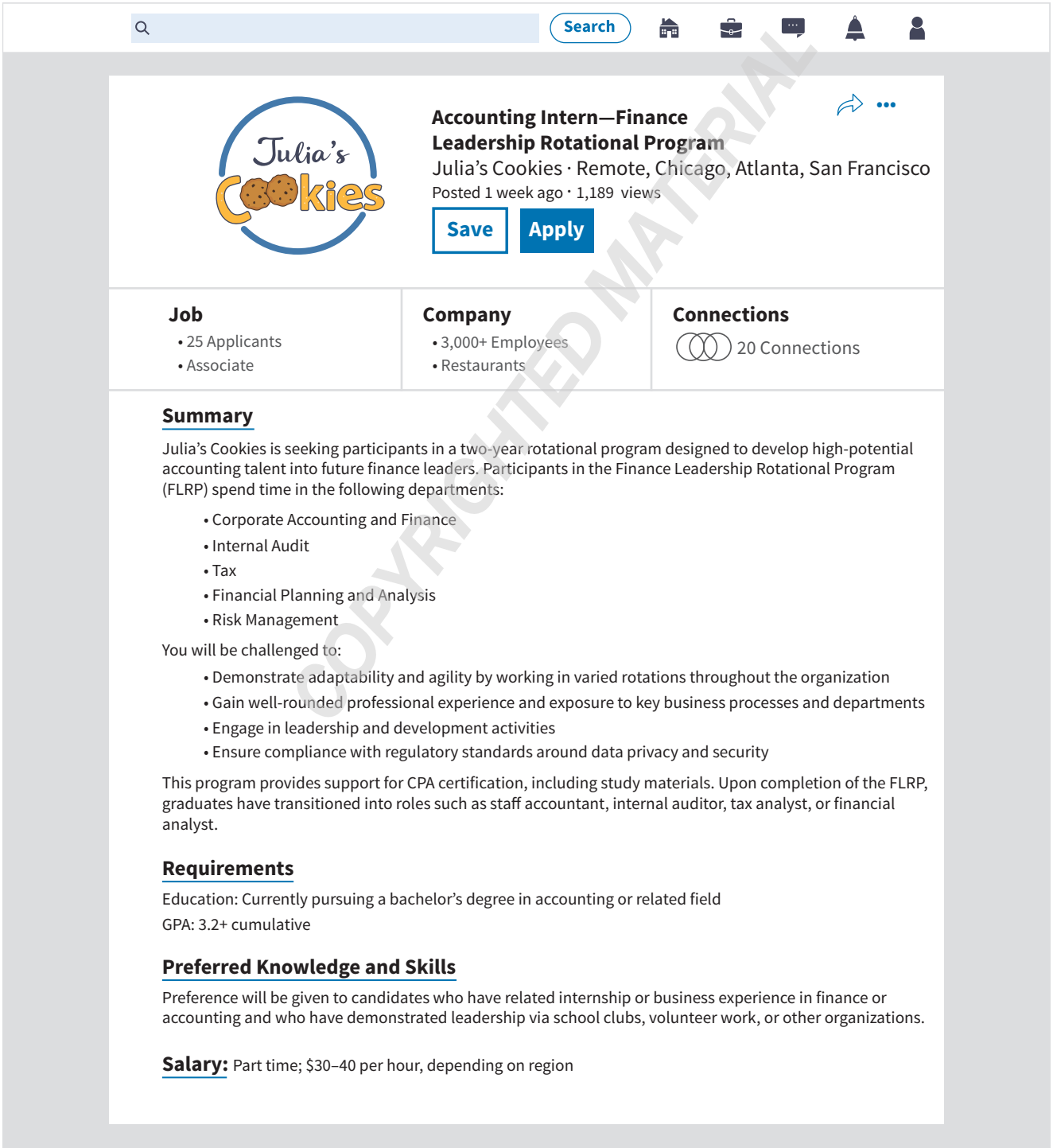
CHAPTER 1

Accounting as Information



CHAPTER PREVIEW

Like stereotypical bookkeepers and IRS auditors, the public often imagines accountants wearing pocket protectors and sitting in cubicles. In reality, accounting is at the center of every business. Accounting professionals use critical thinking to make decisions like categorizing, recording, and reporting accounting activities. As technology continues influencing how companies operate, accounting professionals are becoming more strategic in their focus—moving away from "crunching numbers" and following checklists toward becoming valuable advisors helping businesses meet their strategic objectives.

Accounting professionals make decisions using economic and business information to provide strategic value. In this chapter, you will learn about where this information comes from and why information systems are an integral part of operations, including:

- How an information system supports business operations
- How accounting information systems have evolved
- How management uses information
- The relationship between data analytics and accounting

This chapter also introduces a company, Julia's Cookies, that you will encounter throughout the course. Focusing on a single company will help you understand the big picture of how the key concepts in this course integrate and influence business operations. Although Julia's Cookies is fictitious, it is modeled after real-world businesses, and the scenarios in the course are based on the real-life experiences of accounting professionals. The Julia's Cookies' job postings that appear throughout the book, like the Finance Leadership Rotational Program intern posting at the beginning of the chapter, are based on actual job openings posted on online career websites such as LinkedIn. Companies post jobs just like this, and they are looking for accounting professionals just like you.

Chapter Roadmap

LEARNING OBJECTIVES	TOPICS	JULIA'S COOKIES APPLIED LEARNING
1.1 Explain how accounting affects both the demand for and supply of information.	• Good Information Leads to Good Decisions • Transforming Data into Information • Meet Julia's Cookies • Understanding Business Operations	Accounting Skills: Rotational Internship Candidates
1.2 Compare and contrast traditional transaction-based accounting systems with process-based information systems.	• Acquisitions and Payments Processes • Conversion Processes • Marketing, Sales, and Collections Processes	Acquisitions and Payments Processes: Ordering Flour
1.3 Explain management's relationship to information and information systems.	• Management's Responsibility for Business Processes • Data-Driven Decision Making	Useful Information: Selecting Relevant Data Points
1.4 Describe the relationship between accounting and data analytics.	• Reporting Versus Analytics • Data Analytics in Accounting • Data Analytics Skills	Accounting Analytics: Capturing Data from Business Events

CPA You will find the CPA tag throughout the chapter to call out any important topics you may see on the CPA exam.

1.1 Why Is Accounting Information Important?

Learning Objective 1

Explain how accounting affects both the demand for and supply of information.

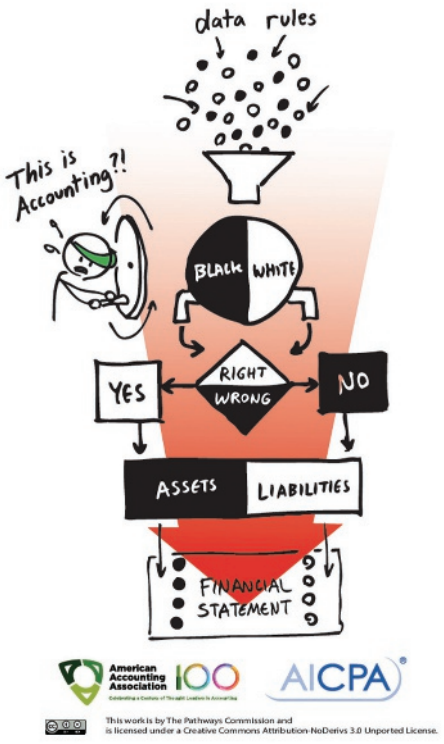


ILLUSTRATION 1.1 Accounting stereotypes lead to misconceptions about the kind of work accounting professionals perform.

Source: The Pathways Commission, Sponsored by the American Accounting Association and the American Institute of CPAs. CC BY-ND 3.0.

Do you remember your introductory accounting course and your first perception of accounting? Have you seen movies that portray accountants as boring or nerdy? What about the public perception of IRS auditors? **Illustration 1.1** shows some common accounting misperceptions[1]:

- Accountants are boring bean counters who "crunch numbers."
- Accounting is a mechanical process with rigid black-and-white rules and yes-or-no answers.
- Accountants focus on debits and credits and are removed from business events and activities.

These misperceptions could not be further from the truth. Auditors are not the police, ready to write you up for failing to perform your job. That misconception still exists in many companies today, and internal and external auditors alike are fighting to prove they are here to help and innovate—even using phrases like "trusted advisor" to rebrand themselves.

Good Information Leads to Good Decisions

We call accounting the "language of business" because it measures and communicates the financial outcomes of a company's business strategy for three crucial categories of business activities: operating, investing, and financing. The results of these measurements can exceed, meet, or fail to meet expectations. Management uses these outcomes to make plans and execute them accordingly.

The reality of accounting is that it:

- Requires knowledge of economic contexts to fuel accounting judgments
- Consists of a mix of rigid black-and-white rules and many shades of gray
- Provides a source of useful information for decision making
- Helps support a prosperous society
- Serves the public interest
- Demands strong critical-thinking skills

[1]We use, acknowledge, and appreciate the guidance provided by the American Accounting Association (AAA) and the AICPA's Pathways Commission in their Pathways Vision Model and accompanying explanatory materials.

Illustration 1.2 emphasizes the importance of critical-thinking skills for accounting professionals, which include (from the bottom up in the illustration):

- Using economic contexts to make accounting judgment calls for financial reporting. Generally accepted accounting principles (GAAP) allow for discretion in making accounting choices where there are shades of gray.
- Assessing the usefulness of reported accounting information resulting from these judgment calls.
- Making good business decisions based on this useful information.

Illustration 1.2 also shows both the demand for and supply of information, which often occur in real time due to technological advances. The arrows indicate a flow of cause and effect. The supply of information flows from the information preparers at the bottom to the information users and decision makers at the top. During this process, accounting professionals should make judgment calls on what most appropriately reflects the business reality of economic activity. For example, an accounting professional must understand and interpret whether to use FIFO, LIFO, or a weighted average method for inventory valuation (covered in financial accounting courses). These judgments affect the usefulness of information, which then affects the users' decisions. Good business decisions lead to a prosperous society, which is how accounting professionals serve the public interest.

We can also look at the arrows in reverse by emphasizing the demand for information, which starts at the top of the model with users seeking information about economic activity to help make decisions. Accounting has consequences. These decisions based on accounting information result in more economic activity, which starts the process over again.

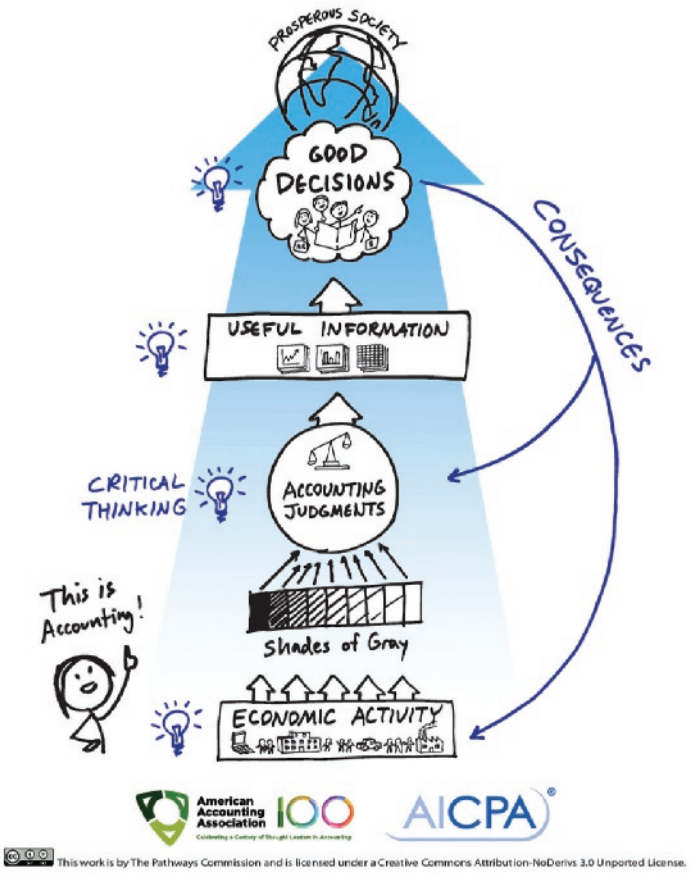


ILLUSTRATION 1.2 The Pathways Vision Model shows how accounting professionals use judgments to make good decisions.

Source: The Pathways Commission, Sponsored by the American Accounting Association and the American Institute of CPA. CC BY-ND 3.0.

It is important to note that the term "information system" can include all the people and **processes** involved in this supply of information. For this accounting information systems course, however, we use "information system" and "accounting information system" to reference computer systems, whose definitions follow.

Transforming Data into Information

CPA An **information system** consists of interrelated components, including physical hardware like monitors and laptops, the software that users interact with, databases used for storage, and networks that send data and information throughout the system. An information system also includes the people who use and maintain it. **Illustration 1.3** shows how an information system:

- Captures raw and unorganized data, which is the **input**
- Processes and stores that data (action)
- Reports information in formats that are useful to users, which is the **output**

You will learn about data later in the course, but for now, you need to know that data consists of facts or statistics about a person or an object, like a transaction, collected for reference or analysis. Data is useless to a business until it is transformed into information.

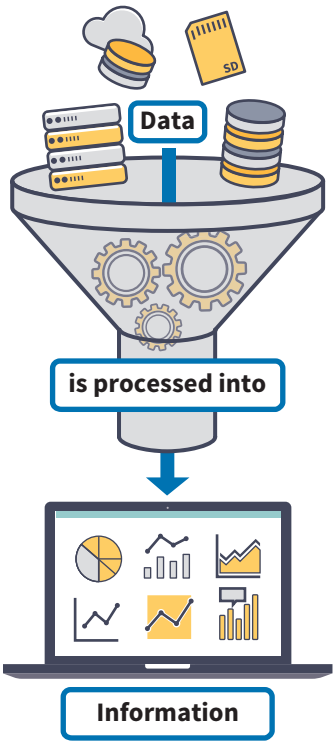


ILLUSTRATION 1.3 Data (input) is captured by an information system and then processed into useful information (output).

