

CHAPTER

9

Achieving Operational Excellence and Customer Intimacy: Enterprise Applications

LEARNING OBJECTIVES

After reading this chapter, you will be able to answer the following questions:

- 9-1** How do enterprise systems help businesses achieve operational excellence?
- 9-2** How do supply chain management systems coordinate planning, production, and logistics with suppliers?
- 9-3** How do customer relationship management systems help firms achieve customer intimacy?
- 9-4** What are the challenges that enterprise applications pose, and how are enterprise applications taking advantage of new technologies?
- 9-5** How will MIS help my career?

CHAPTER CASES

- Warehouse Management at Norauto: Conversational Commerce
- Soma Bay Prospers with ERP in the Cloud
- CRM Helps Adidas Know Its Customers One Shoe Buyer at a Time
- Fast Fashion, Big Data, and Zara

VIDEO CASES

- Maersk Develops a Global Shipping Management System
- Instructional Video:*
- GSMS Protects Patients by Serializing Every Bottle of Drugs

MyLab MIS

- Discussion Questions:
9-5, 9-6, 9-7
- Hands-on MIS Projects:
9-8, 9-9, 9-10, 9-11

WAREHOUSE MANAGEMENT AT NORAUTO: CONVERSATIONAL COMMERCE

Norauto is one of the leading international companies in the auto maintenance and equipment market. The group has its headquarters in Northern France, and since the turn of the millennium, it has expanded considerably into Western Europe and South America. It did so by acquiring a number of brands, including Midas, Auto5, and Maxauto, and by establishing the brand Carter Cash, which sells cost-effective tires, auto parts, and accessories.

As a result of all these moves, Norauto's points of sale mushroomed and its turnover sped up. Given the volume and diversity of its product range, Norauto decided in 2004 to acquire a new supply chain execution application for better management of product flow from its five warehouses to its 350 automotive stores. The objectives included boosting operational productivity in logistics and minimizing the error rate in order fulfilment.

Norauto turned to Manhattan Associates for a scalable substitution for its legacy warehouse management system. The new system was compatible with the automotive traceability standards and integrated seamlessly with the company's back-end ERP system from SAP for data exchange.

The initiative was first launched in the distribution center at Lesquin in Northern France, which managed 60,000 lines of orders and 250,000 products per week in a space of 13,000 square meters. The warehouse adopted a voice recognition solution by Vocollect whereby work assignments are recomposed as synthesized speech and transmitted to the headset of one of 30 order-pickers via a battery-powered wearable computer. A warehouse associate follows the instructions and goes to the correct aisle, then states the pre-assigned check code at the product's location into the headset. The voice recognition software on the pocket computer converts the words to text and sends the data back to the warehouse management system. The worker must read out the correct code before the server will give further instructions, such as which models and quantities to pick.

Compared with paper-based and scanner-based systems, voice-based order picking is an ergonomic, hands-free operation that allows workers to pay full attention to the task at hand and be more alert to the environment, thus decreasing mistakes and unproductive time and



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increasing safety levels. Verbal order confirmation further lowers the error rate. The system is so easy to use that any warehouse worker can quickly master the tool with a little training and practice. This flexibility allows the company to employ temporary warehouse workers during peak seasons with relatively low overhead.

The new system reduced the error rates by 75 percent, and the order-fulfilment accuracy level was 99.9 percent in the first four months after the deployment. The project's investment was returned in less than a year. Moreover, the solution enabled Norauto to provide better services to its customers. In 2019, Norauto partnered with Uber to provide maintenance on the rideshare company's 30,000-vehicle French fleet.

With Norauto's expansion in Western Europe and South America, many of its service centers are now operated by franchises. Had it not dealt with the logistics issue in time, the auto maintenance chain would not have been able to expand its scale of operation exponentially.

Sources: "Norauto Has Been Chosen by Uber to Service Its Vehicles," by Justine Perou, *Pro.largus.fr*, October 8, 2019; "Norauto Optimises Supply Chain Performance by Combining Manhattan Associates Supply Chain Solutions Capability with SAP Enterprise Systems Expertise," *Business Wire*, August 31, 2006; "Norauto Revs up Supply Chain Performance with Manhattan Associates' Solutions, Manhattan Associates," *Manh.com*, accessed January 12, 2019; "Voice Recognition Technology Is Here! And It Can Hear You," *Supply Chain Game Changer*, January 4, 2019; "Can Your Supply Chain Hear Me Now?," by Brian Subirana, Sanjay Sarma, James Rice, and Ken Cottrill, *Frontier, MIT Sloan Management Review*, May 7, 2018; "Next-Level Productivity for Voice Directed Picking," by Roberto Michel, July 9, 2018.

Case contributed by Joyce Chan, City University of Hong Kong

Norauto's challenges with warehouse management illustrates the importance of supply chain management to a business's success. The case shows how the implementation of the right supply chain management system can improve the operation and the development of an enterprise.

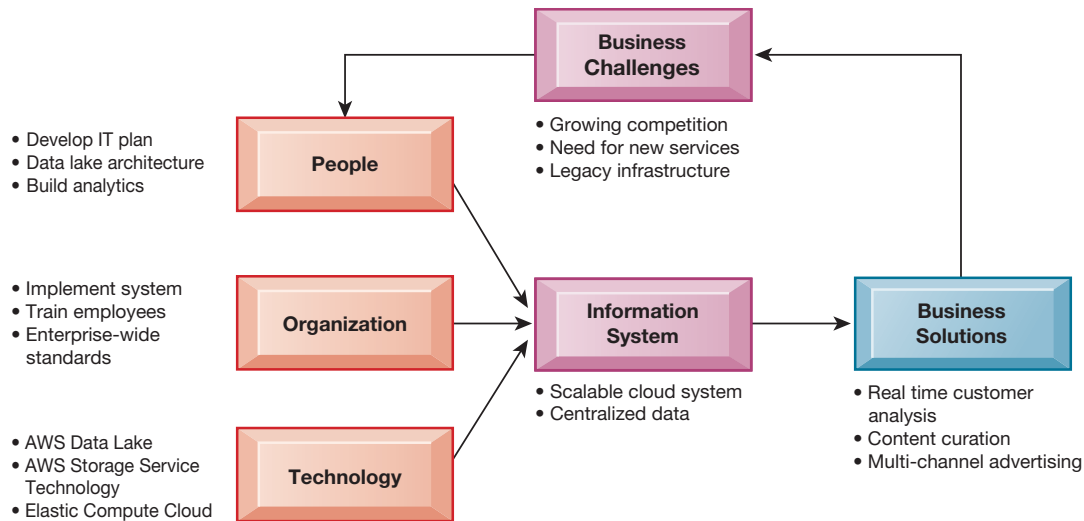
The chapter-opening diagram calls attention to important points raised by this case and this chapter. Norauto operates in several countries and sells products of various types in large quantities. The company needs to trace its products following industry standards. The company's proprietary warehouse management system was too costly to maintain and not efficient enough to cope with its rapid growth. It was crucial for Norauto to revamp its supply chain workflow, especially as it was trying to attract franchisees.

Norauto's management launched a business process reengineering project and looked for a supply chain system that could fulfill their needs and integrate with the ERP system. Slot optimization made the company redesign its stock location management and product-picking process in its warehouses. Implementing the centralized warehouse management system by Manhattan Associates and the voice-based order-picking system by Vocollect allowed Norauto to reduce warehouse administration, decrease operation costs, optimize inventory levels, and streamline the supply chain. The solution contributed to higher labor productivity, higher order-fulfilment accuracy, and workforce scalability in a more efficient work environment.

Here are some questions to think about: How would you evaluate Norauto before it improved its supply chain system and business process? How did the new supply chain solution affect the warehouse workers and the company?

9-1 How do enterprise systems help businesses achieve operational excellence?

Around the globe, companies are increasingly becoming more connected, both internally and with other companies. If you run a business, you'll want to be able to react instantaneously when a customer places a large order or when a shipment from a supplier is delayed. You may also want to know the impact of these events on



every part of the business and how the business is performing at any point in time, especially if you're running a large company. Enterprise systems, one of the enterprise applications introduced in Chapter 2, provide the integration to make this possible. Let's look at how they work and what they can do for the firm.

WHAT ARE ENTERPRISE SYSTEMS?

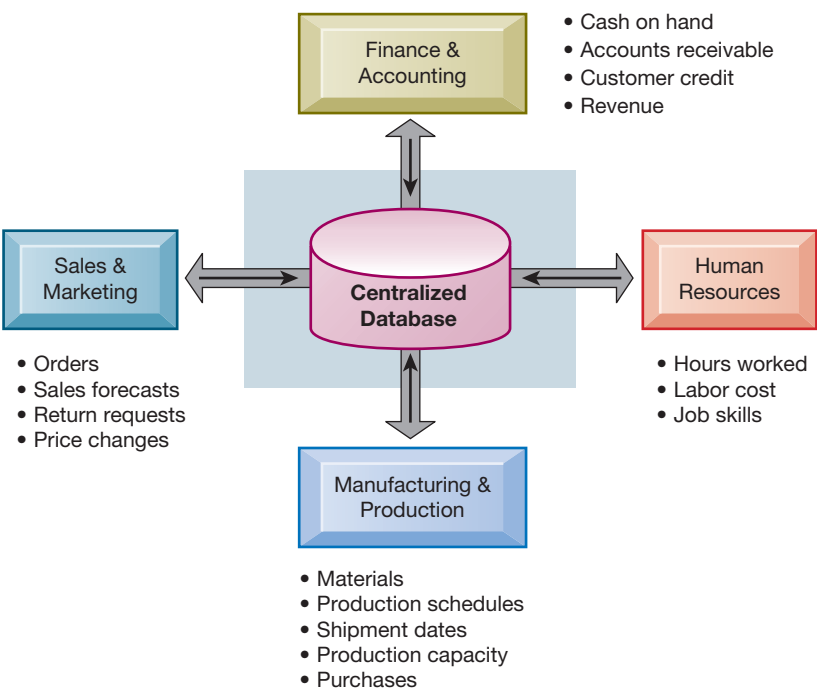
Imagine that you had to run a business based on information from tens or even hundreds of databases and systems, none of which could speak to one another. Imagine your company had 10 major product lines, each produced in separate factories, and each with separate and incompatible sets of systems controlling production, warehousing, and distribution.

At the very least, your decision making would often be based on manual hard-copy reports, often out of date, and it would be difficult to understand what is happening in the business as a whole. Sales personnel might not be able to tell at the time they place an order whether the ordered items are in inventory, and manufacturing could not easily use sales data to plan for new production. You now have a good idea of why firms need a special enterprise system to integrate information.

