to be used in different ways, with no real consensus on what it means. For the purposes of this textbook, the term means the usage of large quantities of data taken from multiple, varied sources, and analytically applied to provide input for organizational decision making.

2. Use the Internet to see if you can find information to answer the following questions:
    1. What is the exchange rate between the $US and €Euro?
    2. What are four restaurants in the French Quarter in New Orleans?
    3. What is the most popular novel among teenage girls age 14-16?
    4. Do more people visit the foxnews.com or cnn.com web sites?

You can find the answers to all these using search engines such as Yahoo or Google. For example, using Google, students can search "exchange rate for US dollar and Euro" and get the current rate. Similarly, searching "New Orleans restaurants" brings up several options, such as Mother's, Emeril's, Galatore's, and so on. Finally, searching "popular novels for girls" brings up several sources of information. The "Clique," "Gossip Girl," "A-List," and "Twilight" series of books are popular with young teenage girls. Similarly, a more advanced search can give students an idea of how many hits the two news websites receive.

3. Casually interview two consumers at least 20 years different in age. Describe to them a use of big data such as the restaurant consumer who whose server knew she had worked out before coming to the restaurant just by data produced by her smartphone. How do they react? Is either concerned about the potential breech in privacy? Comment on your results.

Student responses will vary, but the idea is to get them thinking about how the average person feels about big data, and how it may affect their privacy.

## CASE 2.1 Harvard Cooperative Society

**Objective:** To encourage students to appreciate the importance and usefulness of a decision support system.

**Summary:** From his office window, Harvard Cooperative Society CEO, Jerry Murphy, can see customers shopping. They make their way through the narrow aisles of the crowded department store, picking up a sweatshirt here, trying on a baseball cap there, and checking out the endless array of merchandise that bears the Harvard University insignia. Watching Murphy, you can well imagine the Co-op's founders, who started the store in 1882, peering through the tiny windowpanes to keep an eye on the shop floor. Was the Harvard Square store attracting steady traffic? Were the college students buying enough books and supplies for the Co-op to make a profit? Back then, it was tough to answer those questions precisely. The owners had to watch and wait, relying only on their gut feelings to know how things were going from minute to minute.

Now, more than a hundred years later, Murphy can tell you, down to the last stock-keeping unit, how he's doing at any given moment. His window on the business is the PC that sits on his desk. All day long it delivers up-to-the-minute, easy-to-read electronic reports on what's selling and what's not, which items are running low in inventory and which have fallen short of forecast. In a matter of seconds, the computer can report gross margins for any product or supplier, and Murphy can decide whether the margins are fat enough to justify keeping the supplier or product on board. "We were in the 1800's, and we had to move ahead," he says of the $55 million business.

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## Questions

1. What is a decision support system? What advantages does a decision support system have for a small business like the Harvard Cooperative Society?

A marketing decision support system is a system that helps decision-makers confront problems through direct interaction with computerized databases and analytic software programs. The purpose of a decision support system is to store data and transform it into organized information that is easily accessible to marketing managers. Decision support systems serve specific business units within a company.

A decision support system is a sophisticated software program that analyzes the data an executive deems critical to his or her business and delivers the analyses to a computer screen as easy-to-read graphics and text reports. A decision support system can, for instance, spot a potential cash flow problem before it happens, enabling a CEO to avert a crisis. Or it can show that seasonal inventory is not moving as fast as it was last year, which might prompt a company president to reduce prices to avoid getting stuck with extra goods. Its ultimate purpose is to give executives the detailed information they need to assess the state of their company and make informed decisions.

2. How would the decision support system of a small business like the Harvard Cooperative Society differ from that of a major corporation?

Decision support systems are not new. Large corporations have been using them for years. What's changed is how much more available they are to small and growing businesses. Cheaper, easier-to-use desktop computers and software have brought the price of entry—including hardware, software, and technical help—down considerably. Most of the costs come not from the hardware or software but from the labor needed to organize the information so the software can read and analyze it.

Both large and small companies have a database (a collection of information that is arranged in a logical manner and organized in a form that can be stored and processed by a computer) and software in their decision support systems. A mailing list of customer names is one type of database that would be useful to both large and small businesses. The software portion of a decision support system consists of various types of programs that tell computers, printers, and other hardware what to do. Software consists of business intelligence systems, statistical software, spreadsheet software, and analytical models that combine and restructure databases, diagnose relationships, estimate variables, and otherwise analyze the data within the system.

The concept of a data warehouse is more relevant for large corporations than for small businesses.

3. Briefly outline the components of the Harvard Cooperative Society's decision support system.

The Harvard Co-op clearly has a database and software in their decision support system. The focus seems to be on collecting sales, inventory, and profit information. It seems adequate for the company's purpose.

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