An **accounting information system (AIS)** performs the same data collection, transformation, and reporting as all other information systems, but it is specific to accounting and financial data:

- An AIS's informational output consists of accounting reports used by investors, tax authorities, creditors, and other stakeholders.
- The AIS involves a subset of all business data, which makes it one part of a firm's overall information system. It captures accounting data created by business events (or activities) that involve an exchange of economic resources.

The term **business event** refers to a single business activity in a business process. Business events are definable activities that take place during normal business operations. Examples of business events include "Sell goods to customer" and "Purchase equipment." These events give rise to accounting transactions because they involve an exchange of economic resources that impacts the accounting equation. An example of a business event that does not give rise to an accounting transaction is "Take customer order." Even though it is essential for the business to collect data about customer orders in its information system, this event's data does not flow through to the AIS. It is filtered out and stored in other parts of the company's information system (**Illustration 1.4**).

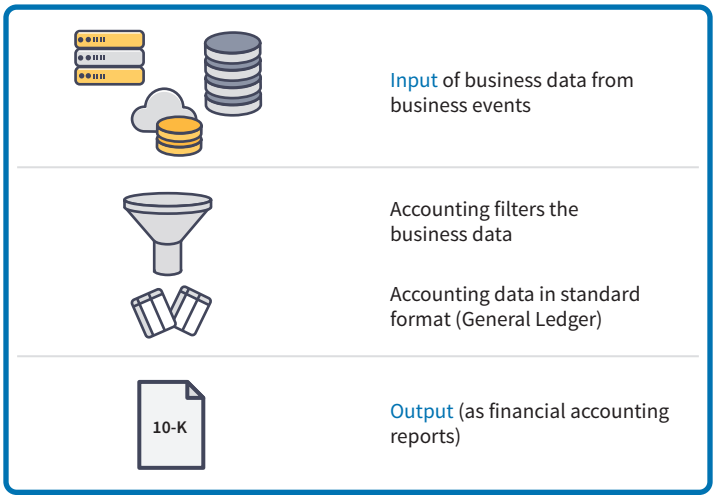
Keep in mind that financial accounting is one subdiscipline of accounting. Other important subdisciplines are auditing and assurance, taxation, managerial accounting, forensic accounting, and sustainability accounting. They are all connected, and they all influence a company's AIS. These connected disciplines extend the boundaries of traditional accounting information outputs from the AIS to provide various reports in many different formats.

AIS complexity and size vary based on a company's needs:

- CPA A less complex AIS is a stand-alone system used by small businesses that focuses on the accounting equation and financial implications of the underlying business events.
- CPA An AIS with higher complexity can fully integrate with the company's enterprise-wide information system.

As companies grow, their information systems grow in complexity. An integrated AIS enables accounting reports that are far broader than simply tracking assets, liabilities, and owner's equity. Thanks to technological advances, data that used to be captured during a business event and later input into multiple systems—often manually —is now captured once when the business event occurs, often in real time. Now, data automatically flows throughout the integrated information system to the functional areas that need it. Benefits include quick access to that data, robust and real-time reporting, and the ability to make decisions faster. For example, a mobile-app-based company generates large amounts of real-time data that are instantly captured in the company's AIS as business events occur. We use a fictional company called Julia's Cookies to apply the concepts of AIS to a modern digital business model.

ILLUSTRATION 1.4 Financial accounting data is a subset of business data.



Meet Julia's Cookies

Julia's Cookies is a national bakery offering fresh-baked cookies for pickup or delivery, with a limited selection of cookies available for walk-in customers. Every cookie is placed in the oven when ordered, so customers are served fresh, delicious cookies all day. The company was founded by a group of college students who wanted to satisfy the late-night cravings of finals week (**Illustration 1.5**).

ILLUSTRATION 1.5 Julia's Cookies' business model includes achieving its mission, vision, and values.

As they discussed opening a late-night bakery together, the group realized that students aren't the only ones who crave late-night treats. Nurses, doctors, firefighters, restaurant workers, and many other professionals also keep late hours and might appreciate having cookies available any time. By targeting late-night hours and the convenience of ordering freshly baked cookies delivered directly to the customer, the group could meet a niche market need that nobody else in town was fulfilling. If they could obtain funding for the startup, their innovative business model's competitive advantage might be successful. The group entered a startup challenge at their university and won seed money to fund the initial business.

Over the next several years, Julia's Cookies expanded its operations through both organic growth and acquisitions. Julia's Cookies now has over 4,000 employees and operates in 44 states (**Illustration 1.6**).

2010 The business idea is born. The idea is pitched at a startup challenge, and the group wins $20,000 as seed money.

2011 Julia's Cookies' website launches! The first store opens within a local startup incubator.

2012 To meet high demand, a brick-and-mortar store opens in Chicago.

2013 Julia's Cookies expands the business with three new locations.

2017 Julia's Cookies launches a new app and opens 10 more locations. The company now has 500 employees.

2019 Julia's Cookies focuses on social responsibility and creates Cookies Cares Charitable Foundation.

2021 Julia's Cookies acquires CookieCrunch It now operates in 40 states with 3,000 employees in total.

2022 Julia's Cookies expands into grocery stores, where it sells frozen cookie dough.

2026 Julia's Cookies prepares for an initial public offering of its shares by ensuring compliance with SEC financial reporting requirements.

ILLUSTRATION 1.6 Julia's Cookies began as a startup idea and is now found in grocery stores throughout the United States.

Throughout your AIS course, you will use Julia's Cookies to learn skills employers look for in accounting graduates:

- Each chapter begins with a job posting for Julia's Cookies that demonstrates technical skills and concepts needed for an accounting position related to that chapter's topics. These job postings are based on real jobs for companies like Home Depot, Uber, and TikTok.
- Each learning objective includes an Applied Learning exercise for Julia's Cookies. You will help Julia's Cookies employees make important business decisions, solve problems, and perform data analytics.

Julia's Cookies uses a smart phone app to connect customers to its local stores, where cookies are freshly baked when ordered and delivered to each customer's location. This app-based business model is how real businesses like Tiff's Treats, Insomnia Cookies, and many other companies in the food service industry stay relevant. In today's world, third-party companies like Uber Eats, DoorDash, and Grubhub can connect customers to a restaurant from their phones while charging fees to both the customer and the restaurant for the service. Offering a proprietary app for direct ordering can save the restaurant money, which increases the restaurant's profitability. You will learn more about profitability and business models next, but first take a moment to explore the Internal Audit department at Julia's Cookies and help the vice president prioritize skills for next year's Internal Audit internship program in Applied Learning 1.1.

Julia's Cookies

Applied Learning 1.1

Accounting Skills: Rotational Internship Candidates

Dylan is the vice president of Internal Audit at Julia's Cookies. He's meeting next week with a campus recruiter, Lauren, from the Human Resources department to discuss what skills his team is looking for as a department participating in the company's Finance Leadership Rotational Program. Lauren's team will attend career fairs at local colleges and meet with student candidates for the program this fall. She needs to understand what skills and personality traits Dylan's team needs so she can screen candidates for interview slots.

Lauren sends Dylan a list of skills the Internal Audit, Accounting, and Finance departments have historically looked for in candidates for this program.

Using what you have learned about misconceptions about accounting professionals versus the reality of accounting, what seven skills from the following list do you think Dylan should prioritize for next year's rotational internship program?

Mathematics

Critical thinking

Organization

Time management

Judgment-based decision making

Attention to details

Team building and collaboration

Process improvement

Data entry

Error identification

Record keeping

Problem solving

Innovation

Presentation and public speaking

SOLUTION

Dylan should focus on relationship building and collaboration skills first. As trusted advisors to their companies, Internal Audit team members need these and other soft skills that enable them to interact effectively and harmoniously with others:

Critical thinking
Judgment-based decision making
Problem solving
Team building and collaboration
Process improvement
Innovation
Presentation and public speaking

Candidates need these skills in addition to fundamental accounting knowledge gained in an accounting program. This is not to say the other skills are unnecessary, but Dylan's team will have an easier time training an intern in areas like data entry and record keeping. Soft skills improve over time and can be difficult for an employer to teach.

Understanding Business Operations

The **purpose of a business** is to make a profit and generate enough cash flow to continue operating. Without the profit motive, it would not be a business (at least not for very long). There are two reasons for the profit motive:

- Stockholders will not invest in a company if they do not expect to earn a competitive return, which is determined by the company's profits. These profits can increase stock value or be paid to stockholders as dividends.
- Profit is reinvested into the company to expand operations and fund activities. Do you remember Retained Earnings? Profits not declared as dividends to be paid back to investors are closed out to Retained Earnings for future reinvestment in the business.

To earn profits, a business engages in business operations. Learning about AIS requires a strong foundation in business operations, so we will review some key business terms used throughout this course.

Business Models

CPA A **business model** is a company's plan for operations. It includes identifying the customer base, products, operation plans, and revenue and financing sources. Companies make strategic plans that consider profitability, investor input, risk, and environmental and social responsibility to create a business model. Social responsibility is part of a business model that helps companies be socially accountable to internal and external stakeholders, its community, and society. The business world has seen a drastic shift in how companies prioritize social responsibility, more recently referred to as ESG, which is an acronym for an Environmental, Social and Governance framework to assess performance on various sustainability and social issues, with a rapidly increasing focus on climate change. In the United States, On March 6, 2024, the SEC issued a final pronouncement requiring registrants to provide climate disclosures in their annual reports and registration statements, including those for initial public offerings (IPOs). The implementation date is pending the outcome of litigation.

ESG initiatives such as sponsoring employees to volunteer on company time, matching employee donations, moving to more sustainable energy systems, and reducing the carbon footprint have become more popular. An example is Julia's Cookies' social responsibility campaign, Cookies Cares (**Illustration 1.7**). Companies use their profits to sponsor these initiatives, so it is important for a company to achieve its primary purpose of profitability to cover these additional ESG costs.

ILLUSTRATION 1.7 Julia's Cookies' social responsibility campaign is called Cookies Cares.

There are many types of business models, including:

- The **franchise business model** allows individuals to purchase and run a franchise of a popular fast-food chain (for example, McDonald's).
- The **subscription business model** involves charging a monthly subscription fee for unlimited access to a service or product (for example, Netflix).
- The **freemium business model** involves offering free services but charging a fee to access upgraded features (for example, Dropbox).
- The **peer-to-peer business model** connects individuals with one another (for example, Airbnb).
- The **direct-to-consumers business model** involves selling directly to customers. For example, Julia's Cookies uses a mobile app to sell cookies directly to customers instead of using a third-party delivery vendor like DoorDash.

While Julia's Cookies' primary business model is direct-to-consumers cookie delivery via mobile app sales, the company recently began selling frozen cookie dough to local grocery stores. This product line uses a traditional **retailer business model**. Large corporations may have multiple business models designed specifically for their different product lines. Successful businesses integrate different types of business models to create customized approaches to their operations.

Business Processes

Business models are achieved through well-designed business processes. CPA A **business process** is a group of related business events designed to accomplish the strategic objectives of the business. Recall that a business event is an activity that takes place during company operations.

At a high level, business processes take inputs of resources to create products and services as outputs. These outputs must have value to customers, or they will not sell. In its simplest form, a **basic business model** consists of three primary types of business processes (**Illustration 1.8**).

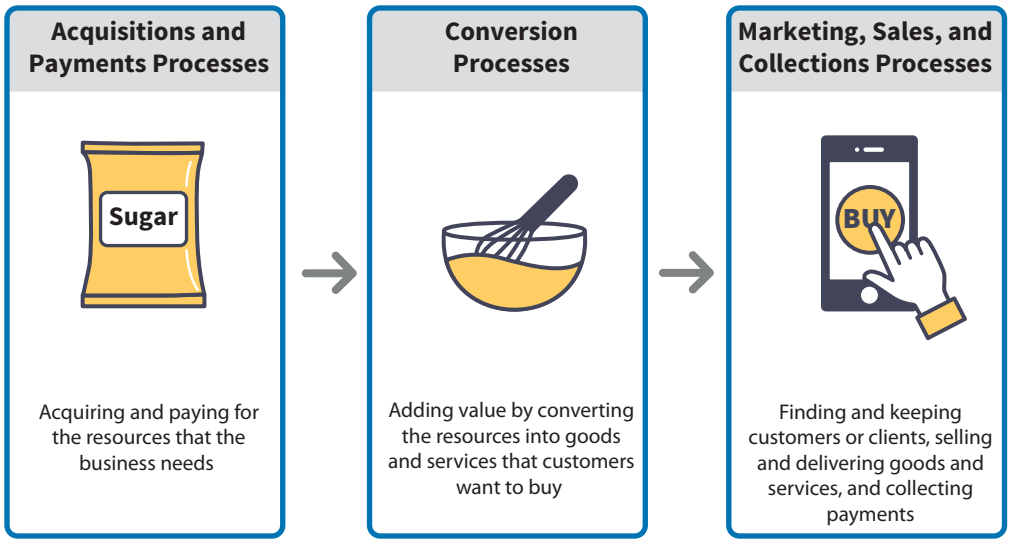


ILLUSTRATION 1.8 A basic business model has three primary types of business processes.

Later in this chapter, you will learn more about these three types of business processes and how they are recorded in the AIS. For now, remember that the three key steps of an information system are collecting data, processing and storing data, and reporting information. **Illustration 1.9** compares each type of business process to each of the three key steps of an information system.