Chapter 2 introduced enterprise systems, also known as enterprise resource planning (ERP) systems, which are based on a suite of integrated software modules and a common central database. The database collects data from many divisions and departments in a firm and from a large number of key business processes in manufacturing and production, finance and accounting, sales and marketing, and human resources, making the data available for applications that support nearly all an organization's internal business activities. When new information is entered by one process, the information is made immediately available to other business processes (see Figure 9.1).

If a sales representative places an order for tire rims, for example, the system verifies the customer's credit limit, schedules the shipment, identifies the best shipping route, and reserves the necessary items from inventory. If inventory stock is insufficient to fill the order, the system schedules the manufacture of more rims, ordering the needed materials and components from suppliers. Sales and production forecasts are immediately updated. General ledger and corporate cash levels are automatically updated with the revenue and cost information from the order. Users can tap into the system and find out where that particular order is at any minute. Management can obtain information at any point in time about how the business is operating. The

Figure 9.1
How Enterprise Systems Work.
Enterprise systems feature a set of integrated software modules and a central database by which business processes and functional areas throughout the enterprise can share data.



system can also generate enterprise-wide data for management analyses of product cost and profitability.

ENTERPRISE SOFTWARE

Enterprise software is built around thousands of predefined business processes that reflect best practices. Table 9.1 describes some of the major business processes that enterprise software supports.

Companies implementing this software first have to select the functions of the system they wish to use and then map their business processes to the predefined business processes in the software. (One of our Learning Tracks shows how SAP enterprise software handles the procurement process for a new piece of equipment.) Configuration tables provided by the software manufacturer enable the firm to tailor a particular aspect of the system to the way it does business. For example, the firm could use these tables to select whether it wants to track revenue by product line, geographical unit, or distribution channel.

TABLE 9.1
Business Processes Supported by Enterprise Systems

Financial and accounting processes , including general ledger, accounts payable, accounts receivable, fixed assets, cash management and forecasting, product-cost accounting, cost-center accounting, asset accounting, tax accounting, credit management, and financial reporting
Human resources processes , including personnel administration, time accounting, payroll, personnel planning and development, benefits accounting, applicant tracking, time management, compensation, workforce planning, performance management, and travel expense reporting
Manufacturing and production processes , including procurement, inventory management, purchasing, shipping, production planning, production scheduling, material requirements planning, quality control, distribution, transportation execution, and plant and equipment maintenance
Sales and marketing processes , including order processing, quotes, contracts, product configuration, pricing, billing, credit checking, incentive and commission management, and sales planning

If the enterprise software does not support the way the organization does business, companies can rewrite some of the software to support the way their business processes work. However, enterprise software is unusually complex, and extensive customization may degrade system performance, compromising the information and process integration that are the main benefits of the system. If companies want to reap the maximum benefits from enterprise software, they must change the way they work to conform to the business processes defined by the software.

To implement a new enterprise system, Tasty Baking Company identified its existing business processes and then translated them into the business processes built into the SAP ERP software it had selected. To ensure that it obtained the maximum benefits from the enterprise software, Tasty Baking Company deliberately planned for customizing less than 5 percent of the system and made few changes to the SAP software itself. It used as many tools and features that were already built into the SAP software as it could. SAP has more than 3,000 configuration tables for its enterprise software.

Leading enterprise software vendors include SAP, Oracle, IBM, Infor Global Solutions, and Microsoft. Versions of enterprise software packages are designed for small and medium-sized businesses and on-demand software services running in the cloud (see Section 9-4).

BUSINESS VALUE OF ENTERPRISE SYSTEMS

Enterprise systems provide value by both increasing operational efficiency and providing firmwide information to help managers make better decisions. Large companies with many operating units in different locations have used enterprise systems to enforce standard practices and data so that everyone does business the same way worldwide.

Coca-Cola, for instance, implemented a SAP enterprise system to standardize and coordinate important business processes in 200 countries. Lack of standard, companywide business processes had prevented the company from using its worldwide buying power to obtain lower prices for raw materials and from reacting rapidly to market changes.

Enterprise systems help firms respond rapidly to customer requests for information or products. Because the system integrates order, manufacturing, and delivery data, manufacturing is better informed about producing only what customers have ordered, procuring exactly the right number of components or raw materials to fill actual orders, staging production, and minimizing the time that components or finished products are in inventory.

Alcoa, the world's leading producer of aluminum and aluminum products with operations spanning 31 countries and more than 200 locations, had initially been organized around lines of business, each of which had its own set of information systems. Many of these systems were redundant and inefficient. Alcoa's costs for executing requisition-to-pay and financial processes were much higher, and its cycle times were longer than those of other companies in its industry. (Cycle time refers to the total elapsed time from the beginning to the end of a process.) The company could not operate as a single worldwide entity.

After implementing enterprise software from Oracle, Alcoa eliminated many redundant processes and systems. The enterprise system helped Alcoa reduce requisition-to-pay cycle time by verifying receipt of goods and automatically generating receipts for payment. Alcoa's accounts payable transaction processing dropped 89 percent. Alcoa was able to centralize financial and procurement activities, which helped the company reduce nearly 20 percent of its worldwide costs.

Enterprise systems provide much valuable information for improving management decision making. Corporate headquarters has access to up-to-the-minute data on sales, inventory, and production and uses this information to create more

accurate sales and production forecasts. Enterprise software includes analytical tools to use data the system captures to evaluate overall organizational performance. Enterprise system data have common standardized definitions and formats that are accepted by the entire organization. Performance figures mean the same thing across the company. Enterprise systems allow senior management to find out easily at any moment how a particular organizational unit is performing, determine which products are most or least profitable, and calculate costs for the company as a whole. For example, Alcoa's enterprise system includes functionality for global human resources management that shows correlations between investment in employee training and quality, measures the companywide costs of delivering services to employees, and measures the effectiveness of employee recruitment, compensation, and training. The Interactive Session on Organizations describes more of these benefits in detail.

9-2 How do supply chain management systems coordinate planning, production, and logistics with suppliers?

If you manage a small firm that makes a few products or sells a few services, chances are you will have a small number of suppliers. You could coordinate your supplier orders and deliveries by using just a telephone and a fax machine. But if you manage a firm that produces more complex products and services, you will have hundreds of suppliers, and each of your suppliers will have its own set of suppliers. Suddenly, you will need to coordinate the activities of hundreds or even thousands of other firms to produce your products and services. Supply chain management (SCM) systems, one of the enterprise applications introduced in Chapter 2, are an answer to the problems of supply chain complexity and scale.

THE SUPPLY CHAIN

A firm's **supply chain** is a network of organizations and business processes for procuring raw materials, transforming these materials into intermediate and finished products, and distributing the finished products to customers. It links suppliers, manufacturing plants, distribution centers, retail outlets, and customers to supply goods and services from source through consumption. Materials, information, and payments flow through the supply chain in both directions.

Goods start out as raw materials and, as they move through the supply chain, are transformed into intermediate products (also referred to as components or parts) and, finally, into finished products. The finished products are shipped to distribution centers and from there to retailers and customers. Returned items flow in the reverse direction from the buyer back to the seller.

Let's look at the supply chain for Nike sneakers as an example. Nike designs, markets, and sells sneakers, socks, athletic clothing, and accessories throughout the world. Its primary suppliers are contract manufacturers with factories in China, Thailand, Indonesia, Brazil, and other countries. These companies fashion Nike's finished products.

Nike's contract suppliers do not manufacture sneakers from scratch. They obtain components for the sneakers—the laces, eyelets, uppers, and soles—from other suppliers and then assemble them into finished sneakers. These suppliers in turn have their own suppliers. For example, the suppliers of soles have suppliers for synthetic rubber, suppliers for chemicals used to melt the rubber for molding, and suppliers for the molds into which to pour the rubber. Suppliers of laces have suppliers for their thread, for dyes, and for the plastic lace tips.

Soma Bay is a 10-million-square-mile resort community on the Egyptian shore of the Red Sea. It has many attractions that make it a first-class vacation paradise, including five hotels, a championship golf course, water sport facilities, a world-class spa, and luxury vacation homes. Soma Bay Development Company is headquartered in Hurghada, Egypt, and has more than 2,000 employees.

Unfortunately, political upheavals and economic conditions have taken a toll on occupancy rates and profitability. When President Hosni Mubarak was overthrown during the Egyptian revolution of 2011, there was a sharp devaluation of Egyptian currency. In the years that followed, political conditions stabilized and the Egyptian economy recovered, but the tourism industry lost US \$1.3 billion after the downing of a commercial airliner over the Sinai Desert in late 2015. Soma Bay Development Company's hotel occupancy rates plummeted from more than 50 percent in 2015 to 25 percent in the first quarter of 2016.

Foreign exchange fluctuations and political upheavals are forces beyond Soma Bay's control, but what the company's management can do during downturns is react intelligently by closely monitoring operations and costs. This is possible thanks to the company's use of a JD Edwards Enterprise One ERP system from Oracle with applications and data residing in Oracle's Cloud Infrastructure as a Service (Oracle Cloud IaaS).

In the past, Soma Bay Development Company had tried to run much of the company using unwieldy Excel-based systems. Managers had to manually manipulate spreadsheets to understand the basic drivers of profitability, and it often took too long to obtain the information needed for sound decision making. These systems made it difficult for Soma Bay to manage its aggressive growth plans, which included construction of 1,000 new homes over a five-year period.

Mohammed Serry, Soma Bay Company's CFO, and his team selected JD Edwards Enterprise One for a solution because it could create standardized business processes across functional areas and provide timely reports that explain the profitability of each business unit using a standard chart of accounts. The software can identify the profitability drivers and growth drivers of a business. Enterprise One seamlessly combines data from the general ledger and other financial systems with data from operational systems.

Soma Bay's Enterprise One cloud platform makes it easy to create cash flow reports, project management reports, accounts receivable aging reports, facility management reports, and key performance indicator reports throughout Soma Bay's distributed organization. Company management also appreciates Oracle Cloud IaaS disaster recovery capabilities. Several years ago, water from an upper floor flooded Soma Bay's Cairo data center. The company was able to restore data and resume operations quickly because it had backups stored in Oracle Cloud.

JD Edwards Enterprise One contains more than 80 separate application modules designed to support a wide range of business processes. The software suite also features mobile applications that support both iOS and Android and can be used on smartphones and tablets. Soma Bay uses the JD Edwards Enterprise One modules for Financials, Procurement, Inventory Management, Job Cost, Real Estate Management, Homebuilder Management, Capital Asset Maintenance, Service Management, and Time and Labor. JD Edwards Enterprise One Homebuilder Management helps Soma Bay coordinate activities and analyze profitability throughout its home-building cycle down to the lot level. JD Edwards Enterprise One Real Estate Management streamlines financial, operational, and facilities management processes for finished properties, coordinating tasks among teams and providing a comprehensive management view of each unit. The Job Cost module shows ongoing costs for the real estate business, which helps management allocate expenses for materials, labor, and other needs and also track expenses against the budgets and forecasts established at the outset of each facilities management project. Managers can identify projects with codes and merge them with financial account numbers to determine budget expenses versus actual expenses. They can thereby verify if complex projects are on track and share expense data among divisions.