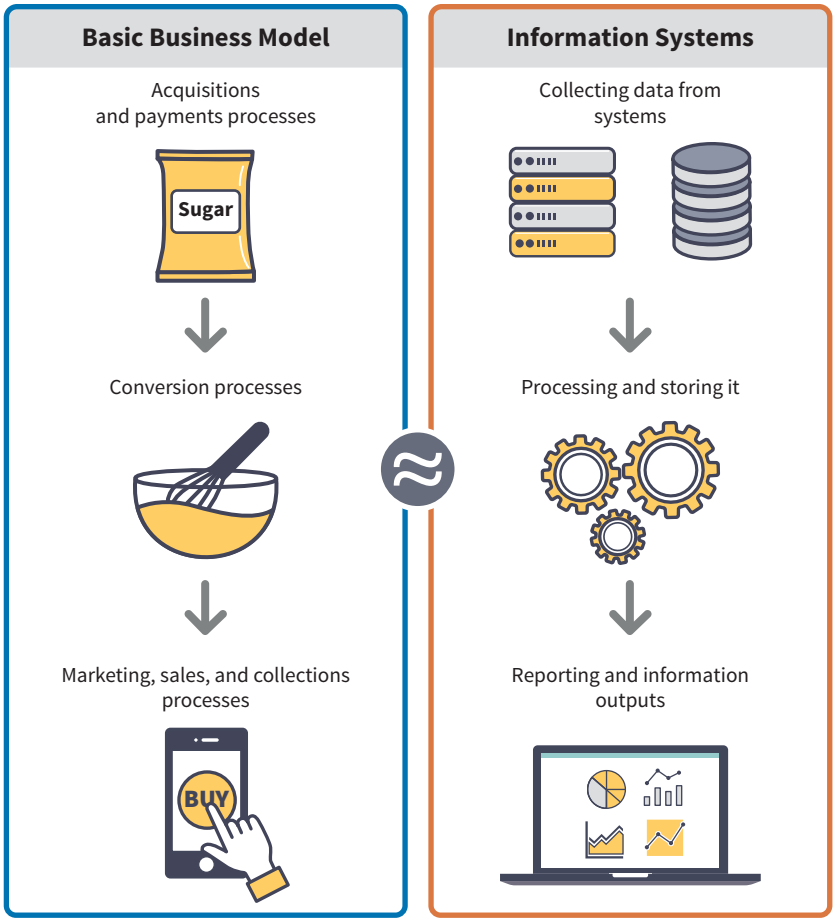


ILLUSTRATION 1.9 The basic business model is comparable to an information system, with inputs, processing, and outputs.

When viewed this way, a business itself is a system. It has inputs (acquisitions), processing and storage (conversion), and outputs (products and services). These components are linked in a continuous value chain between suppliers of resources, business operations,

and customers. A company needs well-designed and interrelated business processes to operationalize its business model.

The business processes generate data, which are input into the AIS. Accounting filters and records that data appropriately and transforms it into usable information. Accounting's role in converting business data into usable information is so essential that accounting was among the few disciplines chosen for the earliest purposes of computers.

Every business process comprises one or more interrelated business events. For example, a simple marketing, sales, and collections business process is "Selling cookies to online customers." This business process consists of multiple interrelated business events, which we discuss next.

Business Events

You have learned that an AIS captures data generated from business events that may result in economic activities, like business transactions. Now, let's look more closely at what a business event, also called a **business activity**, really is.

A business event always includes a verb and a noun that is the object of the verb. For example:

- Sell (verb) goods (noun) to customer.
- Purchase (verb) equipment (noun).

There are four types of business events or activities:

- CPA **Operating events**: Normal business operations, directly relating to the company's creation and provision of a good or service to its customers. Examples include:
  - Collect customer payment
  - Hire employee
  - Pay employee
  - Deliver goods to customer
  - Measure factory waste production levels
- CPA **Investing events**: Acquiring long-lived assets that will deliver value in the future. Examples include:
  - Buy/sell property, plant, and equipment
  - Buy/sell marketable securities
  - Buy/sell other businesses
  - Invest in a real estate fund that achieves both social and economic returns
- CPA **Financing events**: Helping the company acquire incoming cash flows to fund operating events. Examples include:
  - Issue stock
  - Issue green bonds to fund renewable energy production
  - Declare dividends
  - Borrow money from the bank
  - Pay loan installment to the bank

CPA These three types of business events are familiar to accounting students. They are the types of activities disclosed on the cash flow statement: operating activities, financing activities, and investing activities. Other events are different in that they do not result in an exchange of economic resources:

- **Information events**: An exchange or creation of information and not an exchange of economic resources. Examples include:
  - Take customer order
  - Create purchase order
  - Interview candidate for employment
  - Print financial statements
  - Present ESG metrics to the board of directors

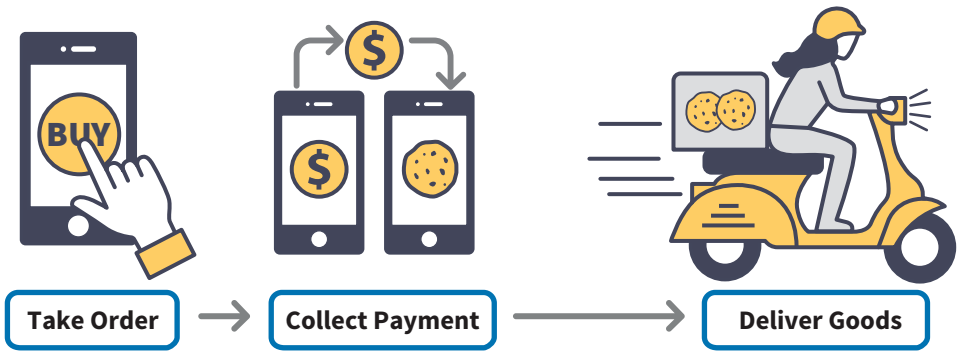


ILLUSTRATION 1.10 Julia's Cookies' business process for online ordering has three major business events.

These different types of business events combine to create a business process. Remember Julia's Cookies business process, which is "Sell cookies to online customers"? Three interrelated business events create this business process (**Illustration 1.10**):

- **Take customer order:** Customers order cookies on the mobile app.
- **Collect customer payment:** Customers pay via the mobile app.
- **Deliver goods to customer:** Local delivery drivers deliver directly to the customer's location.

In this example, how many of the three business events result in the exchange of economic resources? The answer is only two: "Collect customer payment" and "Deliver goods to customer." These two events generate accounting transactions captured in the AIS.

Does this mean "Take customer order" is unimportant? Of course not. Without taking a customer's order, there would be no sale, revenue, or cash receipt. Information events are crucial business events that often combine with the other three types of events to create business processes.

The company's information system captures the data *of interest* about these business events. The information system does not have to capture all the data about a specific business event—only the data the company needs. For a customer paying cash at a grocery store, there may be no need to capture the data for customer name and address. For credit sales, that data is essential. The information system transforms the captured data into usable information. You will learn how management uses this information later in the chapter.

Why Does It Matter to Your Career?

Thoughts from an Internal Audit Intern, Manufacturing

- There is a high demand for accounting professionals who embrace technological agility in their role as information professionals. Changing the widely held public misperception of accounting and accounting information systems is a slow process, so companies want to hire individuals who already embrace this reality.
- Once you join a team, you may find that some team members resist change. As a member of the newest generation of accounting professionals, you will be in a position to influence your teams. An important skill is driving change while respecting the opinions of others.
- Familiarity with business processes and how the information system captures data about those processes gives accounting professionals a holistic view of the business—a valuable perspective that will help you provide meaningful solutions and ideas for your team.

1.2 How Have Accounting Information Systems Evolved?

Learning Objective 2

Compare and contrast traditional transaction-based accounting systems with process-based information systems.

Before the advent of the sophisticated, integrated, **process-based information systems** we use today, firms used **transaction-based AIS** to record only accounting transactions. These systems were limited in that they ignored nonfinancial data and the relationships between business events and business processes. They still exist today, especially in small businesses, and you may encounter them in your career.

Regardless of the type of information system used, accounting professionals must understand financial accounting transactions, which are the business events resulting in the economic exchanges of resources. Recall that business events combine to create a business process, but not all business events result in economic exchanges of resources. Many business processes include informational events, which (as you have learned) involve the exchange or creation of information.

Let's summarize what you have learned so far:

- Interrelated business events form business processes.
- Business events create data.
- Data of interest are stored and processed by an information system.
- The system generates information for decision-making purposes.

The basic business model, composed of three main types of business processes, reappears in more detail in **Illustration 1.11**.

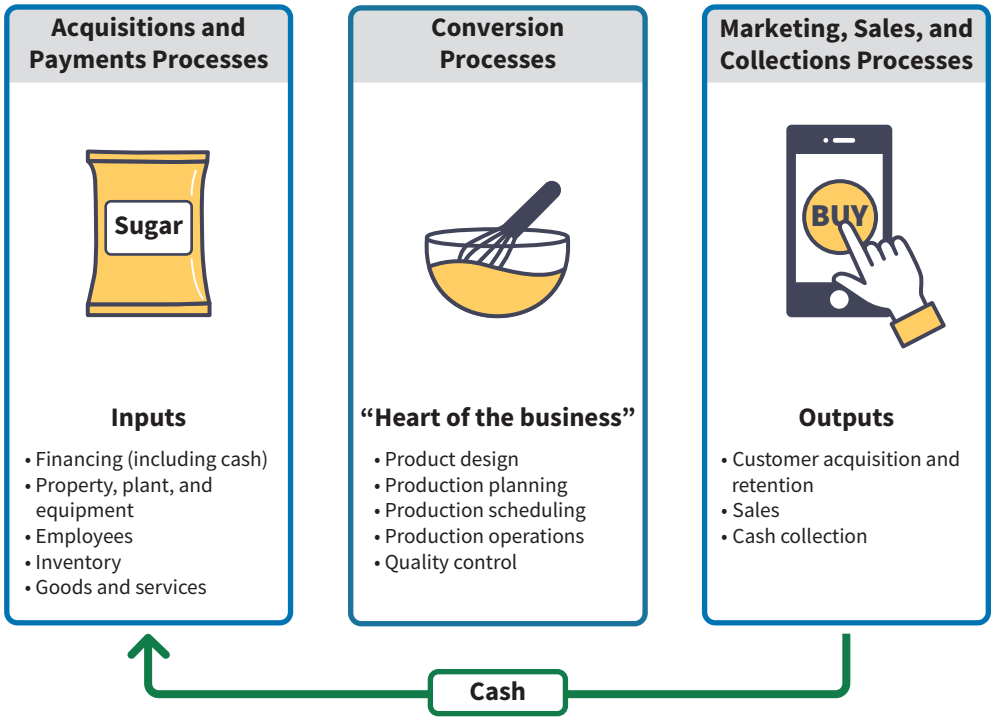


ILLUSTRATION 1.11 The basic business model includes all of the acquisitions and payments, conversion, and marketing, sales, and collections processes that make up a company's operations.

While operating, investing, and financing events occur in a business, there are also information events, such as a marketing employee retrieving customer lists or the company accountant printing out a set of financial statements at month end. These reports might be presentations, spreadsheets, or charts and graphs. They provide the basis for management and other users' decision-making activities or events. Simply put, an information event can involve producing reports.

Let's look at an acquisitions and payments process that includes three business events:

- Order sustainable raw materials from vendor
- Receive raw materials from vendor
- Pay vendor

What data should the business collect for "Order sustainable raw materials from vendor"? The data could include date of order, vendor name, product ID, sustainability score, order quantity, price, and promised delivery date.

Recall that a transaction-based AIS captures only accounting business events, while a process-based information system captures all the data of interest generated in a business process, including informational events. Let's compare the transaction-based AIS to the process-based information system for the three types of business processes:

- Acquisitions and payments processes
- Conversion processes
- Marketing, sales, and collections processes

Acquisitions and Payments Processes

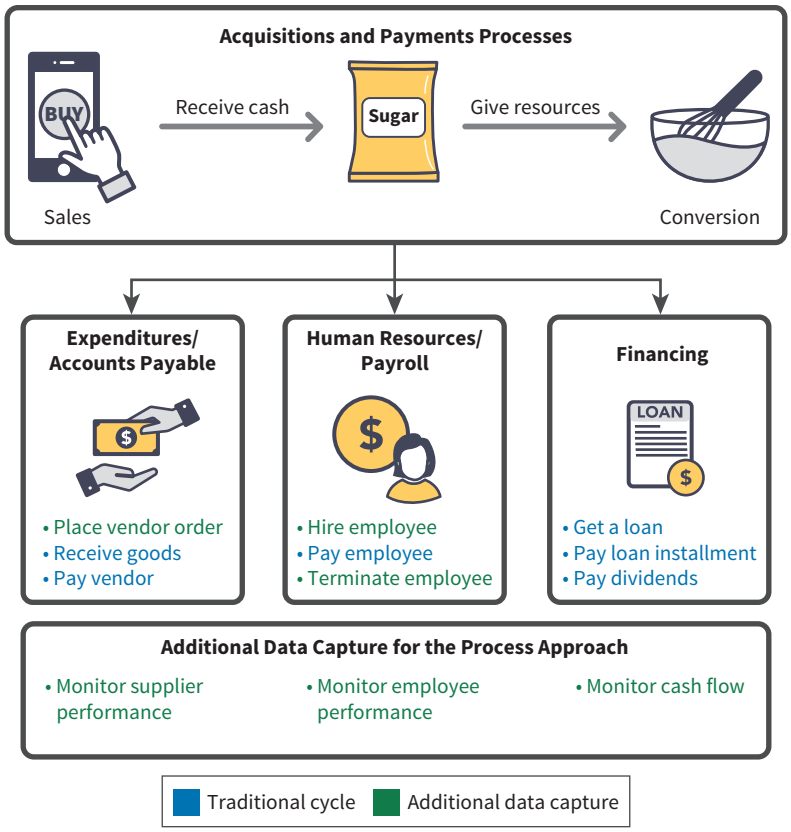
CPA Management's first task before the business can actually *do* business is to buy and pay for the resources the company needs. These processes become an ongoing commitment throughout the life of the business. The types of resources vary across companies and industries. Common resources include:

- Financing (a central part of the Treasury function)
- Property, plant, and equipment (also called fixed assets)
- Employees (yes, employees are a resource and hiring is part of the Human Resources function)
- Raw materials and inventory (purchasing is part of the acquisitions process)
- Other goods and services

Acquiring the resources that a business needs is an *input* to the business. A manufacturing company must hire employees to work on the manufacturing line and purchase the equipment needed to manufacture its products. It must also purchase raw materials to transform into its final product. These are all inputs to the company's operations. However, hiring employees is not an exchange of economic resources. In fact, hiring and paying employees are two separate business events—and only paying them is a traditional accounting transaction involving an exchange of economic resources. With a transaction-based AIS, hiring employees would not be captured as part of AIS data.

Illustration 1.12 compares the traditional accounting transactions to the business processes captured in a process-based information system. The blue terms indicate examples of data capture in traditional accounting cycles. A business-process approach includes this data but also captures the other data about the business events, shown in green. This process-based approach is more inclusive, capturing both financial and nonfinancial data, and nonfinancial information can be just as useful for decision making as financial information.

ILLUSTRATION 1.12 A process-based system for acquisitions and payments processes captures additional useful information.



For example, employee terminations may not result in accounting transactions other than for the final liability or payment for salary and benefits. However, accounting professionals can use this data to calculate monthly employee turnover—the percentage of employees leaving the company each month—to analyze the risks in each of the company's plants. High turnover can create opportunities for fraud, reduce a plant's productivity, and result in high costs related to hiring and training new employees, which can cost thousands of dollars and take weeks—all factors of interest to accounting professionals.

Help Jesse decide which business events are captured in a transaction-based AIS in Applied Learning 1.2.

Julia's Cookies

Applied Learning 1.2

Acquisitions and Payments Processes: Ordering Flour

Jesse orders ingredients for all the Julia's Cookies shops in the greater Chicagoland area.

As part of the acquisitions and payments processes, Jesse orders flour and creates the following three associated business events. Which of these are operating events that would be captured by a transaction-based AIS?

1. *Order raw materials from vendor*

   On Monday morning, Jesse sends an order for organic flour to Flowers & Flours, a local artisanal flour company. Jesse frequently partners with local suppliers to support Chicago area businesses and to provide high-quality, locally sourced ingredients to Julia's Cookies' customers.

2. *Receive raw materials from vendor*

   Wednesday afternoon, Flowers & Flours' delivery driver arrives at Jesse's warehouse and delivers the flour. John, who works in the warehouse, accepts the delivery and counts the bags of flour he received. He inputs the receiving data into the information system for matching to the purchase order prior to payment. This is done to ensure that only items ordered are accepted and Julia's Cookies only pays for items that are ordered and received.

3. *Pay vendor*

Flowers & Flours electronically sends an invoice for Jesse's order at the time the flour is delivered and John accepts it. On the payment due date, Patty, who works in the Accounts Payable department, checks that the purchase order, the goods received, and the invoice from the vendor all match. She then approves the payment to Flowers & Flours. The system processes a payment for electronic transmission to Flowers & Flours.

SOLUTION

While all three of these are operating events, ordering raw materials would not be captured in a transaction-based AIS. Receiving raw materials increases physical inventory counts and liabilities, so it is an accounting transaction. Paying the vendor is also a traditional accounting transaction that decreases cash and accounts payable.

Conversion Processes

CPA After purchasing the resources needed to operate, a business creates value, or profit, by combining and converting resources to goods and services customers want. These are the conversion processes, which are at the heart of the business. Converting raw materials into a product or providing services to a client is the *processing* part of the business as a system.

The more innovative and efficient the process (and social responsibility or ESG can be a part of it), the more potential there is to gain a competitive advantage. If two firms make the same product or perform a service in the same way, they will have difficulty differentiating themselves in the market. Remember how products and services are an essential part of a business model? A unique product or service with no competition could command a higher price from customers.

Illustration 1.13 compares data captured in a transaction-based AIS to the more robust data captured in a process-based information system:

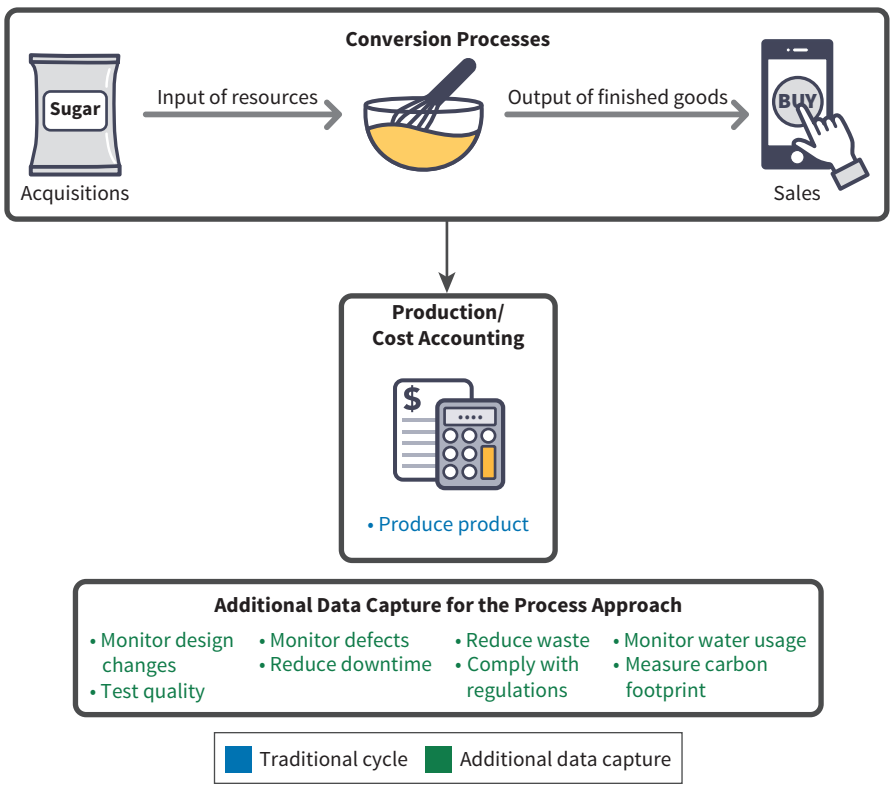


ILLUSTRATION 1.13 Conversion processes also generate additional useful information not captured in a traditional transaction-based system.

In addition to those in the illustration, nonfinancial business events include the following:

- Design product
- Test product
- Plan production
- Schedule production
- Assemble product
- Package product

As discussed earlier, social responsibility has become important to companies. The conversion processes can also capture ESG data, which measure a company's environmental footprint and societal and economic impacts. For example, an organization may collect data on:

- Supply chain miles
- Water usage
- Carbon footprint
- Product recycling rate
- Energy consumption
- Waste reduction rate

In the Real World McDonald's Regrets Changing Its Conversion Process[2]

McDonald's started out as a hot dog stand in California in the late 1930s. Today, McDonald's is one of the most widely recognized name brands in the world. It climbed to international success because of its strategy of efficient and reliable food delivery, with a streamlined conversion process (converting raw materials into fast food) to provide a product that is fast, cheap, and consistent in quality. However, the road has not always been smooth for this highly successful company. Management has made costly mistakes along the way. One of the most notable mistakes occurred when the leadership team shifted focus with a change in business strategy, which it implemented by changing the production process.

The Change	Management changed the production process to introduce a concept called "Made for You." Orders were prepared to suit individual customer preferences, which required expensive equipment upgrades in addition to the process change. These changes resulted in enhanced food quality, but it took more time to make those upscale burgers.
The Outcome	Management failed to balance innovation and a shift to a different product with production process efficiency. The old, efficiently produced products were familiar to customers. People knew what to expect when they came to McDonald's—food that was fast, cheap, and always tasted the same. They did not want a nicer-tasting burger that was more expensive and took more time to prepare. Customers were suddenly waiting much longer for their food, and the new options were more expensive. This was not what McDonald's customers wanted. "Made for You" eventually failed—an expensive mistake with advertising costing over $200 million. As a result, the company lost value on the stock market when its stock price declined because of this fiasco.
The Lesson	Don't make changes to business strategy and production processes to support the strategy if the changes do not align with customer wants and needs. CFOs and other accounting professionals who are part of a management team can learn a lesson from the mistake that McDonald's made.

What could McDonald's have done differently before implementing the changes described here to ensure that the changes aligned with customer wants and needs? Do you think this situation put the success of McDonald's at any kind of risk?

Marketing, Sales, and Collections Processes

CPA After converting resources into products and services, a business needs to generate revenue by marketing and selling them, and collecting the cash from the sales. The cash flows back to resources and replenishes the cash balance so the firm can pay its commitments.

Selling and collecting cash from sales are the *outputs* of the business. **Illustration 1.14** compares data captured by a traditional transaction-based AIS to data captured by a modern process-based information system.

Remember, if a company loses its customers, it loses its sources of revenue. With profitability as the primary goal of a business, capturing data related to customers and sales—beyond accounting transactions—is essential to monitor operations and identify areas for improvement.

[2]www.business2community.com/business-innovation/3-companies-failed-adapt-went-wrong-01895678

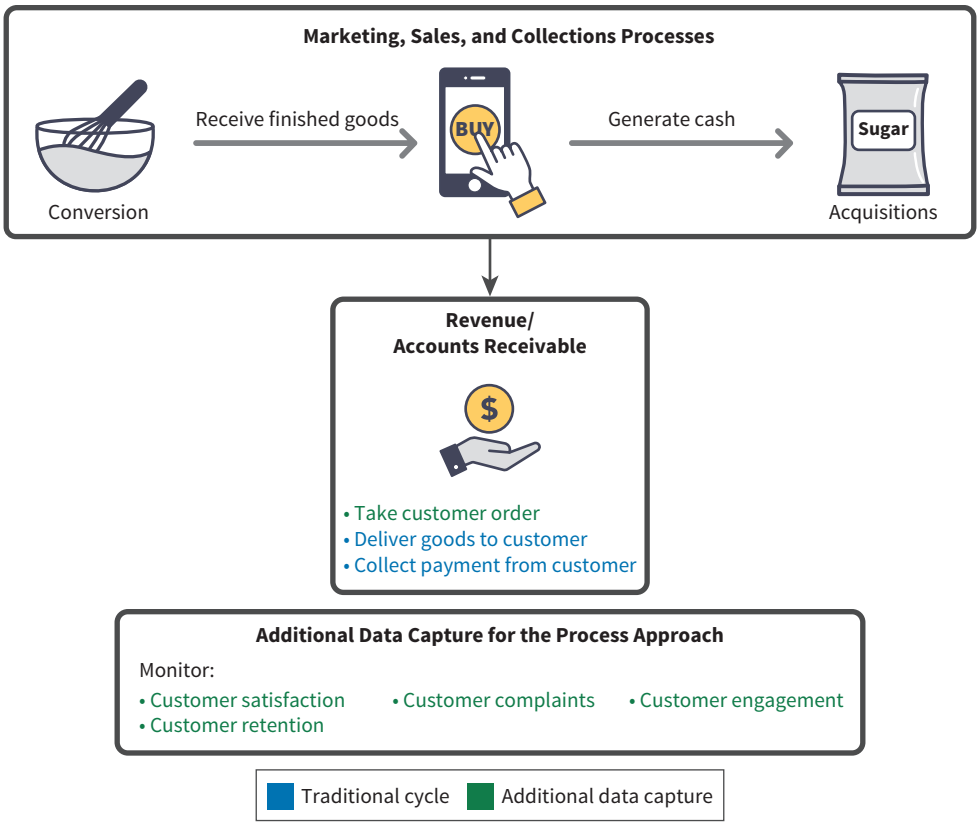


ILLUSTRATION 1.14 Turning finished goods into cash generates useful information not captured by traditional transaction-based systems.

What additional data do you think a company may want to capture about customers in a process-based information system? It is critically important to focus on customer satisfaction, and other nonfinancial information that could be invaluable includes:

- Conversion rate from first contact with potential customers to their becoming customers
- Online search engine rankings
- Online click-through rate
- Online engagement level
- Social media posts

You will learn more about business processes as you continue your AIS course. Subsequent chapters explore the risks, controls, and reporting related to business processes. Now that you have been introduced to companies, their information systems, and their key business processes, you will apply these foundational principles in the following chapters to identify and manage risks related to companies' information systems and business processes.

Why Does It Matter to Your Career?

Thoughts from an Accounting Data Analytics Intern, Public Accounting

- Data from older, nonintegrated systems may not be current or accurate. It may be inconsistent with the data in other separate systems in the same company, even though the data is supposed to be identical. These older systems and systems integration issues present significant concerns when leveraging data.
- Accounting decision making and problem solving require an understanding of business processes. Your ability to solve problems improves through understanding different levels of sophistication in systems.
- Maintaining a competitive advantage for your clients or your company requires capturing better data. You can help by recommending how your clients or company can capture robust data from its business processes. Data analytics can transform this data into useful insights—something businesses are doing with increasing sophistication.

1.3 How Does Management Use Information?

Learning Objective 3

Explain management's relationship to information and information systems.

"Management," "end users," "users," "stakeholders," and "decision makers" are interchangeable terms for people who use the information created by an information system.

A significant part of the management function in any company is using information to make decisions about business processes. These business processes must produce outcomes that align with the company's strategic plan. Business processes and related information systems change because of management decisions. Management oversees business processes through planning, implementing, monitoring, and changing and improving processes.