The Enterprise One software creates currency-neutral financial reports. This helps reconcile revenue from Soma Bay's tourism division (which caters to Germany and other parts of Europe) with its home sales division (which is aimed primarily at Egyptians) to neutralize the effect of different currencies on financial results. Home building accounts for about 25 percent of corporate revenue.

Having a dual revenue stream mitigates risks. If the tourism business is slow, Soma Bay still has revenue from the real estate business, and vice versa. The ERP system provides the data required to closely track costs. For example, in 2017 Soma Bay spent 100 million Egyptian pounds (equivalent to approximately US \$5.7 million) on new construction. The Enterprise One system provided the information about cash management and cash flow for sustaining this level of expansion. Soma Bay can carefully monitor cash flow and payments to contractors.

During the 2016 downturn, Soma Bay used the Enterprise One cost management and profitability capabilities to provide detailed financial data that helped managers carefully control fixed operating expenses, helping to minimize losses. Enterprise One provided a solid understanding of costs and profitability, even though revenue came from different currencies and markets. It was able

to show the impact of falling occupancy rates on the business, excluding foreign exchange effect, to help management measure overall performance by legal entity. This knowledge helped Soma Bay weather the downturn and implement an aggressive turnaround plan.

Today, 95 percent of Soma Bay staff members use the Enterprise One software in some capacity. The company has a more stable operating model. Occupancy rates at its five hotels are rising. Soma Bay Development Company is building 500 vacation homes in six seaside communities. According to Cherif Samir, Financial Controller for Soma Bay, being able to track every penny the company spends on a project has revolutionized the business.

Sources: www.searchoracle.com, accessed January 30, 2019; David Baum, "Destination: Cloud," *Profit Magazine*, Fall 2017; "Destination Cloud: How Oracle IaaS Has Shaped Soma Bay," *Queset Oracle Community*, June 27, 2019; and www.somabay.com, accessed January 31, 2019.

CASE STUDY QUESTIONS

1. Identify and describe the problem discussed in this case. What people, organization, and technology factors contributed to the problem?
2. Why was an ERP system required for a solution? How did having a cloud-based ERP system contribute to the solution?
3. What were the business benefits of Soma Bay's new enterprise system? How did it change decision making and the way the company operated?

Figure 9.2 provides a simplified illustration of Nike's supply chain for sneakers; it shows the flow of information and materials among suppliers, Nike, Nike's distributors, retailers, and customers. Nike's contract manufacturers are its primary suppliers. The suppliers of soles, eyelets, uppers, and laces are the secondary (Tier 2) suppliers. Suppliers to these suppliers are the tertiary (Tier 3) suppliers.

The *upstream* portion of the supply chain includes the company's suppliers, the suppliers' suppliers, and the processes for managing relationships with them. The *downstream* portion consists of the organizations and processes for distributing and delivering products to the final customers. Companies that manufacture, such as Nike's contract suppliers of sneakers, also manage their own *internal supply chain processes* for transforming materials, components, and services their suppliers furnish into finished products or intermediate products (components or parts) for their customers and for managing materials and inventory.

The supply chain illustrated in Figure 9.2 has been simplified. It shows only two contract manufacturers for sneakers and only the upstream supply chain for sneaker soles. Nike has hundreds of contract manufacturers turning out finished sneakers, socks, and athletic clothing, each with its own set of suppliers. The upstream portion of Nike's supply chain actually comprises thousands of entities. Nike also has numerous distributors and many thousands of retail stores where its shoes are sold, so the downstream portion of its supply chain also is large and complex.

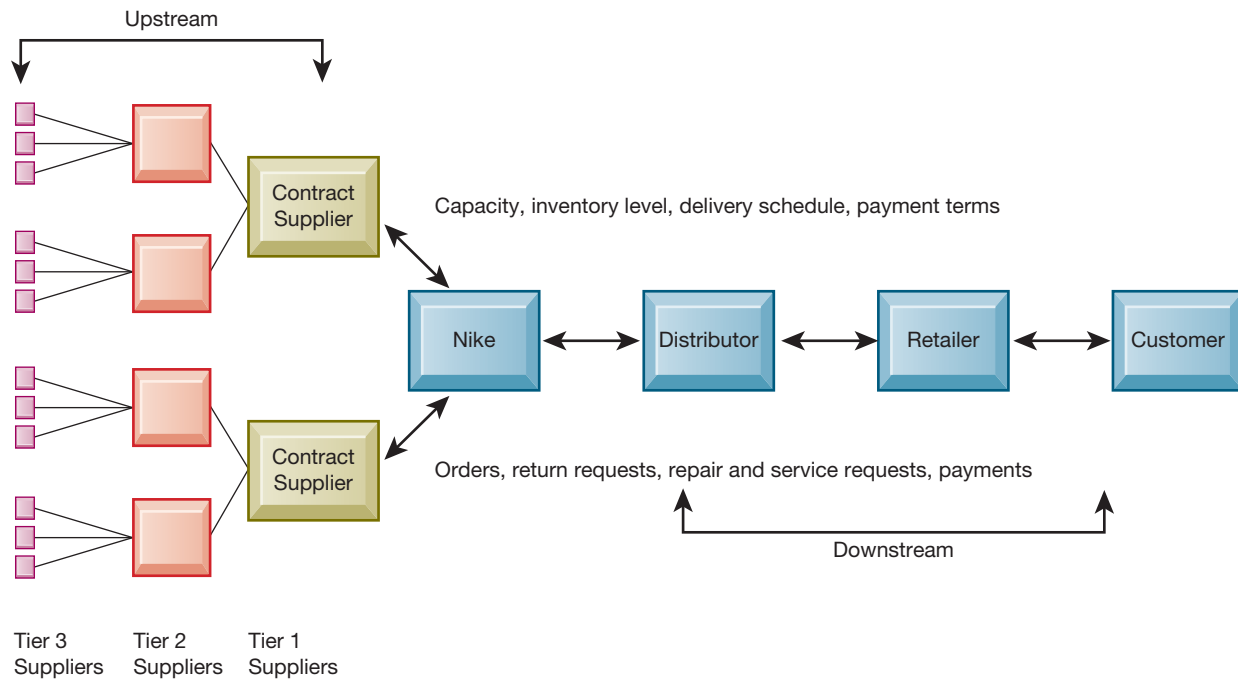


Figure 9.2
Nike's Supply Chain.

This figure illustrates the major entities in Nike's supply chain and the flow of information upstream and downstream to coordinate the activities involved in buying, making, and moving a product. Shown here is a simplified supply chain, with the upstream portion focusing only on the suppliers for sneakers and sneaker soles.

INFORMATION SYSTEMS AND SUPPLY CHAIN MANAGEMENT

Inefficiencies in the supply chain, such as parts shortages, underused plant capacity, excessive finished goods inventory, or high transportation costs, are caused by inaccurate or untimely information. For example, manufacturers may keep too many parts in inventory because they do not know exactly when they will receive their next shipments from their suppliers. Suppliers may order too few raw materials because they do not have precise information on demand. These supply chain inefficiencies waste as much as 25 percent of a company's operating costs.

If a manufacturer had perfect information about exactly how many units of product customers wanted, when they wanted them, and when they could be produced, it would be possible to implement a highly efficient **just-in-time strategy**. Components would arrive exactly at the moment they were needed, and finished goods would be shipped as they left the assembly line.

In a supply chain, however, uncertainties arise because many events cannot be foreseen—uncertain product demand, late shipments from suppliers, defective parts or raw materials, or production process breakdowns. To satisfy customers, manufacturers often deal with such uncertainties and unforeseen events by keeping more material or products in inventory than they think they may actually need. The *safety stock* acts as a buffer for the lack of flexibility in the supply chain. Although excess inventory is expensive, low fill rates are also costly because business may be lost from canceled orders.

One recurring problem in supply chain management is the **bullwhip effect**, in which information about the demand for a product gets distorted as it passes from one entity to the next across the supply chain. A slight rise in demand for an item might cause different members in the supply chain—distributors, manufacturers, suppliers, secondary suppliers (suppliers' suppliers), and tertiary suppliers (suppliers' suppliers' suppliers)—to stockpile inventory so each has enough just in case. These changes ripple throughout the supply chain, magnifying what started out as a small

existing supply chain, generate demand forecasts for products, and develop optimal sourcing and manufacturing plans. Such systems help companies make better decisions, such as determining how much of a specific product to manufacture in a given time period; establishing inventory levels for raw materials, intermediate products, and finished goods; determining where to store finished goods; and identifying the transportation mode to use for product delivery.

For example, if a large customer places a larger order than usual or changes that order on short notice, it can have a widespread impact throughout the supply chain. Additional raw materials or a different mix of raw materials may need to be ordered from suppliers. Manufacturing may have to change job scheduling. A transportation carrier may have to reschedule deliveries. Supply chain planning software makes the necessary adjustments to production and distribution plans. Information about changes is shared among the relevant supply chain members so that their work can be coordinated. One of the most important—and complex—supply chain planning functions is **demand planning**, which determines how much product a business needs to make to satisfy all its customers' demands. JDA Software, SAP, and Oracle all offer supply chain management solutions.

Supply chain execution systems manage the flow of products through distribution centers and warehouses to ensure that products are delivered to the right locations in the most efficient manner. They track the physical status of goods, the management of materials, warehouse and transportation operations, and financial information involving all parties. An example is the Warehouse Management System (WMS) that Haworth Incorporated uses. Haworth is a world-leading manufacturer and designer of office furniture. The WMS tracks and controls the flow of finished goods from Haworth's distribution centers to its customers. Acting on shipping plans for customer orders, the WMS directs the movement of goods based on immediate conditions for space, equipment, inventory, and personnel.

GLOBAL SUPPLY CHAINS AND THE INTERNET

Before the Internet, supply chain coordination was hampered by the difficulties of making information flow smoothly among disparate internal supply chain systems for purchasing, materials management, manufacturing, and distribution. It was also difficult to share information with external supply chain partners because the systems of suppliers, distributors, or logistics providers were based on incompatible technology platforms and standards. Enterprise and supply chain management systems enhanced with Internet technology supply some of this integration.

A manager uses a web interface to tap into suppliers' systems to determine whether inventory and production capabilities match demand for the firm's products. Business partners use web-based supply chain management tools to collaborate online on forecasts. Sales representatives access suppliers' production schedules and logistics information to monitor customers' order status.

Global Supply Chain Issues

More and more companies are entering international markets, outsourcing manufacturing operations, and obtaining supplies from other countries as well as selling abroad. Their supply chains extend across multiple countries and regions. There are additional complexities and challenges to managing a global supply chain.

Global supply chains typically span greater geographic distances and time differences than domestic supply chains and have participants from a number of countries. Performance standards may vary from region to region or from nation to nation. Supply chain management may need to reflect foreign government regulations and cultural differences.

The Internet helps companies manage many aspects of their global supply chains, including sourcing, transportation, communications, and international finance. Today's apparel industry, for example, relies heavily on outsourcing to contract

manufacturers in China and other low-wage countries. Apparel companies are starting to use the web to manage their global supply chain and production issues. (Review the discussion of Li & Fung in Chapter 3.)

In addition to contract manufacturing, globalization has encouraged outsourcing warehouse management, transportation management, and related operations to third-party logistics providers, such as UPS Supply Chain Solutions and DHL, the global delivery service. These logistics services offer web-based software to give their customers a better view of their global supply chains. Customers can check a secure website to monitor inventory and shipments, helping them run their global supply chains more efficiently.

Demand-Driven Supply Chains: from Push to Pull Manufacturing and Efficient Customer Response

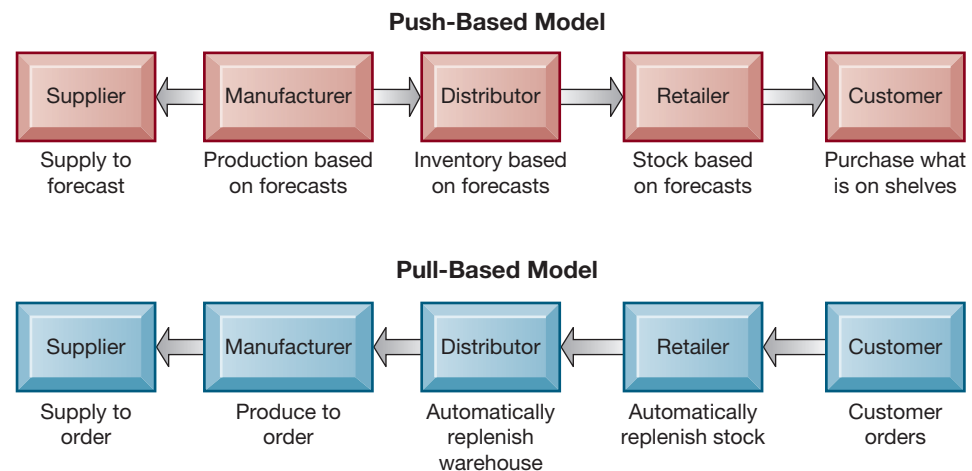
In addition to reducing costs, supply chain management systems facilitate efficient customer response, enabling the workings of the business to be driven more by customer demand. (We introduced efficient customer response systems in Chapter 3.)

Earlier supply chain management systems were driven by a push-based model (also known as build-to-stock). In a **push-based model**, production master schedules are based on forecasts or best guesses of demand for products, and products are pushed to customers. With new flows of information made possible by web-based tools, supply chain management more easily follows a pull-based model. In a **pull-based model**, also known as a demand-driven or build-to-order model, actual customer orders or purchases trigger events in the supply chain. Transactions to produce and deliver only what customers have ordered move up the supply chain from retailers to distributors to manufacturers and eventually to suppliers. Only products to fulfill these orders move back down the supply chain to the retailer. Manufacturers use only actual order demand information to drive their production schedules and the procurement of components or raw materials, as illustrated in Figure 9.4. Walmart's continuous replenishment system described in Chapter 3 is an example of the pull-based model.

The Internet and Internet technology make it possible to move from sequential supply chains, where information and materials flow sequentially from company to company, to concurrent supply chains, where information flows in many directions simultaneously among members of a supply chain network. Complex supply networks of manufacturers, logistics suppliers, outsourced manufacturers, retailers, and distributors can adjust immediately to changes in schedules or orders. Ultimately, the Internet will enable a digital logistics nervous system for supply chains (see Figure 9.5).

Figure 9.4
Push- Versus Pull-
Based Supply Chain
Models.

The difference between push- and pull-based models is summarized by the slogan "Make what we sell, not sell what we make."



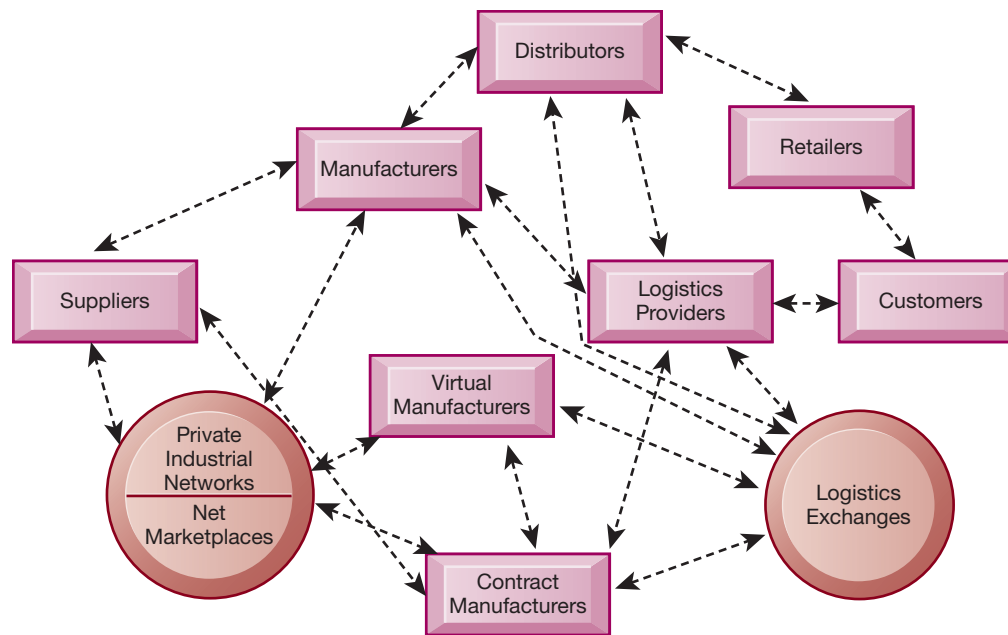


Figure 9.5
The Emerging
Internet-Driven Supply
Chain.

The emerging Internet-driven supply chain operates like a digital logistics nervous system. It provides multidirectional communication among firms, networks of firms, and e-marketplaces so that entire networks of supply chain partners can immediately adjust inventories, orders, and capacities.

BUSINESS VALUE OF SUPPLY CHAIN MANAGEMENT SYSTEMS

You have just seen how supply chain management systems enable firms to streamline both their internal and external supply chain processes and provide management with more accurate information about what to produce, store, and move. By implementing a networked and integrated supply chain management system, companies match supply to demand, reduce inventory levels, improve delivery service, speed product time to market, and use assets more effectively.

Total supply chain costs represent the majority of operating expenses for many businesses and in some industries approach 75 percent of the total operating budget. Reducing supply chain costs has a major impact on firm profitability.

In addition to reducing costs, supply chain management systems help increase sales. If a product is not available when a customer wants it, customers often try to purchase it from someone else. More precise control of the supply chain enhances the firm's ability to have the right product available for customer purchases at the right time.

9-3 How do customer relationship management systems help firms achieve customer intimacy?

You've probably heard phrases such as "the customer is always right" or "the customer comes first." Today these words ring truer than ever. Because competitive advantage based on an innovative new product or service is often very short lived, companies are realizing that their most enduring competitive strength may be their relationships with their customers. Some say that the basis of competition has switched from who sells the most products and services to who "owns" the customer and that customer relationships represent a firm's most valuable asset.

WHAT IS CUSTOMER RELATIONSHIP MANAGEMENT?

What kinds of information would you need to build and nurture strong, long-lasting relationships with customers? You'd want to know exactly who your customers are, how to contact them, whether they are costly to service and sell to, what kinds of

products and services they are interested in, and how much money they spend on your company. If you could, you'd want to make sure you knew each of your customers well, as if you were running a small-town store. And you'd want to make your good customers feel special.

In a small business operating in a neighborhood, it is possible for business owners and managers to know their customers well on a personal, face-to-face basis, but in a large business operating on a metropolitan, regional, national, or even global basis, it is impossible to know your customer in this intimate way. There are too many customers and too many ways that customers interact with the firm (over the web, the phone, email, blogs, and in person). It becomes especially difficult to integrate information from all these sources, since a large firm's processes for sales, service, and marketing tend to be highly compartmentalized. Some information on a specific customer might be stored and organized in terms of that person's account with the company. Other pieces of information about the same customer might be organized by products that were purchased. In this traditional business environment, there is no convenient way to consolidate all this information to provide a unified view of a customer across the company.

This is where customer relationship management systems help. Customer relationship management (CRM) systems, one of the enterprise applications introduced in Chapter 2, capture and integrate customer data from all over the organization, consolidate the data, analyze the data, and then distribute the results to various systems and customer touch points across the enterprise. A **touch point** (also known as a contact point) is a method of interaction with the customer, such as telephone, email, customer service desk, conventional mail, Facebook, Twitter, website, wireless device, or retail store. Well-designed CRM systems provide a single enterprise view of customers that is useful for improving both sales and customer service (see Figure 9.6).

Good CRM systems provide data and analytical tools for answering questions such as these: What is the value of a particular customer to the firm over his or her lifetime? Who are our most loyal customers? Who are our most profitable customers? What do these profitable customers want to buy? Firms use the answers to these questions to acquire new customers, provide better service and support to existing customers, customize their offerings more precisely to customer preferences, and provide ongoing value to retain profitable customers.

Figure 9.6
Customer Relationship Management (CRM).

CRM systems examine customers from a multifaceted perspective. These systems use a set of integrated applications to address all aspects of the customer relationship, including customer service, sales, and marketing.



CUSTOMER RELATIONSHIP MANAGEMENT SOFTWARE

Commercial CRM software packages range from niche tools that perform limited functions, such as personalizing websites for specific customers, to large-scale enterprise applications that capture myriad interactions with customers, analyze them with sophisticated reporting tools, and link to other major enterprise applications, such as supply chain management and enterprise systems. The more comprehensive CRM packages contain modules for **partner relationship management (PRM)** and **employee relationship management (ERM)**.

PRM uses many of the same data, tools, and systems as customer relationship management to enhance collaboration between a company and its selling partners. If a company does not sell directly to customers but rather works through distributors or retailers, PRM helps these channels sell to customers directly. It provides a company and its selling partners with the ability to trade information and distribute leads and data about customers, integrating lead generation, pricing, promotions, order configurations, and availability. It also provides a firm with tools to assess its partners' performances so it can make sure its best partners receive the support they need to close more business.

ERM software deals with employee issues that are closely related to CRM, such as setting objectives, employee performance management, performance-based compensation, and employee training. Major CRM application software vendors include Oracle, SAP, Salesforce.com, and Microsoft Dynamics CRM.