Management's Responsibility for Business Processes

An AIS provides financial and other metrics determining how well management implements and controls business processes. Management's responsibilities for overseeing business processes include:

- *Planning*
  - Developing a strategic plan to create a sustainable competitive advantage
  - Designing business processes focused on achieving strategic goals
  - Identifying key performance indicators and benchmarks
  - Identifying opportunities and assessing their risks
  - Forecasting future performance
- *Implementing*
  - Implementing or putting into place a strategic plan
  - Dividing high-level business objectives into smaller processes and events
  - Assigning employees to perform activities
  - Motivating employees to maximize their performance
  - Embedding internal controls in processes and systems to prevent and detect errors and fraud
- *Monitoring*
  - Evaluating the operating results and financial position
  - Assessing whether strategic objectives are being attained by:
    - Analyzing financial statements (which you learn about in financial accounting classes)
    - Using data to monitor risks in real time (which you learn about in this course)
    - Monitoring key performance indicators and comparing them to benchmarks (which you learn about in management accounting classes)
    - Auditing processes, systems, controls, and transactions (which you learn about in external and internal auditing classes)
    - Comparing actual performance and metrics to forecasts and budgets (which you learn about in management accounting classes)

- *Changing and improving processes*
  - Changing designs of business processes or events so that actual results meet expectations
  - Improving the design and correcting identified issues
  - Prosecuting occupational fraudsters to the full extent of the law and sending a message of zero tolerance for fraud to management and other employees
  - Improving internal controls to decrease opportunities for errors and fraud

One of the many responsibilities of management is identifying ways to assess and monitor the performance of the company and its business processes. A popular method is to implement **key performance indicators (KPIs)**, which are quantifiable metrics used to measure and evaluate the success of a company against its objectives. Benchmarks—points of reference for a company's industry—are often readily available for comparison to a company's own KPIs. Julia's Cookies can use benchmarks for the bakery or food service industry to compare its performance against its competitors. Many KPIs are accounting ratios you learn about in accounting classes, like net profit margin, return on assets, or earnings before interest, taxes, depreciation, and amortization (EBITDA).

The relationship between business processes, the information system, and management is iterative (**Illustration 1.15**) because the responsibilities of management (planning, implementing, monitoring, and changing and improving) relate to the business processes. Management decisions affect business processes, which affect the data the information system captures and the information management receives, which again affects decision making that may result in changes to business processes.

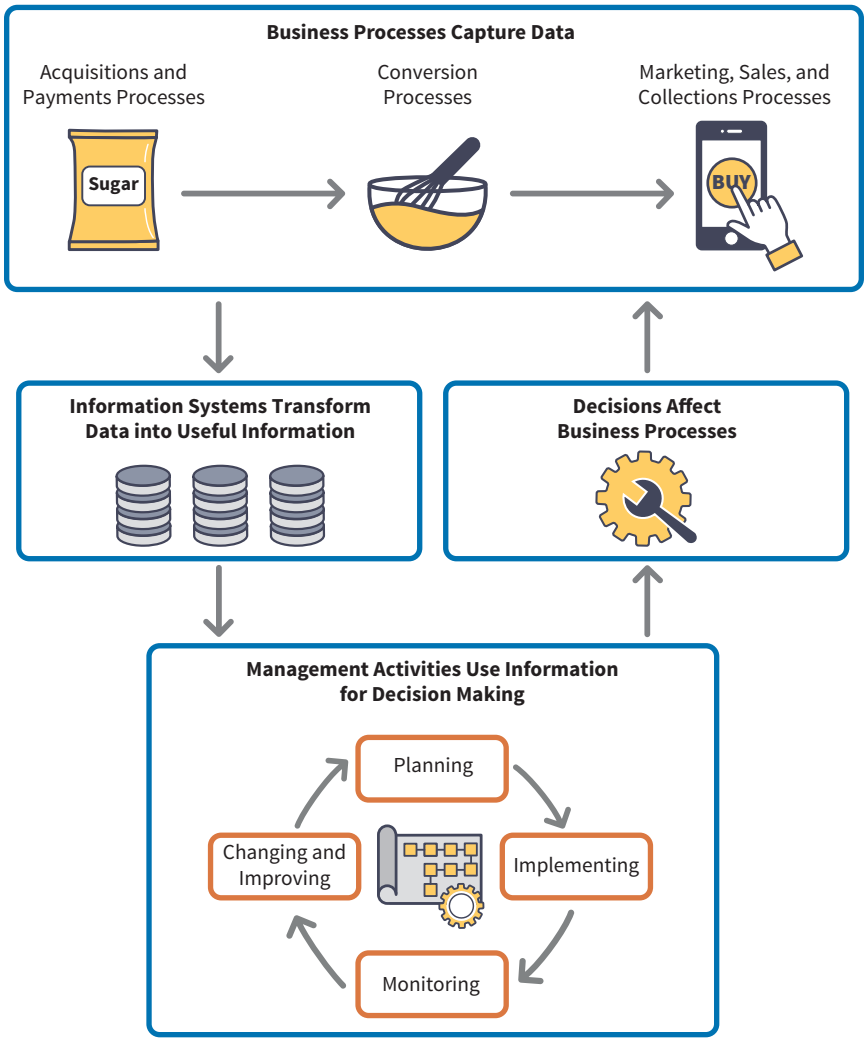


ILLUSTRATION 1.15 There is an iterative relationship between management, information system, and business processes.

Data-Driven Decision Making

Decision-making data, including the data to perform calculations for KPIs, comes from the business's information systems—often the accounting information system. Management combines the principles of *quality of information* and *decision context* to identify the information needed from an AIS for decision-making activities.

Quality of Information

At Julia's Cookies, the following steps create the iterative relationship between management and the AIS:

1. *Business events create data.*

   Business operating event: Employees at the local factory purchase raw ingredients to make cookies from local vendors. This event creates data —the cost of the ingredient (cost), the vendor it is purchased from (vendor), the location where the purchase was made (region), and the date of the purchase (year).

   Business operating event: A customer buying cookies creates data—the location where the sale took place (region), the amount of the sale (revenue), and the date of the sale (year).

2. *The AIS transforms raw data into useful information.*

   The AIS stores the purchasing and sales data, which is used to create a report that includes the KPI gross profit margin. Gross profit margin is calculated as (Revenue − Cost of goods sold)/Revenue. The purchasing and sales data (inputs) create this KPI (output).

3. *Management uses the information to evaluate the company's success and make decisions.*

   Management uses this report to evaluate the successful operations of stores in different regions. The report shows that the Northeast region of the United States has a steadily high gross profit margin, while the Rocky Mountains region has had a significantly lower gross profit margin for the past three years. Management looks into the vendors used in the Rocky Mountains region and finds that these vendors are charging some of the highest prices in the area. New vendors have opened in recent years and offer better prices, but the Purchasing department has not considered changing vendors. Management creates new policies for the Purchasing department to conduct an annual review of prices to ensure orders are placed with the most competitive vendors.

These two operating events created data, which the AIS transformed into useful information for making decisions. The decisions in this case affect business processes by introducing a new policy to review vendors for better prices, which will lower the cost of goods sold.

Not all information is equal. CPA **Information quality** refers to the suitability of information for a particular purpose in a specific task. Gross profit margin, a ratio accounting students know well, is a great KPI for reviewing the costs of raw materials and sales prices of cookies. In contrast, the debt-to-equity ratio, a KPI used for reviewing financing structure, would not be helpful when making purchasing cost and vendor decisions.

Consider what would happen if the cost of flour were entered into the AIS incorrectly and the gross profit margin at Julia's Cookies were miscalculated. Management would invest time and money into pointlessly reviewing the Rocky Mountains region's operations. What if information system did not capture the locations of the cookies' sales? Management could not review operations by region to explore operations at different stores. Errors in data can have significant impacts on companies. CPA This makes **data integrity**—the completeness, accuracy, reliability, and consistency of data throughout its life cycle in the information system—a high priority.

The Financial Accounting Standards Board (FASB) is responsible for accounting and financial reporting standards throughout the United States. While data integrity is a technical term that applies to all data, the FASB has its version of data integrity, known as the "characteristics of quality financial information," which you may already be familiar with from your financial accounting course(s).

According to FASB, information must have two **fundamental characteristics** (**Table 1.1**).

TABLE 1.1 CPA **Fundamental Characteristics of Useful Information**

Relevance	Information must be capable of influencing a decision. Relevant information has: • Predictive value: Applicable to future events, enabling users to make informed predictions—for example, audited financial statements help analysts predict future earnings per share. • Materiality: Information is material, and if included or corrected, it will likely impact users' judgment when making decisions—for example, expensing small assets instead of capitalizing them is immaterial if it does not impact decision making. • Confirmatory value: Enabling users to either confirm or change prior predictions—for example, the most recent quarterly earnings report helps analysts confirm or change their prior earnings per share predictions.
Faithful representation	Faithfully represented information is: • Complete: Includes all necessary information for faithful representation; all accounting transactions are included in financial statements—for example, inventory on consignment with third parties must be included in inventory on the balance sheet as ownership has not passed. • Neutral: Not favoring a particular outcome and free of bias—for example, choosing an accounting policy that reflects economic reality rather than one that inflates earnings to increase bonuses. • Error free: Accurate, without material mistakes—for example, correct calculations for depreciation and allowance for doubtful accounts.

The usefulness of information increases in the presence of four **enhancing characteristics** (**Table 1.2**):

TABLE 1.2 CPA **Enhancing Characteristics of Useful Information**

Verifiability	Information results in the same conclusions from different independent and knowledgeable individuals—for example, an external auditor is given the cost of fixed assets, salvage value, useful life, and depreciation method to audit depreciation expenses, and gets the same result.
Timeliness	Information is recent and available in time to influence relevant decision making—for example, issuing financial statements to a bank a year after the end of the fiscal year makes it difficult for the bank to determine whether the company can repay its loan obligations.
Understandability	Information is easy to understand within the context of the decision the users must make—for example, a company's financial statements are easy for investors without a major in accounting to understand.
Comparability	Information presents similar items in the same way, making it easy to identify similarities and differences across different companies and time periods—for example, the financial statements of foreign companies using international financial reporting standards are not comparable with U.S. companies using generally accepted accounting principles unless a reconciliation is done.

The FASB's Statement of Financial Accounting Concepts No. 8 discusses these characteristics. **Illustration 1.16** shows the FASB's fundamental and enhancing characteristics.

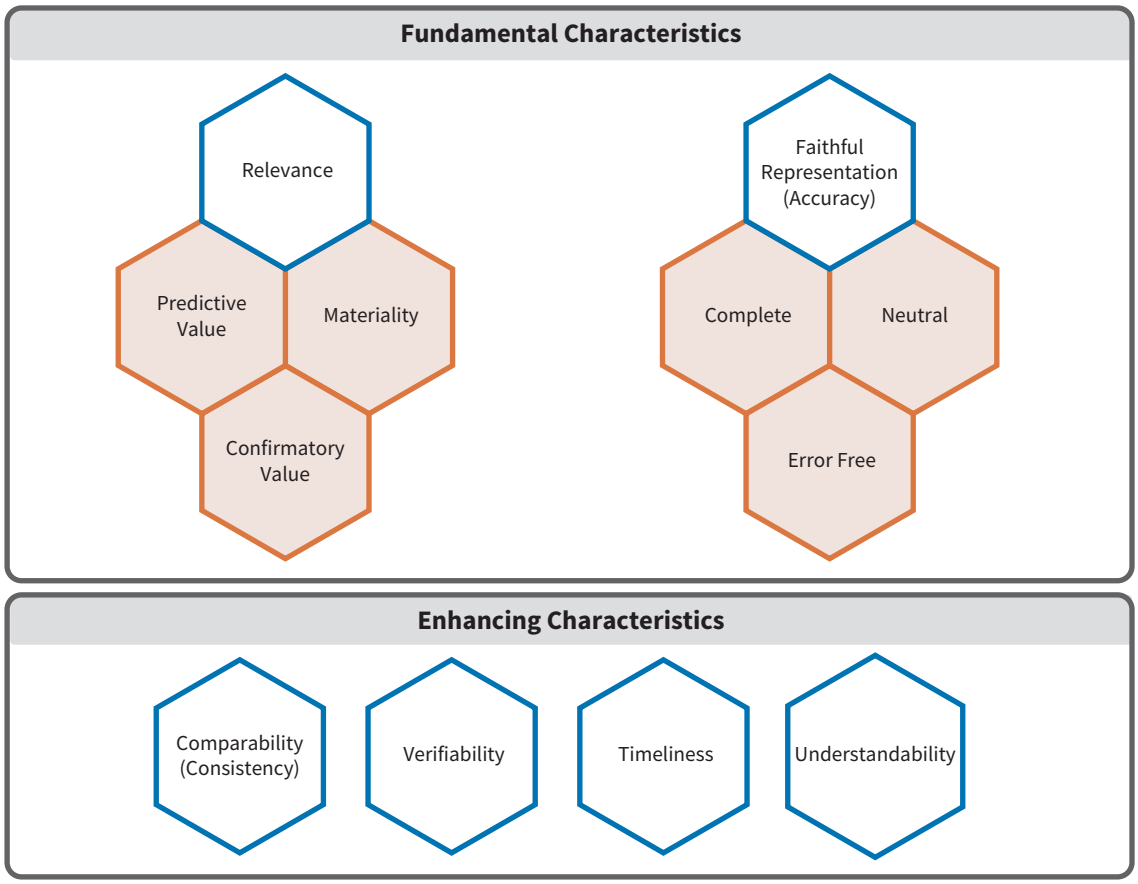


ILLUSTRATION 1.16 The two fundamental characteristics—relevance and faithful representation—work with the enhancing characteristics to create useful information.

CPA Regardless of how many of these characteristics are present, an overall constraint on the usefulness of information is its cost-effectiveness. If the benefit of using useful information exceeds the costs of providing it, then the decision to provide the information is cost-effective. A cost-benefit analysis is necessary to ensure that information is worth the resources needed to provide it. The cost of using information can be simple, as at Julia's Cookies, where the AIS can easily generate a report on the gross profit margin. It can also be complex, as in a company where data are stored in different information systems, files, and formats throughout the business; with this type of complexity, an analyst may spend significant time compiling the sales and purchasing data needed to create a simple KPI.

Why Does It Matter to Your Career?

Thoughts from an Internal Audit Data Analytics Manager, Financial Services

- As an accounting professional, to work with data, you need to understand where the data originates and where it is stored.
- As a new accounting graduate, you can leverage your business processes and information systems knowledge in the job market. Employers value people who ask questions about how the job they are applying for fits into the company's overall business processes and information systems. "Big picture" thinking is an essential skill for accounting professionals, and thinking about the big picture in terms of technology is even better.