Customer relationship management systems typically provide software and online tools for sales, customer service, and marketing. We briefly describe some of these capabilities.

Sales Force Automation

Sales force automation (SFA) modules in CRM systems help sales staff increase productivity by focusing sales efforts on the most profitable customers, those who are good candidates for sales and services. SFA modules provide sales prospect and contact information, product information, product configuration capabilities, and sales quote generation capabilities. Such software can assemble information about a particular customer's past purchases to help the salesperson make personalized recommendations. SFA modules enable sales, marketing, and shipping departments to share customer and prospect information easily. SFA increases each salesperson's efficiency by reducing the cost per sale as well as the cost of acquiring new customers and retaining old ones. SFA modules also provide capabilities for sales forecasting, territory management, and team selling.

Customer Service

Customer service modules in CRM systems provide information and tools to increase the efficiency of call centers, help desks, and customer support staff. They have capabilities for assigning and managing customer service requests.

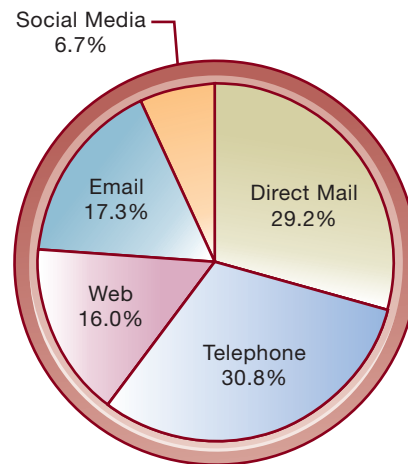
One such capability is an appointment or advice telephone line. When a customer calls a standard phone number, the system routes the call to the correct service person, who inputs information about that customer into the system only once. When the customer's data are in the system, any service representative can handle the customer relationship. Improved access to consistent and accurate customer information helps call centers handle more calls per day and decrease the duration of each call. Thus, call centers and customer service groups achieve greater productivity, reduced transaction time, and higher quality of service at lower cost. The customer is happier because he or she spends less time on the phone restating his or her problem to customer service representatives.

CRM systems may also include web-based self-service capabilities: The company website can be set up to provide inquiring customers personalized support information as well as the option to contact customer service staff by phone for additional assistance.

Figure 9.7
How CRM Systems
Support Marketing.

Customer relationship management software provides a single point for users to manage and evaluate marketing campaigns across multiple channels, including email, direct mail, telephone, the web, and social media.

**Responses by Channel for January 2020
Promotional Campaign**



Marketing

CRM systems support direct-marketing campaigns by providing capabilities for capturing prospect and customer data, for providing product and service information, for qualifying leads for targeted marketing, and for scheduling and tracking direct-marketing mailings or email (see Figure 9.7). Marketing modules also include tools for analyzing marketing and customer data, identifying profitable and unprofitable customers, designing products and services to satisfy specific customer needs and interests, and identifying opportunities for cross-selling.

Cross-selling is the marketing of complementary products to customers. (For example, in financial services, a customer with a checking account might be sold a money market account or a home improvement loan.) CRM tools also help firms manage and execute marketing campaigns at all stages, from planning to determining the rate of success for each campaign.

Figure 9.8 illustrates the most important capabilities for sales, service, and marketing processes found in major CRM software products. Like enterprise software, this software is business-process driven, incorporating hundreds of business processes thought to represent best practices in each of these areas. To achieve maximum benefit, companies need to revise and model their business processes to conform to the best-practice business processes in the CRM software.

Figure 9.9 illustrates how a best practice for increasing customer loyalty through customer service might be modeled by CRM software. Directly servicing customers provides firms with opportunities to increase customer retention by singling out profitable long-term customers for preferential treatment. CRM software can assign each customer a score based on that person's value and loyalty to the company and provide that information to help call centers route each customer's service request to agents who can best handle that customer's needs. The system would automatically provide the service agent with a detailed profile of that customer that includes his or her score for value and loyalty. The service agent would use this information to present special offers or additional services to the customer to encourage the customer to keep transacting business with the company. You will find more information on other best-practice business processes in CRM systems in our Learning Tracks.

OPERATIONAL AND ANALYTICAL CRM

All of the applications we have just described support either the operational or analytical aspects of customer relationship management. **Operational CRM** includes customer-facing applications, such as tools for sales force automation, call center

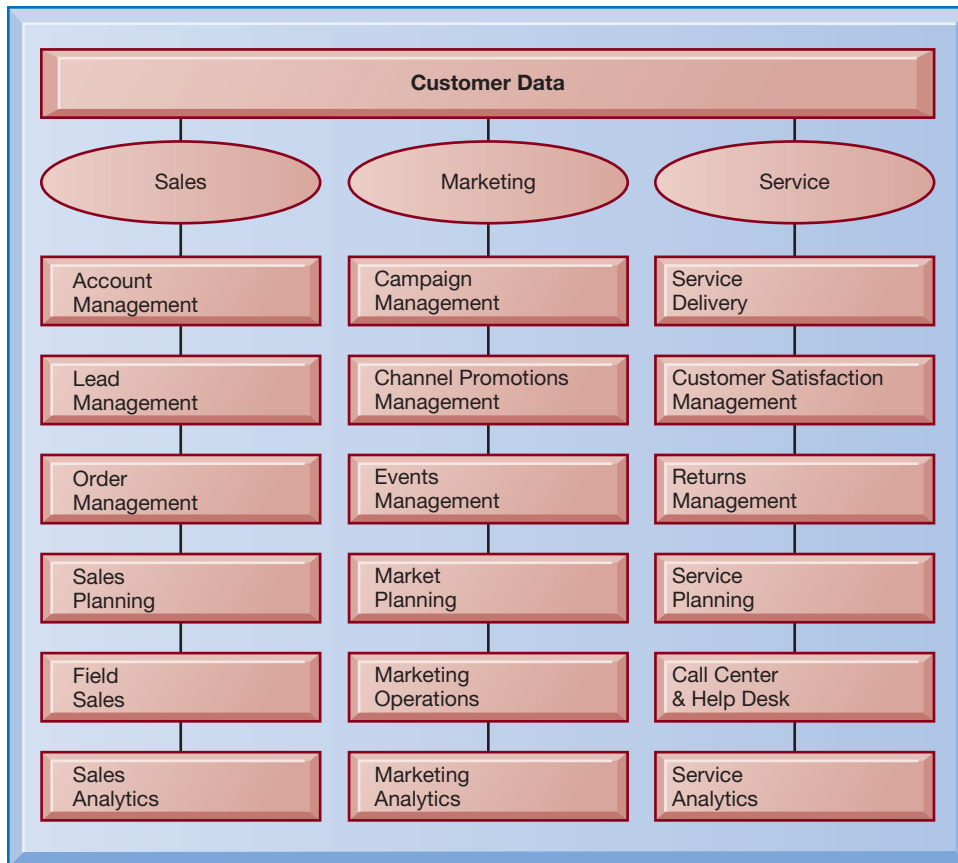


Figure 9.8
CRM Software Capabilities.

The major CRM software products support business processes in sales, service, and marketing, integrating customer information from many sources. Included is support for both the operational and analytical aspects of CRM.

and customer service support, and marketing automation. **Analytical CRM** includes applications that analyze customer data generated by operational CRM applications to provide information for improving business performance.

Analytical CRM applications are based on data from operational CRM systems, customer touch points, and other sources that have been organized in data warehouses or analytic platforms for use in online analytical processing (OLAP),

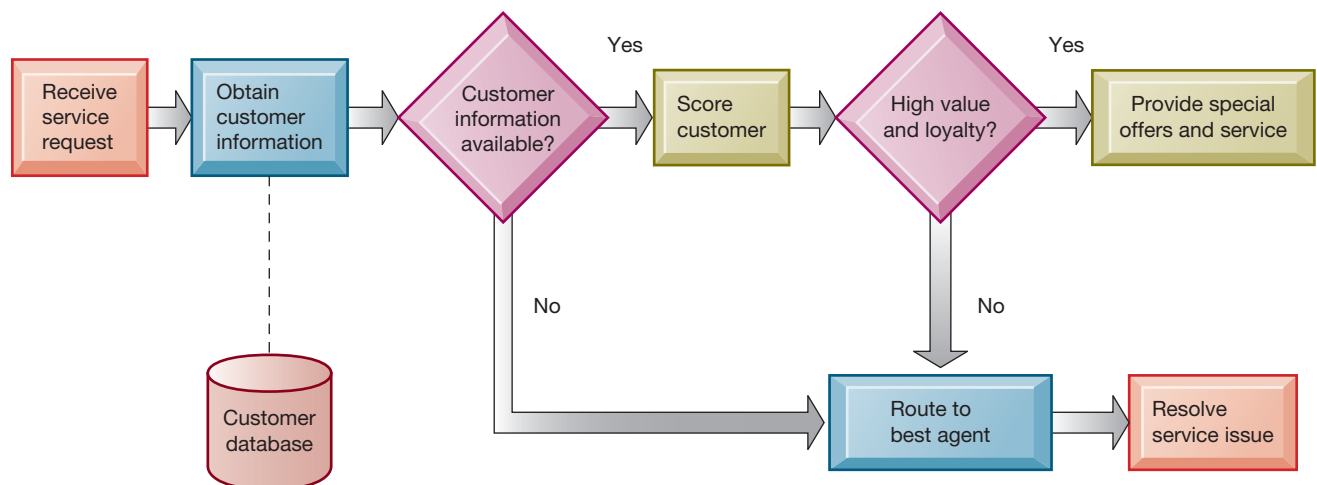
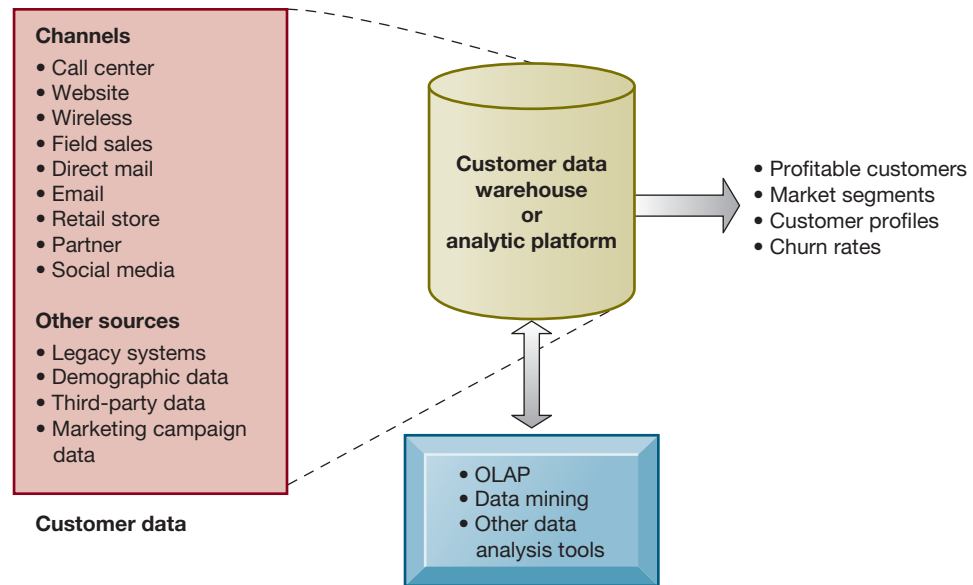


Figure 9.9
Customer Loyalty Management Process Map.

This process map shows how a best practice for promoting customer loyalty through customer service would be modeled by customer relationship management software. The CRM software helps firms identify high-value customers for preferential treatment.

Figure 9.10**Analytical CRM.**

Analytical CRM uses a customer data warehouse or analytic platform and tools to analyze customer data collected from the firm's customer touch points and from other sources.



data mining, and other data analysis techniques (see Chapter 6). Customer data collected by the organization might be combined with data from other sources, such as customer lists for direct-marketing campaigns purchased from other companies or demographic data. Such data are analyzed to identify buying patterns, to create segments for targeted marketing, and to pinpoint profitable and unprofitable customers (see Figure 9.10).

Another important output of analytical CRM is the customer's lifetime value to the firm. **Customer lifetime value (CLTV)** is based on the relationship between the revenue produced by a specific customer, the expenses incurred in acquiring and servicing that customer, and the expected life of the relationship between the customer and the company.

BUSINESS VALUE OF CUSTOMER RELATIONSHIP MANAGEMENT SYSTEMS

Companies with effective customer relationship management systems realize many benefits, including increased customer satisfaction, reduced direct-marketing costs, more effective marketing, and lower costs for customer acquisition and retention. Information from CRM systems increases sales revenue by identifying the most profitable customers and segments for focused marketing and cross-selling (see the Interactive Session on People).

Customer churn is reduced as sales, service, and marketing respond better to customer needs. The **churn rate** measures the number of customers who stop using or purchasing products or services from a company. It is an important indicator of the growth or decline of a firm's customer base.

Adidas is a leading global maker of athletic shoes, clothing, and accessories, selling 1.2 million pairs of shoes each day. The company is headquartered in Herzogenaurach, Germany, has about 60,000 employees worldwide, and produced net sales of 21.9 billion euros (US\$24.9 billion) in 2018. It is the second largest sportswear manufacturer in the world after Nike.

Adidas is also a leader in digital and online marketing. The company's most important store is no longer a physical store—it's a website. The Adidas website is a key channel for offering connected and personalized customer experiences that help differentiate Adidas from competitors and lead to increased sales. E-commerce is Adidas's most profitable point-of-sale channel, with online sales expected to reach 4 billion euros (US\$4.5 billion) by 2020.

Adidas does not compete on price but on the quality of its brand and the customer experience. The transition from brick-and-mortar to digital as the preferred shopping medium has shaped the way the company keeps up with changing customer preferences. Customers are clearly at the center of Adidas's business, and their experience with other online retailers such as Amazon has made them want a relationship with Adidas that is more personal.

To serve customers better and manage all of its relationships with them, Adidas turned to Salesforce.com, which features cloud-based tools for customer relationship management (CRM) and application development. Salesforce.com helps Adidas identify key customer segments, develop closer ties to customers, and design differentiated experiences tailored to each customer's needs. Salesforce CRM tools make it possible for Adidas to have a single view of each customer across all the various channels through which that person interacts with the company.

Salesforce Marketing Cloud is a CRM platform that allows marketers to create and manage marketing relationships and campaigns with customers. The Marketing Cloud incorporates integrated solutions for customer journey management, email, mobile, social media, web personalization, advertising, content creation, content management, and data analysis. Every imaginable customer interaction and engagement is covered. The software includes predictive analytics

to help make decisions such as, for example, what channel would be preferable for a given message. A component called Journey Builder helps marketers tailor campaigns to customers' behavior and needs, demographics, and communication channel preferences.

The Marketing Cloud is connected to Salesforce.com's Sales Cloud and Service Cloud to provide a unified experience and prevent customers from being contacted separately by representatives from sales, marketing, and service groups. Service Cloud is a platform for customer service and support. Companies using Service Cloud can automate service processes, streamline workflows, and locate key articles, topics, and experts with information to help the company's 1,100 customer service agents. Service Cloud can "listen" and respond to customers across a variety of social platforms and automatically route cases to the appropriate agent. Service for Apps makes it possible to embed customer support software into mobile applications, including features for live agent video chat, screen sharing, and on-screen guided assistance. Service Cloud makes it possible to deliver service that is more personalized and convenient in whatever form each customer prefers—email, web, social media, or telephone—all from a single application.

Adidas is able to deploy its centralized e-commerce site globally by using the Salesforce Commerce Cloud. Commerce Cloud supports every language and currency required for the company's business throughout the globe. Adidas uses the knowledge of individual customers and their preferences obtained through Commerce Cloud to create better products, which can be manufactured and delivered to the customer very rapidly. Adidas is also using the Salesforce DMP data management platform to capture online and web behavior from digital actions across all channels and devices.

To move even closer to the customer, Adidas developed a mobile app that customizes content, interactions, and products based on the customer's personal preferences and behavior that have been identified via various digital points of engagement. The app features customized product recommendations, color preference and location, order tracking, blog posts, personalized articles, videos, real-time updates concerning an individual's sport and sports star preferences, and an intelligent

online chat tool called Einstein to help answer customer questions and make more customized product recommendations. The app works with Apple Pay and Android Pay mobile payment systems.

Jacqueline Smith-Dubendorfer, Adidas Vice President of Digital Experience Design, believes that using Salesforce for customer relationship management has enhanced the company's ability to treat each customer as an individual. Who is this person? How much do we know about that individual? Where did that person come from? What is that person interested in? With Salesforce CRM tools, Adidas can now answer these questions

much more easily. CRM provides the information for Adidas to adapt what it presents to the customer to deliver as close as it can to what the customer is actually looking for. Adidas can now connect one-to-one with every customer, across multiple channels and on any device.

Sources: "Adidas," www.salesforce.com, accessed January 11, 2019; "Fact Sheet 2018," www.adidas-group.com, accessed March 20, 2019; Stuart Lauchlan, "Dreamforce 2018—Adidas Gets Closer to Customers by Adopting an Athletic Mindset in Business," *Diginomica*, September 27, 2018; and Nadia Cameron, "Adidas Taps Data and Technology Smarts to Build Personalized Digital Engagement with Customers," *CMO*, November 7, 2017.

CASE STUDY QUESTIONS

1. Analyze Adidas using the competitive forces and value chain model.
2. What is Adidas's business strategy? What is the role of customer relationship management in that strategy?
3. How do information systems support Adidas's strategy?
4. How did using Salesforce.com make Adidas more competitive? How did it change the way the company ran its business?
5. Give an example of two business decisions that were improved by using Salesforce.com.

9-4 What are the challenges that enterprise applications pose, and how are enterprise applications taking advantage of new technologies?

Many firms have implemented enterprise systems and systems for supply chain and customer relationship management because they are such powerful instruments for achieving operational excellence and enhancing decision making. But precisely because these enterprise applications are so powerful in changing the way the organization works, they are challenging to implement. Let's briefly examine some of these challenges as well as new ways of obtaining value from these systems.

ENTERPRISE APPLICATION CHALLENGES

Promises of dramatic reductions in inventory costs, order-to-delivery time, more efficient customer response, and higher product and customer profitability make enterprise systems and systems for SCM and CRM very alluring. But to obtain this value, you must clearly understand how your business has to change to use these systems effectively.

Enterprise applications involve complex pieces of software that are expensive to purchase and implement. According to a 2019 survey of 241 ERP users conducted by Panorama Consulting Solutions, 45 percent of ERP projects experienced cost overruns, and these overruns averaged 24 percent over budget. Fifty-eight percent exceeded their initial timelines (Panorama Consulting Solutions, 2019a). Changes in project scope and additional customization work add to implementation delays and costs.

Enterprise applications require not only deep-seated technological changes but also fundamental changes in the way the business operates. Companies must make

sweeping changes to their business processes to work with the software. Employees must accept new job functions and responsibilities. They must learn how to perform a new set of work activities and understand how the information they enter into the system can affect other parts of the company. This requires new organizational learning and should also be factored into ERP implementation costs.

SCM systems require multiple organizations to share information and business processes. Each participant in the system may have to change some of its processes and the way it uses information to create a system that best serves the supply chain as a whole.

Some firms experienced enormous operating problems and losses when they first implemented enterprise applications because they didn't understand how much organizational change was required. For example, a large European retailer had trouble getting products to store shelves when it first implemented i2 Technologies (now JDA Software) SCM software. The i2 software did not work well with the firm's promotion-driven business model, which created sharp spikes in demand for products. Supermarket giant Woolworth's Australia encountered data-related problems when it transitioned from an antiquated home-grown ERP system to SAP. Weekly profit-and-loss reports tailored for individual stores couldn't be generated for nearly 18 months. The company had to change its data collection procedures, but failed to understand its own processes or properly document these business processes.

Enterprise applications also introduce switching costs. When you adopt an enterprise application from a single vendor, such as SAP, Oracle, or others, it is very costly to switch vendors, and your firm becomes dependent on the vendor to upgrade its product and maintain your installation.

Enterprise applications are based on organization-wide definitions of data. You'll need to understand exactly how your business uses its data and how the data would be organized in a CRM, SCM, or ERP system. CRM systems typically require some data cleansing work.

Enterprise software vendors are addressing these problems by offering pared-down versions of their software and fast-start programs for small and medium-sized businesses and best-practice guidelines for larger companies. Companies are also achieving more flexibility by using cloud applications for functions not addressed by the basic enterprise software so that they are not constrained by a single do-it-all type of system.

Companies adopting enterprise applications can also save time and money by keeping customizations to a minimum. For example, a \$2 billion metal-cutting tools company in Germany had spent \$10 million over 13 years maintaining an ERP system with more than 6,400 customizations. The company replaced it with a plain-vanilla, uncustomized version of SAP enterprise software and changed its business processes to conform to the software. Office Depot avoided customization when it moved from in-house systems to the Oracle ERP Cloud. By not customizing its Oracle ERP applications, Office Depot simplified its information systems and reduced the cost of maintaining and managing them (Thibodeau, 2018).

NEXT-GENERATION ENTERPRISE APPLICATIONS

Today, enterprise application vendors are delivering more value by becoming more flexible, user-friendly, web-enabled, mobile, and capable of integration with other systems. Stand-alone enterprise systems, customer relationship management systems, and SCM systems are becoming a thing of the past. The major enterprise software vendors have created what they call *enterprise solutions*, *enterprise suites*, or e-business suites to make their CRM, SCM, and ERP systems work closely with each other and link to systems of customers and suppliers.