Decision Context

Ideally, quality information includes all of the fundamental and enhancing characteristics; however, the cost-benefit constraint often means there are trade-offs in the real world. For example, it may be difficult to get data that is both understandable and timely. If an analyst has to spend significant time working on sales and purchasing data, it may be challenging to obtain the gross sales margin in a timely manner. The choice may be between meeting a deadline and producing highly accurate information. Such decisions are made using the decision context.

The **decision context** is the preferences, constraints, and other factors that affect a decision. In other words, the decision context helps you understand the intended use of information: Who are the users, and why do they need the information?

For a perspective on context, consider Uber, a business that connects people with transportation. Uber needs context—an understanding of drivers, vehicles and their whereabouts, and the customer's preferences—to match up a driver with a customer.

When choosing whether accuracy or timeliness is more important, management considers what the information is being used for. Timeliness may be more critical if the information is part of a weekly status meeting for a sales team. In contrast, accuracy is paramount if the information is part of the annual financial reports.

Management combines the principles of quality information and decision context to identify the required information from the AIS for decision-making activities. You will learn how data is stored in a database for the AIS later in this course, but for now, you need to know how to select the correct data to make a simple business decision. Test your ability to help Julia's Cookies connect a business decision to its supporting data in Applied Learning 1.3.

Julia's Cookies

Applied Learning 1.3

Useful Information: Selecting Relevant Data Points

Rodriguez works in the purchasing department of Julia's Cookies in the Baltimore area. One of the local stores received a sizeable corporate catering order for next week. Rodriguez needs to check inventory to determine if the regional factory can prepare the large order or if he needs to order additional inventory.

Which of these data sources does Rodriguez need to make his decision?

- On-hand raw ingredients (flour, butter, sugar, etc.)
- Equipment (bowls, mixers, baking pans, etc.)
- On-hand packaging (cookie boxes, paper liners, etc.)
- Catering orders (cookie types, quantities, etc.)
- Pricing (costs of flour, butter, sugar, etc.)
- Store information (store name, phone number, general manager, etc.)
- Recipes (ingredient types, ingredient quantities, etc.)

SOLUTION

While there is useful information in all these categories, Rodriguez's business decision concerns inventory. To decide if he has enough inventory on hand, Rodriguez needs to answer the following questions with data from the sources listed:

How many cookies are being ordered, and what types are they? Data source: catering orders

What ingredients are needed for these cookies? Data source: recipes

What ingredients are available to make these cookies? Data source: on-hand raw ingredients

What packaging is available to send these cookies? Data source: on-hand packaging

Although the factory needs equipment to bake the cookies, equipment is not purchased regularly. The factory is already fully operational with the proper equipment.

1.4 What Is the Relationship Between Accounting and Data Analytics?

Learning Objective 4

Describe the relationship between accounting and data analytics.

Accounting is an information-centric profession, and accounting professionals have been performing financial analysis since before computers existed. How companies perform financial analysis, and the types of analysis they prioritize have evolved with the digitalization of business. Business events capture data digitally even in small companies, enabling financial analysis using technology.

This section introduces the role of reporting and data analytics in the accounting profession. In the Data Storage and Analysis chapter, we explore data analytics in depth, including real-world applications of analytics in the various accounting specialties: tax, audit, managerial accounting, and financial accounting. Additional chapters teach hands-on data management and analytics skills, including the various data analytics categories. For now, we focus on the role of data analytics in accounting.

Why Does It Matter to Your Career?

Thoughts from an External Audit Manager, Public Accounting

- One of the most important skills employers want in an accounting new hire is the ability to identify use cases for data analytics. Turning business questions into data analytics scenarios and identifying the data needed to answer the questions are essential skills.
- Even if you are not specializing as a data analyst, you will likely work alongside them. Understanding and speaking their language will make you a valuable addition to any team you join.

Reporting Versus Analytics

You have learned that management makes decisions with the help of useful information, but how do those users get that information? By using data that is generated during business events, companies use two processes, reporting and data analytics:

- CPA **Reporting** is the process of aggregating data into information on the activities and performance in a company.
- CPA **Data analytics** is the process of using technology to transform raw data, or facts, into useful information.

Reporting provides a strictly descriptive view of what happened and does not seek insights into the context or reasons. Many information systems have integrated reporting capabilities. Such reports are usually static but can offer customization for users to choose filters, aggregation levels, and more. An AIS can generate reports on KPIs such as gross profit margin.

In contrast, data analytics answers strategic questions beyond historical reporting by transforming data into insights. Sounds a lot like the definition of an information system, right? The difference is nuanced: an information system captures and processes data, and data analytics uses the data from the information system. Data analytics is performed by a trained

professional who creates custom test parameters, which specify precisely what the analytic will produce—usually through software outside the information system.

Data analytics goes beyond tracking historical figures that reporting provides. CPA In fact, data analytics can use either raw data from an information system or reports generated by the information system.

Management uses historical performance information tracked in reporting with data analytics insights to understand what's happened and make decisions on how to improve business processes. Reporting and data analytics depend on one another, and both are useless without a robust information system capturing the business process data (**Illustration 1.17**).

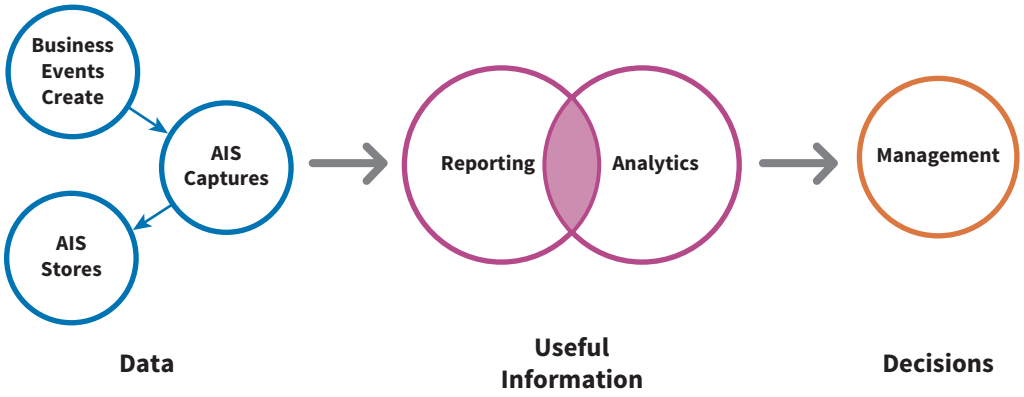


ILLUSTRATION 1.17 The relationship between data, useful information, and decisions is supported by both reporting and analytics.

Data Analytics in Accounting

Accounting is information-focused, so it is not surprising that the accounting profession has transitioned from viewing data analytics as cutting-edge to considering it a mandatory process in many industries. Businesses that do not use data analytics to understand their accounting data are behind their peers.

Accounting data analytics does not have to be complex, but it can be. Think about comparing KPIs that are accounting ratios. CPA Accounting professionals use accounting ratios to compare a company's performance across time, compare one company to another, or compare a company to industry standards. Financial analysis, like analyzing KPIs, has been part of accounting for a long time, but doing such analysis with technology is considered data analytics. Similarly, horizontal and vertical analysis of financial statements used to be a manual pen-and-paper process, but now it is done using data from an AIS and is considered data analytics. You probably learned about these types of analysis in your introduction to financial accounting courses.

For processes accountants have been doing manually for decades, we can now use technology to achieve faster and more comprehensive results. Consider these data analytics examples for Julia's Cookies:

- **Comparing total flour purchased each month to the amount of flour used:** This will identify excess ordering and inventory waste.
- **Checking whether a vendor sent multiple invoices for the same order:** This will identify if Julia's Cookies has paid the same invoice twice, which is a financial loss.
- **Calculating the number of days it took to pay invoices from a vendor:** This will check whether Julia's Cookies is meeting payment terms that qualify it for payment discounts. It is important because discounts reduce the cost of goods sold and increase profits, as seen in the gross profit margin.
- **Performing a three-way match between the purchase order, the goods received, and the invoice from the vendor:** This is usually performed manually but can be done with data analytics to increase efficiency.

There is nothing innovative about these examples; accounting professionals have been doing these activities for years. However, because tasks like these use data stored in an AIS, data analytics enables faster and more efficient performance.

As accounting tasks continue to become digital and data driven, the skills accounting professionals need are also evolving. Discover how much data is created and stored in less than an hour at Julia's Cookies in Applied Learning 1.4.

Julia's Cookies

Applied Learning 1.4

Accounting Analytics: Capturing Data from Business Events

Martin is a new customer at Julia's Cookies and has signed up for an account on the Julia's Cookies mobile app. He creates a profile and orders a half dozen chocolate chip cookies for immediate delivery to his home address. Forty-five minutes after he initially downloads the mobile app, his first cookie order arrives on his doorstep.

What business events just took place? What data do you think Julia's Cookies' AIS captured in these 45 minutes?

SOLUTION

Multiple business events took place during these 45 minutes:

1. New profile created
2. Cookies ordered
3. Payment collected
4. Cookies baked
5. Cookies delivered

The data captured from these business events includes:

1. Customer profile data: Name, home address, payment method
2. Order data: Cookie type, quantity, price
3. Payment transaction: Payment method, price, taxes, fees, driver tip
4. Inventory: Ingredient inventory depleted
5. Cookies delivered: Delivery time, delivery driver

Data Analytics Skills

Have you ever tracked your grades for a semester in a spreadsheet? What about using that information to calculate the grade you need on a final exam to pass or to earn an A in a class? If you have completed tasks like these in a spreadsheet using formulas to calculate the weights of your grades, then you have performed data analytics.

Data analytics can range from small data transformation in software like Excel to advanced predictive modeling using artificial intelligence. Anyone can perform data analytics, and many people do so regularly without even realizing it. However, advanced analytics requires specialized technology skills—and sometimes even in statistics, depending on the question you want to answer.

Most employers understand that accounting majors already learn a lot in their college programs. Graduating with an accounting degree is no small feat, especially if you pursue eligibility for the CPA exam. If you find the technical aspects of data you learn throughout this course exciting, consider taking some classes—or even double majoring—in information systems or computer science.

That path is not for everyone, though, and not every accounting professional needs to code advanced predictive analytics algorithms in data analytics programming languages. CPA Employers look for candidates who are data minded. Awareness, curiosity, excitement, and creative thinking are just some of the soft skills that show employers you are data minded. Most employers expect that accounting graduates will need to be trained in data analytics.

In the first years of your career, you will need to develop some fundamental data analytics skills to stay relevant. It is unnecessary to be an expert in all the skills in **Table 1.3** the day you graduate, but you will likely be expected to learn them quickly, so start preparing yourself now. The table includes key data analytics skills for new accounting professionals and indicates where these skills are covered in this course.

TABLE 1.3 Essential Data Analytics Skills Course Roadmap

Identify what data can be used to answer a business question	Embedded throughout the course End-of-chapter questions labeled "Data Foundations" End-of-chapter questions labeled "Data Analytics" Julia's Cookies Tableau/Excel Cases accompanying each chapter
Recognize data quality issues	FASB characteristics of useful information in Section 1.3
Know the fundamentals of how data is stored so you can retrieve it	Data Storage and Analysis chapter Database design sections of the Designing Systems and Databases chapter End-of-chapter questions labeled "Data Foundations"
Display data analytics skills that can be applied to any software	End-of-chapter questions labeled "Data Foundations" End-of-chapter questions labeled "Data Analytics"
Perform data analytics using common software like Excel	Julia's Cookies Excel Case accompanying each chapter
Collect, clean, and prepare data	Database design sections of the Designing Systems and Databases chapter Julia's Cookies Tableau/Excel Cases accompanying each chapter
Recognize when advanced data analytics tools are needed	Data Analytics chapter Reporting and Visualization chapter
Perform data visualization and report the results of an analysis	Reporting and Visualization chapter Julia's Cookies Tableau Case accompanying each chapter

To build a solid foundation for your career, focus on applying these skills to your accounting coursework whenever possible.

Featured Professional: Accounting Support Services

Photo courtesy of Miriam Semaan Bolus

Miriam Bolus, CPA

Miriam spent the first three years of her career as an external auditor at a Big Four firm. She then transitioned to her current role as a market accountant in the health care industry, where she provides accounting support services to various ambulatory surgery centers throughout the Southeast market. Miriam has bachelor's and master's degrees in accounting. In addition to her role as an accounting professional, Miriam is active in her local community and participates in various networking and mentorship organizations, including co-chairing the Young Alumni Council of her alma mater.

How do you use data analytics in your current accounting role?

Everyone in accounting performs data analytics to some extent. In my work, I use a report that compares this quarter's financial metrics to the prior quarter's. This report comes from the AIS. However, data analytics showcases which of these metrics are stand out above the threshold, which allows me to focus my time and effort on the critical thinking and judgment aspect by digging into why this metric increased or decreased. Data analytics like this help me provide more value to my team by allowing me to focus more on critical thinking and decision making.

How do you use the characteristics of useful information in your daily work?

Comparability is something we use regularly in data analytics. Our AIS creates reports that show me monthly, yearly, and quarterly analysis, which allows me to compare prior activities to recent activities. This helps me focus on how we're progressing or regressing on specific financial statement line-item areas and what adjustments to make moving forward.

Do you have any tips for current accounting students who are starting internships or their first full-time position?

A positive attitude can go a long way. Remember that you are new to the company, and that will bring challenges. Being a team player, bringing a fresh outlook and positive energy to your team, and seeking out opportunities will help you be successful in your new role. If you face technical challenges, try to do the work yourself first by taking an "initial stab" at things before you turn to your colleagues for help. When you present the problem to your leaders, be ready with a potential solution to showcase you attempted to solve it on your own. Combining a positive attitude with this kind of hard work won't go unnoticed.

Review and Practice

Key Terms Review

accounting information system (AIS)
basic business model
business activity
business event
business model
business process
data analytics
data integrity
decision context
direct-to-consumers business model
enhancing characteristics
financing event
franchise business model
freemium business model
fundamental characteristics
information event
information quality
information system
input
investing event
key performance indicator (KPI)
operating event
output
peer-to-peer business model
process-based information system
purpose of a business
reporting
retailer business model
subscription business model
transaction-based AIS

Learning Objectives Review

1 Explain how accounting affects both the demand for and supply of information.

The demand for accounting information comes from decision makers, who need information about economic activity to help make decisions. The supply of accounting information flows from the information preparers to the decision makers.

Accounting professionals make judgment calls about what most accurately reflects the business reality of economic activity.

An accounting information system (AIS):

- Captures data about business events that give rise to accounting transactions (data input)
- Processes and stores that data (action)
- Reports information in formats that are useful to users (information output)

A business event or activity (such as "Accept customer order") is a definable activity that takes place during the normal operation of a business.

An example of the output from an AIS is a set of financial statements.

To earn profits and generate sufficient cash flow from operations, a business engages in activities called business operations. To succeed, a business needs to use a hierarchical structure:

- Business model(s)
- Business processes
- Business events

Business models are achieved through well-designed business processes. A business process is a group of related business events designed to accomplish the strategic objectives of the business.

A basic business model consists of the three primary types of business processes:

- Acquisitions and payments processes: For acquiring resources
- Conversion processes: For converting resources into a product or service
- Marketing, sales, and collections processes: For selling goods and services and collecting cash

There are four types of business events:

- Operating
- Investing
- Financing
- Information

2 Compare and contrast traditional transaction-based accounting systems with process-based information systems.

Traditional transaction-based accounting information systems record only accounting transactions.

Today, many companies use sophisticated, integrated, process-based information systems, which collect and process all data of interest to the business and connect all the processes. An AIS is a module of an integrated system and not a stand-alone system.

Common resources acquired during the acquisitions and payments processes include:

- Financing
- Property, plant, and equipment
- Employees
- Inventory
- Other goods and services

Conversion processes are at the heart of any business. They convert resources into products or provide services to clients or customers.

The marketing, sales, and collections processes involve marketing and selling products or services and collecting the cash from the sales. The cash flows back to resources and replenishes the cash balance so that the firm can pay its commitments.

3 Explain management's relationship to information and information systems.

Management needs information to make decisions about business processes. Much of this information comes from the output of a company's

information system(s). Management uses this information to determine whether the business is meeting its strategic objectives. The information generated by the information system(s) helps monitor business process outcomes and results in changes and improvements to the processes, which in turn should improve the chances of meeting objectives.

Management is responsible for:

- Planning processes
- Implementing processes
- Monitoring processes
- Changing and improving processes

Business events making up the business processes create the data stored in a company's database(s).

Management combines the principles of information quality and decision context to identify information needs for decision-making activities.

Information quality refers to the suitability of information for a particular purpose in a specific task.

To be useful for decision making, quality information must have two fundamental characteristics:

- Relevance
- Faithful representation

The usefulness of information increases in the presence of four enhancing characteristics:

- Verifiability
- Timeliness
- Understandability
- Comparability

An overall constraint on the usefulness of information is cost-effectiveness.

Decision context refers to the preferences, constraints, and other factors that affect how a decision is made, such as who is going to use the information, and why.

4 Describe the relationship between accounting and data analytics.

By using data that is generated by business events, companies use two processes:

- Reporting is the process of aggregating data into information on the activities and performance in a company.
- Data analytics is the process of using technology to transform raw data, or facts, into useful information.

Management combines the historical performance information provided by reporting with data analytics insights to understand what happened and to make decisions on how to improve business processes.

Data analytics skills that new accounting professionals need:

- Identify what data can be used to answer a business question.
- Recognize data quality issues.
- Know the fundamentals of how data is stored so that you can retrieve it.
- Display data analytics skills that can be applied to any software.
- Perform data analytics using common software like Excel.
- Collect, clean, and prepare data.
- Recognize when advanced data analytics tools are needed.
- Perform data visualization and report the results of an analysis.

CPA questions, as well as multiple-choice, discussion, analysis and application, Tableau questions, and other resources are available online.

Multiple-Choice Questions

1. **(LO 1)** Which of these statements about information systems is correct?
   - **a.** they capture only financial data
   - **b.** they report information in standard format only
   - **c.** they collect, process, store, and analyze data and report information
   - **d.** they are difficult to analyze using traditional software tools
2. **(LO 1)** Accounting information systems differ from larger business information systems in that they
   - **a.** consist of a subset of the data stored in the entire information system
   - **b.** focus on data from business events involving exchanges of economic resources
   - **c.** collect, process, store, and analyze data and report information
   - **d.** all of these are correct
3. **(LO 1)** How does data differ from information?
   - **a.** data is input; information is output
   - **b.** information is input; data is output
   - **c.** data is ready to be used; information must be processed
   - **d.** information is generated by business events; data is used for decision making
4. **(LO 1)** Which of the following is *not* a business event?
   - **a.** hire a new employee
   - **b.** order raw materials
   - **c.** deliver goods to customer
   - **d.** accounts receivable
5. **(LO 1)** Which of the following best defines ESG in a business context?
   - **a.** a company's operational plan focused solely on maximizing profits
   - **b.** a company's strategy to reduce product prices and increase competition in the market
   - **c.** a framework to assess a company's performance on environmental, social, and governance issues, with a strong focus on sustainability and climate change
   - **d.** a method for calculating a company's profit margins by analyzing its revenue sources

6. **(LO 2)** In which of the three types of business processes in the basic business model does a business deliver products to its customers?

a. sales and collections
b. acquisitions and payments
c. conversion
d. delivery contracts

7. **(LO 2)** In which of the three types of business processes in the basic business model does a business interact with vendors?

a. sales and collections
b. acquisitions and payments
c. conversion
d. accounts receivable

8. **(LO 2)** In which of the three types of business processes in the basic business model does a business transform resources into a product or service that customers want?

a. sales and collections
b. acquisitions and payments
c. conversion
d. accounts receivable

9. **(LO 2)** Which of these business events does *not* result in an accounting transaction?

a. declare a dividend
b. pay a dividend
c. order supplies from vendor
d. deliver product to customer

10. **(LO 2)** Which of these business events results in an accounting transaction?

a. monitor production defects
b. receive damaged goods back from customer
c. evaluate employee performance
d. measure carbon footprint

11. **(LO 2)** McDonald's could have avoided massive financial losses from changing its conversion processes if it had

a. used data to analyze market trends and customer desires
b. used robots to create the made-to-order meals
c. spent more money on marketing
d. changed them sooner

12. **(LO 3)** Which of the following is *not* a characteristic that makes information useful?

a. relevant
b. cost-effective
c. timely
d. neutral

13. **(LO 3)** In the iterative relationship of data-driven decision making, what occurs after business events create data?

a. management decision making
b. business process updates
c. transformation of raw data into useful information
d. control activities through monitoring

14. **(LO 3)** The information quality characteristic that refers to knowledgeable and independent people reaching agreement about whether information is representative of a real-world fact or occurrence is

a. relevance
b. faithful representation
c. verifiability
d. reliability

15. **(LO 3)** A synonym for faithful representation is

a. accuracy
b. verifiability
c. neutrality
d. understandability

16. **(LO 3)** CPA In terms of the qualitative characteristics of financial information, which of the following presents a fundamental qualitative characteristic?

a. relevance
b. timeliness
c. comparability
d. verifiability

17. **(LO 3)** CPA A software company is assessing various metrics such as average revenue per user, customer acquisition cost, customer satisfaction and retention, and number of new and existing customers. Which of the following best describes this initiative?

a. data analytics
b. KPIs
c. financial analytics
d. data modeling

18. **(LO 3)** CPA Which of the following KPIs (ratios) would be used to evaluate a company's profitability?

a. current ratio
b. inventory turnover ratio
c. debt to total assets ratio
d. gross margin ratio

19. **(LO 3)** According to the chapter, how can ESG initiatives help companies gain a competitive advantage?

a. by reducing the number of employees needed in the production process
b. by allowing companies to charge higher prices for identical products
c. by improving innovation and efficiency in business processes, which can differentiate them in the market
d. by eliminating the need for raw materials and reducing production costs entirely

20. **(LO 4)** Data analytics is the process of using technology to transform

a. business event data into business process data
b. data into useful information
c. accounting data into business data
d. unreliable data into reliable data

21. **(LO 4)** CPA Accountants play various roles in working with data. Which one of the following is not typically one of those roles?

a. assessing the quality and integrity of data
b. using data to assess risks

c. building systems for big data

d. analyzing data for business insights

22. **(LO 4)** The two types of outputs that are generated with data created during a business event are reports and

a. timesheets

b. invoices

c. analytics

d. decisions

23. **(LO 4)** Which of the following is an important skill related to data analytics that new accounting professionals need to learn?

a. how to code programming languages

b. how to use statistical algorithms

c. web design

d. how to recognize data quality issues

Discussion and Research Questions

DQ1. **(LO 1)** Find or create two memes: (1) one that demonstrates common misconceptions about accounting professionals and what they do and (2) one that shows the reality of the work that accounting professionals do. The second meme can also show the reason you chose to be an accounting major.

DQ2. **(LO 1)** Explain to your supervisor how accounting (1) meets the demand for information while at the same time it (2) affects the supply of information. Use the Pathways Vision Model in Illustration 1.2 as a reference.

DQ3. **(LO 1)** **Critical Thinking** You have successfully taught yourself how to program apps by using online resources like Datacamp, Coursera, and Codecademy. You have an idea for a new app that will inform students whether their backpacks are missing important items on a particular day, like textbooks, Scantron forms for exams, laptops, or financial calculators. You develop a business plan and win the $50,000 first prize in a competition run by Innovation Depot, the epicenter for technology startups in Birmingham, Alabama. You are about to graduate, and you want to launch your own startup with the prize money. At a high level, explain (1) the primary purpose of business and how it relates to your business, (2) your business model in terms of inputs of resources and outputs of goods and services (refer to Illustration 1.11 for guidance), and (3) the cash flow implications of your business model, including how you are going to generate cash.

DQ4. **(LO 1)** Explain the relationship between business events and business processes.

DQ5. **(LO 1)** Explain how accounting information differs from other information in an information system.

DQ6. **(LO 2)** Using an example, explain how the context in which a decision is made can have a significant impact on the prioritization of the characteristics of quality information.

DQ7. **(LO 2)** **Critical Thinking** You have launched a successful business that is starting to grow. You are considering the acquisition and implementation of a process-based information system. Explain to your business partner, who is a traditional accountant, the relationship between business processes and the information system and how a traditional accounting system differs from a process-based system.

DQ8. **(LO 2)** For acquisitions and payments processes, identify four examples of socially responsible business activities for which data can be collected. This data could be financial or nonfinancial. Identify the related resource—for example, raw materials, supplies, human resources, and fixed assets.

DQ9. **(LO 2)** For a firm that manufactures off-road vehicles, identify four examples of socially responsible business activities for which nonfinancial data related to the conversion process can be collected.

DQ10. **(LO 2)** At a conceptual level, discuss whether business processes determine the information system or whether the information system determines the business processes.

DQ11. **(LO 3)** Describe each of the following management functions: (1) planning, (2) implementing, (3) monitoring, and (4) changing and improving. Explain the relationship between these functions and a firm's information system.

DQ12. **(LO 3)** What is quality information? Choose one fundamental characteristic and one enhancing characteristic of quality information. Compare and contrast what makes each of your choices a fundamental versus an enhancing characteristic. Provide an example that demonstrates why information quality would be compromised if the chosen fundamental characteristic did not have the enhancing characteristic.

DQ13. **(LO 3)** How can companies balance profitability with the costs of implementing ESG initiatives, such as reducing their carbon footprint or enhancing social responsibility efforts, without compromising their competitive advantage?

DQ14. **(LO 4)** **Early Career** **Data Foundations** Use the internet to research skills related to data analytics that accounting professionals need. You can look at websites from global and regional accounting firms to see the types of services they offer or look at LinkedIn for job postings in your area or a major metro area near you. List at least five technical, data-related skills and identify where you found each of them.

Application and Analysis Questions

A1. **(LO 1)** **Critical Thinking** If you walk into a local coffee shop and order a fresh-baked scone from the cashier, a variety of business events will take place. Identify at least four business events, in order, and label each of them as an operating event or an information event.

A2. **(LO 2)** For each of the business events listed in the following table, (1) identify the business process for the event in a process-based approach and (2) identify the traditional accounting cycle(s) for the event. For nonaccounting events, write "not applicable."

Business Event	Business Process Approach	Traditional Accounting Cycle(s)
1. Ship goods to credit customer	Sales and collection	Revenue/accounts receivable
2. Pay hourly employees for the week		
3. Sell goods for cash		
4. Order a new factory machine		
5. Receive raw materials from vendor		
6. Receive payment from credit customer		
7. Take out a loan to pay for new factory machine		
8. Pay a dividend to shareholders		
9. Manufacture a product		
10. Write off an uncollectible account		
11. Issue new common stock		

A3. **(LO 3)** **Data Foundations** **Critical Thinking** You have a table full of data and have started finding some quality issues in it. Go through the extract below and identify the data quality issues that you notice, the field in which each issue occurs, and how you would fix it. Choose from the following data quality characteristics: comparability (consistency), understandability, error free, completeness, confirmatory value.

ID	Date	Item	Customer First Name	Customer Last Name	Amount
000238	4/8/2026	Chocolate chip cookies	Johnny	Ramirez	$9.56
239	4/9/2026	Oatmeal raisin cookies	Johnny	Ramirez	$8.51
000240	4/31/2026	Snickerdoodle cookies	Julia	Rodriguez	$4.20
000241	4/10/2026	PBC	Annette	Ãlvarez	$6.51
000242	4/11/2026	Chocolate chip cookies	Brian		$11.23

A4. **(LO 3)** **Critical Thinking** For each of the information situations listed below, match the following information quality characteristic that either most accurately applies to the situation or would be the best characteristic to improve the information. Where more than one characteristic could apply, choose the most appropriate one.