Next-generation enterprise applications also include cloud solutions as well as more functionality available on mobile platforms. Large enterprise software vendors such as SAP, Oracle, Microsoft, and Epicor now feature cloud versions of their flagship ERP systems and also cloud-based products for small and medium-sized businesses (as described earlier in the Interactive Session on Organizations). SAP,

for example, offers SAP S/4HANA Cloud for large companies, and SAP Business ByDesign and SAP Business One enterprise software for medium-sized and small businesses. Microsoft offers the Dynamics 365 cloud version of its ERP and CRM software. Cloud-based enterprise systems are also offered by smaller vendors such as NetSuite.

The undisputed global market leader in cloud-based CRM systems is Salesforce.com, which we described in Chapter 5. Salesforce.com delivers its service through Internet-connected computers or mobile devices, and it is widely used by small, medium-sized, and large enterprises. As cloud-based products mature, more companies, including large global firms, are choosing to run all or part of their enterprise applications in the cloud.

Social CRM

CRM software vendors are enhancing their products to take advantage of social networking technologies. These social enhancements help firms identify new ideas more rapidly, improve team productivity, and deepen interactions with customers (see Chapter 10). Using **social CRM** tools, businesses can better engage with their customers by, for example, analyzing their sentiments about their products and services.

Social CRM tools enable a business to connect customer conversations and relationships from social networking sites to CRM processes. The leading CRM vendors now offer such tools to link data from social networks to their CRM software. SAP, Salesforce.com, and Oracle CRM products now feature technology to monitor, track, and analyze social media activity on Facebook, LinkedIn, Twitter, YouTube, and other sites. Business intelligence and analytics software vendors such as SAS also have capabilities for social media analytics (with several measures of customer engagement across a variety of social networks) along with campaign management tools for testing and optimizing both social and traditional web-based campaigns.

Salesforce.com connected its system for tracking leads in the sales process with social-listening and social-media marketing tools, enabling users to tailor their social-marketing dollars to core customers and observe the resulting comments. If an ad agency wants to run a targeted Facebook or Twitter ad, these capabilities make it possible to aim the ad specifically at people in the client's lead pipeline who are already being tracked in the CRM system. Users will be able to view tweets as they take place in real time and perhaps uncover new leads. They can also manage multiple campaigns and compare them all to figure out which ones generate the highest click-through rates and cost per click.

Business Intelligence in Enterprise Applications

Enterprise application vendors have added business intelligence features to help managers obtain more meaningful information from the massive amounts of data these systems generate, including data from the Internet of Things (IoT). SAP now makes it possible for its enterprise applications to use HANA in-memory computing technology so that they are capable of much more rapid and complex data analysis. Included are tools for flexible reporting; ad hoc analysis; interactive dashboards; what-if scenario analysis; data visualization; and machine learning to analyze very large bodies of data, make connections, make predictions, and provide recommendations for operations optimization. For example, SAP created a machine learning and neural network application (see Chapter 11) that recognizes patterns associated with machine performance in the oil and gas industry. The software automatically generates notifications of potential machine failures and sends them to SAP Plant Maintenance, which planners use to schedule machine repair and replacement (Franken, 2018).

The major enterprise application vendors offer portions of their products that work on mobile handhelds. You can find out more about this topic in our Learning Track on Wireless Applications for Customer Relationship Management, Supply Chain Management, and Healthcare.

9-5 How will MIS help my career?



Here is how Chapter 9 and this book can help you find a job as a manufacturing management trainee.

THE COMPANY

Global Industrial Components is a large company with 40 global manufacturing facilities and more than 4,000 employees worldwide, and it has an open position for a new college graduate in its Manufacturing Management Program. The company produces fastener, engineered, and linkage and suspension components for automotive, heavy-duty trucks, aerospace, electric utility, telecommunications, and other industries worldwide.

POSITION DESCRIPTION

The Manufacturing Management Program is a rotational, two-year program designed to nurture and train future managers by enabling recent college graduates to acquire critical skills and industry experience in plant, technical, and corporate environments. Job responsibilities include:

- Working with business units and project teams on systems implementation, including implementation of ERP and JDA manufacturing systems.
- Understanding business processes and data requirements for each business unit.
- Proficiency in supporting and conducting business requirement analysis sessions.
- Tracking and documenting changes to functional and business specifications.
- Writing user documentation, instructions, and procedures.
- Monitoring and documenting post-implementation problems and revision requests.

JOB REQUIREMENTS

- Bachelor's degree in IT, MIS, engineering, or related field or equivalent, with a GPA higher than 3.0
- Demonstrated skills in Microsoft Office Suite
- Strong written and verbal communication skills
- Proven track record of accomplishments both inside and outside the educational setting
- Experience in a leadership role in a team

INTERVIEW QUESTIONS

- Describe the projects you have worked on in a team. Did you play a leadership role? Exactly what did you do to help your team achieve its goal? Were any of these projects IT projects?
- What do you know about ERP or JDA manufacturing systems? Have you ever worked with them? What exactly did you do with these systems?
- Tell us what you can do with Microsoft Office software. Which tools have you used? Do you have any Access and Excel skills? What kinds of problems have you used these tools to solve? Did you take courses in Access or Excel?

AUTHOR TIPS

1. Do some research on the company, its industry, and the kinds of challenges it faces. Look through the company's LinkedIn page and read their posts over the past 12 months. Are there any key trends in the LinkedIn posts for this company?

2. Review this text's Chapter 9 on enterprise applications, and Chapter 12 on developing systems, and IT project management and implementation.
3. View YouTube videos created by major IT consulting firms that discuss the latest trends in manufacturing technology and enterprise systems.
4. Inquire how you would be using Microsoft Office tools for the job and what Excel and Access skills you would be expected to demonstrate. Bring examples of the work you have done with this software. Show that you would be eager to learn what you don't know about these tools to fulfill your job assignments.
5. Bring examples of your writing demonstrating your analytical skills and project experience.

Review Summary

9-1 How do enterprise systems help businesses achieve operational excellence? Enterprise software is based on a suite of integrated software modules and a common central database. The database collects data from and feeds the data into numerous applications that can support nearly all of an organization's internal business activities. When one process enters new information, the information is made available immediately to other business processes.

Enterprise systems support organizational centralization by enforcing uniform data standards and business processes throughout the company and a single unified technology platform. The firmwide data that enterprise systems generate help managers evaluate organizational performance.

9-2 How do supply chain management systems coordinate planning, production, and logistics with suppliers? Supply chain management (SCM) systems automate the flow of information among members of the supply chain so they can use it to make better decisions about when and how much to purchase, produce, or ship. More accurate information from supply chain management systems reduces uncertainty and the impact of the bullwhip effect.

Supply chain management software includes software for supply chain planning and for supply chain execution. Internet technology facilitates the management of global supply chains by providing the connectivity for organizations in different countries to share supply chain information. Improved communication among supply chain members also facilitates efficient customer response and movement toward a demand-driven model.

9-3 How do customer relationship management systems help firms achieve customer intimacy? Customer relationship management (CRM) systems integrate and automate customer-facing processes in sales, marketing, and customer service, providing an enterprise-wide view of customers. Companies can use this customer knowledge when they interact with customers to provide them with better service or sell new products and services. These systems also identify profitable or unprofitable customers or opportunities to reduce the churn rate.

The major customer relationship management software packages provide capabilities for both operational CRM and analytical CRM. They often include modules for managing relationships with selling partners (partner relationship management) and for employee relationship management.

9-4 What are the challenges that enterprise applications pose, and how are enterprise applications taking advantage of new technologies? Enterprise applications are difficult to implement. They require extensive organizational change, large new software investments, and careful assessment of how these systems will enhance organizational performance. Enterprise applications cannot provide value if

they are implemented atop flawed processes or if firms do not know how to use these systems to measure performance improvements. Employees require training to prepare for new procedures and roles. Attention to data management is essential.

Enterprise applications are now more flexible, web-enabled, and capable of integration with other systems, using web services and service-oriented architecture (SOA). They also can run in cloud infrastructures or on mobile platforms. CRM software has added social networking capabilities to enhance internal collaboration, deepen interactions with customers, and use data from social networking sites. Enterprise applications are incorporating business intelligence capabilities for analyzing the large quantities of data they generate.

Key Terms

Analytical CRM, 351	Enterprise software, 338	Social CRM, 356
Bullwhip effect, 343	Just-in-time strategy, 343	Supply chain, 340
Churn rate, 352	Operational CRM, 350	Supply chain execution systems, 345
Cross-selling, 350	Partner relationship management (PRM), 349	Supply chain planning systems, 344
Customer lifetime value (CLTV), 352	Pull-based model, 346	Touch point, 348
Demand planning, 345	Push-based model, 346	
Employee relationship management (ERM), 349	Sales force automation (SFA), 349	

Review Questions

- 9-1** How do enterprise systems help businesses achieve operational excellence?
- Identify six financial and accounting processes supported by enterprise systems.
 - Explain how enterprise systems provide valuable information for improving management decision making.
- 9-2** How do supply chain management systems coordinate planning, production, and logistics with suppliers?
- List four likely parts of a retailer's supply chain.
 - Distinguish between upstream and downstream portions of the supply chain.
 - Identify the supply system likely to be used by a manufacturer with perfect information on future orders.
 - Identify one of the most important and complex aspects of supply chain planning.
 - Explain how supply chains costs can impact on an organization's profitability.
- 9-3** How do customer relationship management systems help firms achieve customer intimacy?
- Identify three potential touch points for a retailer and explain what a touch is.
 - Describe the nature and purpose of sales force automation.
 - Describe cross-selling and why it is important to a business.
 - Distinguish between operational and analytical CRM.
- 9-4** What are the challenges that enterprise applications pose, and how are enterprise applications taking advantage of new technologies?
- List and describe the challenges enterprise applications pose.
 - Explain how these challenges can be addressed.
 - Describe how enterprise applications are taking advantage of cloud computing and business intelligence.
 - Define social CRM and explain how customer relationship management systems are using social networking.

MyLab MIS™

To complete the problems with **MyLab MIS**, go to the EOC Discussion Questions in MyLab MIS.

Discussion Questions

- 9-5** Supply chain management is less
MyLab MIS about managing the physical movement of goods and more about managing information. Discuss the implications of this statement.
- 9-6** If a company wants to implement
MyLab MIS an enterprise application, it had better do its homework. Discuss the implications of this statement.
- 9-7** Which enterprise application should
MyLab MIS a business install first: ERP, SCM, or CRM? Explain your answer.

Hands-On MIS Projects

The projects in this section give you hands-on experience analyzing business process integration, suggesting supply chain management and customer relationship management applications, using database software to manage customer service requests, and evaluating supply chain management business services. Visit **MyLab MIS** to access this chapter's Hands-On MIS Projects.