Information quality characteristics:

A. Completeness
B. Relevance
C. Predictive value
D. Understandability
E. Timeliness
F. Faithful representation
G. Confirmatory value
H. Comparability

	Information Situation	Characteristic
1.	This characteristic is a decisive factor in reporting land and buildings at historical cost in a company's Balance Sheet, even though this value may not resemble the asset's fair market value.	
2.	In a company's Income Statement, sales transactions included in the revenue amount are only those that reflect revenue earned during the reporting period—no more and no less.	
3.	In the management decision to replace a long-haul transportation truck used for the past ten years, the inclusion of information about the original cost of the truck in a report has no _____ (fill in the characteristic).	
4.	Disney World provides guests with Magic Bands, which are wristbands that collect data on who the guests are, where they are, what rides they go on, and what they buy. Disney characters greet children wearing the bands by name. Magic Bands provide Disney with an incredible amount of data about guest profiles and preferences. Information like this can help Disney improve decision making for optimal management of its resorts.	
5.	Alicia's Accessories is developing a proprietary big data system called Just-in-Time. The system's purpose is to continuously monitor and improve operations, products, marketing, sales, and employee training and enhance competitive advantage. The data comes from the company's point-of-sale systems, inventory systems, promotions, customer feedback and surveys, and loyalty programs. Just-in-Time provides information every 30 minutes at headquarters for immediate decision making. Operational glitches get immediate attention.	

	Information Situation	Characteristic
6.	Oil and gas companies consistently apply the same industry-specific accounting standards to their financial statements, so there should be a high level of _____ (fill in the characteristic) within that industry.	
7.	A company with information about a probable and material lawsuit must report it in the notes to its financial statements. An attempt to withhold this information indicates bias and *not* _____ (fill in characteristic).	
8.	Financial statements include information on cash flows so that financial analysts and investors can evaluate the accuracy of their past predictions.	
9.	Financial analysts and investors use past financial statements to chart performance trends and make predictions about future performance, including profitability and cash flow, for business valuation purposes.	

A5. (LO 1, 2, 3, 4) For each of the business events listed, (1) identify it as an operating, investing, or financing event or activity; (2) identify a related information event; and (3) identify a related decision activity.

	Business Event/Activity	O, I, or F?	Related Information Event	Related Decision Activity
1.	Ship goods to a credit customer	O	Retrieve a report that compares shipment date to delivery date and shows time taken for successful delivery	Monitor efficiency and effectiveness of couriers
2.	Pay hourly employees for the week			
3.	Return a defective product to the supplier			
4.	Purchase a new computer			
5.	Receive raw materials from a vendor			
6.	Pay an invoice received from a vendor			
7.	Take out a loan to pay for a new factory machine			
8.	Pay a dividend to shareholders			
9.	Manufacture a product			
10.	Write off an uncollectible account			
11.	Issue new common stock			

A6. (LO 1, 2, 3, 4) Early Career critical_thinking Clever Cabinets is a small but growing company specializing in the manufacture and installation of a variety of cabinets and fixtures. The company has approximately 55 employees. It does commercial subcontracting work for general contractors like construction firms. The company's work results from a competitive bidding process, and the final price is fixed. The company bears the risk of a loss if the bid is too low.

Management is concerned about the lack of integration between the company's traditional accounting and other management information systems. Inputs of the same data take place multiple times because of disconnected information systems and lack of a single database for the company. Recently, an audit revealed that the same data item had different values in different systems, resulting in a lack of data integrity and a lack of trust in the information delivered by these disparate systems. Clever Cabinets retains the CPA firm where you are an intern to propose an integrated, process-based information system to help the business grow with a more value-added emphasis and with access to better information.

Your manager sends you on a site visit to Clever Cabinets. You take the following notes about the current system for the acquisition and payment of raw materials, plus some additional information for later use:

> Generic purchasing, which is the purchase of raw materials common to all jobs (such as plywood, glue, and nails) is on an as-needed basis, depending on how low inventory levels are or on the deal the company can get from a supplier at a particular time. When a supplier offers a good deal to the company, it often results in bulk purchases. The purchasing manager generates a purchase order (PO) for the supplier without a purchase requisition (PR). The main difference between a PO and a PR is that firms use a PR to authorize a purchase. This authorization happens before the issuance of a purchase order to the vendor. A PR often starts the purchasing process.

The request to buy raw materials for a successfully bid job comes from the job cost estimator. If a bid is successful, the estimator issues a PR unique to a particular bid job. The PR contains product descriptions, quantity, bid purchase price, and (often) vendor name. The purchasing manager reviews the PR to determine which raw materials are already in inventory (the result of generic purchasing). If the materials are not in stock, they prepare a PO based on the information shown on the PR and send it to the supplier.

An employee in the Receiving department accepts delivery of an order and signs the vendor-generated delivery report as proof of receipt. A copy of the proof of receipt goes to accounts payable, and the delivered goods go into the raw materials store. The various manufacturing supervisors remove raw materials from the store as required. There is no perpetual inventory system.

Once the accounts payable clerk receives the PR (optional), PO, and vendor-generated receiving record, they update the accounts

payable records. Upon receipt of the vendor invoice, they match all these documents. They prepare a check on the due date for signing by an authorized signatory. The check signatory cancels the supporting documentation at this point. The accounts payable clerk mails the check to the vendor and updates the accounts payable records.

In discussions with management, you find out that the company wants to incorporate the following into a business process approach for the acquisition of raw materials:

- Cost Accounting and Inventory Management want to adopt a perpetual inventory system using the weighted average inventory valuation method.
- When materials requisitions for raw materials are sent to the materials store, store employees will check inventory on hand and decide what to order. Stores employees will issue a purchase requisition for inventory that is not on hand, and they will immediately issue items that are on hand to production. The new rule is that a materials requisition must support removal of raw materials from the storeroom. A stores person should be the only person with physical access to the raw materials.
- The Purchasing department receives all purchase requisitions. It aggregates purchase requisitions to get bulk discounts and issues purchase orders to individual vendors. For generic (bulk) inventory items, the Purchasing department sets a minimum order quantity, and the perpetual inventory system triggers a purchase requisition to purchasing when it reaches a minimum level for an inventory item. This happens once a day, with all reorder items for that day listed on one request.
- The stores person checks receipts of new shipments and signs the delivery documents accompanying the order as evidence of receipt of all goods in good order. The stores person also generates a receiving report detailing the quantity and description of accepted items. Rejected shipments go back to the vendor.
- The receiving report then goes to accounts payable for payment of the correct amount to the vendor on the due date.

You are back at the office, and you are getting ready for a meeting with your manager to discuss your findings. To prepare for this meeting, you must perform the following tasks:

1. List the business events that lead to accounting transactions in the traditional expenditures and accounts payable accounting system, based on the existing system.
2. List, in sequential order, the business events that apply to the proposed process-based acquisitions and payments system for raw materials. Identify those events that give rise to accounting transactions, and compare this answer to your answer to question 1. What do you notice?
3. Identify three other possible monitoring activities in the new process-based system that a traditional accounting system would not record.

Pop-up Stall Scenario

Answer questions A7 and A8 using this scenario.

You are opening a limited-time pop-up coffee stall in your campus's business building. Your pop-up will use the space of an existing sandwich shop that is only open from 11:00 a.m. to 2:00 p.m. Monday through Friday. Your coffee stall will be open from 3:00 p.m. through 9:00 a.m. the three weeks leading up to and during midterms and finals weeks. The sandwich shop already has a lot of things you need, like refrigerator space and display counters, but it doesn't have any coffee equipment.

A7. (LO 1, 2, 3, 4) Critical Thinking Match the following business events related to setting up and operating your pop-up to one of the three types of business processes discussed in Learning Objective 1.1:

A. Acquisitions and payments processes

B. Conversion processes

C. Marketing, sales, and collections processes

	Business Event	Business Process
1.	Buy an espresso machine	
2.	Transfer the receipts from today from your mobile payment app to your pop-up's bank account	
3.	Sell your first latte	
4.	Pay your friends who work as baristas at the end of the week	
5.	Pay for pour-over coffee filters	
6.	Pay a fair-trade coffee provider for beans delivered last week	
7.	Prepare batches of cold brew to steep overnight the night before it is sold	
8.	Order a custom chalkboard sign from an Etsy shop for your daily menus	
9.	Make a macchiato for a customer	
10.	Order milk from a local dairy farm's stall at a farmer's market that will be delivered next Tuesday	
11.	Bake scones to sell the next day	
12.	Send your customer an e-receipt via text message	

A8. (LO 1, 2, 3, 4) Data Foundations Critical Thinking Your university approved your pop-up for this semester, but those in charge want to see if you are successful before they approve your opening again in future semesters. Choose three of the following pieces of information that you collected while operating your pop-up, state which of the three business processes generated each piece of information and explain how you would use those three pieces of information together to show the university which parts of your pop-up were successful or failed.

1.	Total number of coffees sold (including all types)	3,600
2.	Total amount earned (before depreciation)	$ 18,000.00
3.	Cost of all ingredients and supplies purchased	$ 3,026.00
4.	Cost of fixed asset purchases (like espresso machine)	$ 1,598.00
5.	Cost of paying baristas	$ 8,640.00
6.	Average wait time (length of line)	15 minutes
7.	Total number of students who had finals during this time	6,523
8.	Total number of customers	242

A9. (LO 1, 2, 3, 4) **Data Foundations** **Critical Thinking** You are running four successful popsicle stores in Los Angeles and are about to prepare a purchase order for raw materials for each store but need to know how much to purchase. Your stores are in four different city areas, but you don't want to drive around to physically count the inventory. Furthermore, you have learned that, for each of the stores, sales differ drastically by customer preferences for different popsicle flavors. You decide to utilize your database to perform some analytics prior to placing the order. What type of information should you gather to make an inventory decision without physically seeing the inventory? Identify three sources of information. How would you use the information to calculate your inventory needs?

A10. (LO 1, 2, 3, 4) In the following table, match each item from List A with the appropriate items from List B. Each item on List A match with more than one item on List B.

List A	List B	Answer
A. The practice of accounting	**1.** Input into an information system	10
B. Sales and collections processes	**2.** No connection to business events	
C. Conversion processes	**3.** Profits not declared or paid as dividends	
D. Data	**4.** Order raw materials from vendor	
E. Acquisitions and payments processes	**5.** Inputs of resources into a business	
F. Output	**6.** Information or product	
G. Cost versus benefit	**7.** Timeliness and verifiability	
H. Misperception(s) about accounting	**8.** Acquire and retain customers	
I. Enhancing characteristics of information quality	**9.** Business event	
J. Information quality	**10.** Serves the public interest and promotes prosperity	
K. Take customer order	**11.** Combine resources to add value	
L. Retained earnings	**12.** Rigid black-or-white rules; no flexibility in accounting choices	
	13. There is no match for this item	

Tableau Case: Julia's Cookies Characteristics of Useful Information

What You Need

Download Tableau to your computer. You can access www.tableau.com/academic/students to download your free Tableau license for the year, or you can download it from your university's software offerings.

Download and save the following file:

Chapter 1 Raw Data.xlsx

Case Background

Big Picture:
Assess the provided Cookies Cares Charitable Foundation data for the fundamental characteristics of useful information.

Details:
Why is this data important, and what questions or problems need to be addressed?

- It is important to familiarize yourself with the way the fundamental characteristics of useful information appear in a data set so that you will understand how to successfully work with data in your accounting career.
- To assess this data for the fundamental characteristics of useful information, consider the following questions: Is the data complete? Will the data likely impact users' judgment when making decisions? Are there errors in the data?

Plan:
What data is needed, and how should you use it?

- The data needed is captured by the Accounts Payable department and extracted from the database that supports the Financial module of the ERP system. Accounts Payable manages the charitable giving process because charitable donations are business expenses that are subject to specific internal controls.
- To isolate the charitable giving expenses for the Cookies Cares Charitable Foundation, the data is filtered on the Cost Center field to only show cost center 12542. Cost centers identify the departments where expenses are allocated. The data includes charitable donation expenses from 1/1/2019 through 12/31/2022.
- To assess this data for the fundamental characteristics of useful information, you'll need the following control total information:
  - Julia's Cookies uses four banks to process charitable donations: Walls Fargo, Bank of America, Truist, and PNC.
  - The total dollar amount of charitable donations from FY19 to FY22 is $13,228,869.79.
  - The total number of charitable donations per year are:
    - FY19: 159 donations
    - FY20: 215 donations
    - FY21: 404 donations
    - FY22: 565 donations

Now it's your turn to evaluate, analyze, and communicate the results!

Questions

1. What is the total dollar amount of charitable donations from FY19 to FY22 in the data provided?
2. What is the total dollar amounts of charitable donations per year in the data provided?
3. What is the total number of charitable donations from FY19 to FY22 in the data provided?
4. What is the total number of charitable donations per year in the data provided?
5. How many banks are included in the data provided?
6. Which bank processed the highest total dollar amount of charitable donations in the data provided?
7. Using the control total information provided and your answers from Questions 1–6, which of the two fundamental characteristics of useful information is *not* present in the data provided?
8. Based on your data exploration so far, which of the following is the most likely hypothesis for your answer to Question 7?
   a. The provided data does not include FY23
   b. The provided data does not impact users' judgment for decision making
   c. The provided data does not include charitable donations processed by Truist
   d. The provided data includes an additional cost center that is not related to charitable donations

Take it to the next level!

Julia's Cookies has pledged to focus on its ESG commitments for FY24. As part of this pledge, Julia's Cookies is targeting a goal of increasing the dollar amount of charitable donations by 5% year-over-year.

9. By what percentage did Julia's Cookies increase its dollar amount of charitable donations between (a) FY19 to FY20, (b) FY20 to FY21, and (c) FY21 to FY22? (Round to the nearest two decimal places)
10. Based on your answer to Question 9, do you think that Julia's Cookies can meet its FY24 target of increasing the dollar amount of charitable donations by 5% year-over-year?
    a. Yes
    b. No
11. In addition to the issue you identified in Question 8, which enhancing characteristic of useful information is *not* present in the provided data that may impact your predictions in Question 10?
    a. Comparability
    b. Understandability
    c. Relevance
    d. Timeliness