MANAGEMENT DECISION PROBLEMS

- 9-8** Toronto-based Mercedes-Benz Canada, with a network of 55 dealers, did not know enough about its customers. Dealers provided customer data to the company on an ad hoc basis. Mercedes did not force dealers to report this information. There was no real incentive for dealers to share information with the company. How could CRM and PRM systems help solve this problem?
- 9-9** Office Depot sells a wide range of office supply products and services in the United States and internationally. The company tries to offer a wider range of office supplies at lower cost than other retailers by using just-in-time replenishment and tight inventory control systems. It uses information from a demand forecasting system and point-of-sale data to replenish its inventory in its 1,600 retail stores. Explain how these systems help Office Depot minimize costs and any other benefits they provide. Identify and describe other supply chain management applications that would be especially helpful to Office Depot.

IMPROVING DECISION MAKING: USING DATABASE SOFTWARE TO MANAGE CUSTOMER SERVICE REQUESTS

Software skills: Database design; querying and reporting

Business skills: Customer service analysis

- 9-10** In this exercise, you'll use database software to develop an application that tracks customer service requests and analyzes customer data to identify customers meriting priority treatment.

Prime Service is a large service company that provides maintenance and repair services for close to 1,200 commercial businesses in New York, New Jersey, and Connecticut. Its customers include businesses of all sizes. Customers with service needs call into its customer service department with requests for repairing heating ducts, broken windows, leaky roofs, broken water pipes, and other problems. The company assigns each request a number and writes down the service request number, the identification number of the customer account, the

date of the request, the type of equipment requiring repair, and a brief description of the problem. The service requests are handled on a first-come-first-served basis. After the service work has been completed, Prime calculates the cost of the work, enters the price on the service request form, and bills the client. This arrangement treats the most important and profitable clients—those with accounts of more than \$70,000—no differently from its clients with small accounts. Management would like to find a way to provide its best customers with better service. It would also like to know which types of service problems occur most frequently so that it can make sure it has adequate resources to address them.

Prime Service has a small database with client account information, which can be found in MyLab MIS. Use database software to design a solution that would enable Prime's customer service representatives to identify the most important customers so that they could receive priority service. Your solution will require more than one table. Populate your database with at least 10 service requests. Create several reports that would be of interest to management, such as a list of the highest—and lowest—priority accounts and a report showing the most frequently occurring service problems. Create a report listing service calls that customer service representatives should respond to first on a specific date.

ACHIEVING OPERATIONAL EXCELLENCE: EVALUATING SUPPLY CHAIN MANAGEMENT SERVICES

Software skills: Web browser and presentation software

Business skills: Evaluating supply chain management services

9-11 In addition to carrying goods from one place to another, some trucking companies provide supply chain management services and help their customers manage their information. In this project, you'll use the web to research and evaluate two of these business services. Investigate the websites of two companies, UPS and Schneider National, to see how these companies' services can be used for supply chain management. Then respond to the following questions:

- What supply chain processes can each of these companies support for its clients?
- How can customers use the websites of each company to help them with supply chain management?
- Compare the supply chain management services these companies provide. Which company would you select to help your firm manage its supply chain? Why?

COLLABORATION AND TEAMWORK PROJECT

Analyzing Enterprise Application Vendors

9-12 With a group of three or four other students, use the web to research and evaluate the products of two vendors of enterprise application software. You could compare, for example, the SAP and Oracle enterprise systems, the supply chain management systems from JDA Software and SAP, or the customer relationship management systems of Oracle and Salesforce.com. Use what you have learned from these companies' websites to compare the software products you have selected in terms of business functions supported, technology platforms, cost, and ease of use. Which vendor would you select? Why? Would you select the same vendor for a small business (50–300 employees) as well as for a large one? If possible, use Google Docs and Google Drive or Google Sites to brainstorm, organize, and develop a presentation of your findings for the class.

BUSINESS PROBLEM-SOLVING CASE

FAST FASHION, BIG DATA, AND ZARA

In 2015, a Japanese woman visited a Zara store in Tokyo to buy a pink scarf. Unfortunately for her, the store didn't sell any. For many retailers, this would be the end of the story—but not for Zara. The company uses big data to study the behavior of its customers to achieve what they call “customer intimacy.” The woman undoubtedly told a store assistant what she was looking for. That assistant wrote down the request and fed it into the data system. Because of this system, Zara's headquarters in Spain learned that the color pink was becoming very popular. Zara reacted quickly. After about seven days, half a million pink scarves were sent to Zara stores all over the world, to be sold out within three days.

This story demonstrates why Zara has been so successful since Amancio Ortega founded it in 1975 in Spain. Ortega has always had a very specific answer to the question of what fashion really is. A piece of clothing is, according to him, an object of love; people wear it as long as they like it and then forget about it or even throw it away. As a result, the company chose not to have one or two collections a year but about twenty. To understand how taste changes, the company needs to read the minds of its customers. Zara uses information systems to do just that and to achieve operational excellence.

Experts often observe that the success of Zara is entirely dependent on Big Data and cloud computing. The company has created a continuous information stream of valuable information that is posted to the firm's cloud-based systems and made easily accessible to employees and managers. One example of this is the way feedback by customers is integrated into the information flow. In many “traditional” stores, shop attendants either do not write down feedback or send it by email to the company headquarters. Attendants in Zara shops have mobile devices that are directly linked to the cloud. Any note that is added to the system is immediately visible in the data room in Zara's headquarters in Spain.

Points of sale, like cash tills, are linked to that information stream as well, and sales can be followed in real time at the headquarters in Spain. Zara is notoriously tight-lipped about the IT technologies it uses, but it is clear that every piece of clothing has a RFID chip. These chips are installed into an alarm system that is connected to every piece of clothing to prevent theft. According to RFID experts, these chips also allow Zara to follow items of clothing from the company's

distribution center to the shop, until the moment they are sold. Some of these experts say that the technology even allows Zara to study how many times individual items of clothing leave the shelves to be tried on in dressing rooms!

By studying all these data, Zara gets a very good idea of what customers like and why. At the data room in Spain, incoming information is continuously analyzed. At traditional clothing companies, the designer is the star of the company; at Zara, it is the data room. Incoming data is continuously being analyzed to find out which fabrics are popular and why, and which colors are preferred by customers. Designers have a supporting role here; they get specifications from the data room and design a product accordingly.

Every new product at Zara is devised by a team that consists of at least three individuals. A commercial manager has strong links to the data room and receives continuous updates on the tastes of the customers. A designer or design team (usually using CAD-CAM technology) rapidly incorporates the feedback of the public into new garment designs. A supply chain manager makes sure that the new designs can be sourced quickly and efficiently so that Zara stores can sell the new pieces of clothing within a short period of time.

All of this has transformed the world of fashion. Traditional fashion brands use a model of “pushing” rather than “pulling”; a collection is designed first, and potential buyers are sought afterwards. Instead, Zara ships pieces of clothing in small quantities to shops; if these garments turn out to be successful, the production is increased immediately. The Zara approach has several advantages. As collections change rapidly, customers visit Zara stores again and again. The average Zara customer visits shops of the Spanish brand 17 times a year (at traditional clothing companies, the average is three or four visits a year). In recent years, Zara has started experimenting with what it calls “location intelligence.” The idea behind this is that shoppers will get personal recommendations once they enter a Zara shop. Because of its “pulling” process, Zara knows what customers want and sells about 80 percent of its products at full price.

Zara works with a supply chain that is fast and lean. As speed is very important in fast fashion, the company sources most of its production to manufacturers in Spain, Turkey, and other European countries. Most traditional clothing companies source heavily in Asia (in countries like Bangladesh) to manufacture products as

cheaply as possible. Zara prefers to work with European companies, as communication is faster and more effective. Production in Europe is more expensive than in Asia, but Zara saves money by spending very little on advertisements and publicity.

The data room is very important here as well. Design teams have direct access to the information stream, so they know which designs are needed. Zara has also standardized a whole range of design features and manufacturing processes. Having such a “lexicon,” so to speak, of basic elements of the design and production processes allows designers to give clear instructions to sourcing companies. Information systems that indicate the stocks of several basic materials at sourcing companies are linked to the big “cloud” at the data room—designers know directly which materials are available, where, and in what quantities. By contrast, traditional companies complete their design first and then source, and it may take them several months to find a company that can produce the designs.

Additionally, thanks to RFID technology, it is possible for IT staff in the data room to follow every piece of clothing from the warehouse to the shop. Zara distribution centers try to speed up delivery by relying on IT systems rather than on human labor. Thus, they use

optical reading devices that are capable of processing tens of thousands of pieces of clothing per hour. This again allows staff in the data room can track what is happening in the distribution centers in real time.

Zara has thus transformed the fashion sector thanks to its heavy use of data analytics. The data room in Spain is the heart of the company: customer behavior is analyzed, sourcing is prepared, distribution processes are monitored. It is this heavy reliance on information systems that has made Zara one of the most successful fashion companies on the planet. In 2018, Zara’s parent company, Inditex, continued to record strong annual sales growth at a time when many of its rivals are struggling, including online sales growth of 27 percent over the course of the year.

Sources: Hau L. Lee, “How Extreme Agility Put Zara Ahead in Fast Fashion,” *Financial Times*, December 10, 2019; “Zara Supply Chain Its Secret to Retail Success,” TradeGecko, www.tradegECKO.com; “Zara Unveils New Delivery Plans to Compete with Asos and Boohoo,” Retail Sector, January 11, 2019, www.retailsector.co.uk; Pamela N. Danziger, “Why Zara Succeeds: It Focuses on Pulling People In, Not Pushing Product Out,” *Forbes.com*, April 23, 2018; “The Secret of Zara’s Success: A Culture of Customer Co-creation,” Martin Roll, March 2018, martinroll.com; “Online Sales Boost Zara Owner Inditex,” *BBC News*, March 14, 2018, Casey Cooper-Fiske, “RFID Technology in Zara,” *The Blog of Logistics at MGEPS at UPV*, April 11, 2017, logisticsmgepsupv.wordpress.com.

CASE STUDY QUESTIONS

- 9-13** Considering the example of the Japanese customer who wanted to buy a scarf, what methods does Zara use to analyze and predict customer behavior? Does data analytics help Zara know their customers better than they know themselves?
- 9-14** Zara sources its products mostly in Europe. Give a list of advantages and disadvantages of sourcing in countries like Spain and Portugal as opposed to sourcing in, for instance, Bangladesh.
- 9-15** At the headquarters of Zara in Spain, the staff in the data room have an overview of the stocks that sourcing companies have of the fabrics needed to produce its clothes. Explain why this overview is essential for a fast-fashion company like Zara.
- 9-16** What does Zara mean by “location intelligence”? Is this a good way to draw customers to physical shops and convince them to not do their shopping online?

Case contributed by Bernard Bouwman

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