Innovative EC Systems: From E-Government to E-Learning, E-Health, Sharing Economy, and P2P Commerce

5

Contents

Learning Objectives

Upon completion of this chapter, you will be able to:

1. Describe various e-government initiatives.
2. Describe e-government activities and implementation issues including government 2.0 and m-government.
3. Describe e-learning, virtual universities, and e-training.
4. Describe e-books and their readers.
5. Describe e-health.
6. Describe digital disruption.
7. Describe ride sharing and accommodation sharing.
8. Describe P2P models in e-commerce.

OPENING CASE
E-GOVERNMENT IN ESTONIA

Estonia is a small country in Eastern Europe (less than 1.5 million residents). It developed one of the most successful e-government programs.

E. Turban et al., *Electronic Commerce 2018*, Springer Texts in Business and Economics, DOI 10.1007/978-3-319-58715-8_5

The Problem

Estonia was a fairly poor country after it became independent of the Soviet Union. Its information technology was undeveloped despite its proximity to the nordic countries which are technologically advanced. By the end of the 1990s, it became clear that the country must develop the needed information technology, including EC, in order to transform its government services to an e-government.

The Solution

Fortunately, politicians and officials were willing to get involved, providing the necessary efforts and funds. Estonia managed to take the concept of e-society and make it reality.

Being a poor country, Estonia could not afford to simply transfer paper bureaucracy to digital one. So, it was necessary not only to get the financing but also the backing of the entire population. Since the country was in a transitional phase, where new norms were just formed, it was easy to introduce behavioral and other changes.

In addition, Estonia is using flexible strategy. The country monitors global ICT trends and domestic digital society and EC and acts accordingly. Also, they received the cooperation of the private sector, academicians, and any one that has had relevant knowledge, including the politicians and the Prime Minister. Finally, the project was coordinated with the European Union and the OECD in Europe.

Sample Applications (per Kwang 2017a)

- **Electronic ID Card**. Each Estonia citizen carries ID smart card which provides access to over 1000 public services. The chip on the card carries embedded files which, using 2048-bit public key encryption, enable it to be used as definitive proof of ID in an electronic environment. The ID card can be used for numerous purposes—digital signatures, accessing government databases, electronic voting, prepaid transport, and logging into bank accounts.
- **E-Residency.** The country is known as "the country-as-a-service." This service is open to anyone in the world. E-residents can set up a company online within a day, digitally sign documents and contracts, encrypt and transmit documents securely, and administer the company from anywhere in the world. All these services have been available for over a decade. Over 13,000 e-residency cards have been issued by January 2017. This service aims at attracting foreign investors.
- **Digital Signature.** Estonia's digital signature system has paved the way for its numerous e-services, from i-voting systems to electronic tax filing. The system is freely used by businesses as well and has been applied to a variety of Web-based services. More than 242 million digital signatures have been made since its inception in 2000. Electronic signatures have the same legal weight as traditional paper signatures. The nation's electronic ID infrastructure created an effective and universal system for secured identification.
- **X-Road Data Exchange.** The backbone of e-Estonia, X-Road, is the data exchange layer that connects the nation's various services and databases, both in the public and private sector. X-Road enables a range of complex services for citizens. Over 2000 services and 900 organizations make use of X-Road daily in Estonia.
- **i-Voting.** Estonia's Internet voting system allows voters to login using an ID card and cast their ballots from any Internet-connected computer, anywhere in the world.

  In 2005, Estonia became the first country in the world to hold nationwide elections using this method and, in 2007, the first country to use i-voting in parliamentary elections.
- **E-Cabinet.** E-Cabinet is used by the government to streamline the decision-making process, allowing ministers to prepare for cabinet meetings, conduct them, and review minutes, entirely without paper.

  With the e-Cabinet system, the average length of weekly cabinet meetings was cut from 4 to 5 h to just 90 min. The government also eliminated the need to print and deliver thousands of pages of documents each week—a significant reduction in environmental impact and cost.
- **E-School.** E-school is a platform for education stakeholders to collaborate and organize teaching and learning programs and information. Teachers enter grades and attendance information in the system, post homework assignments, and evaluate students' behavior. Over 85% of Estonia's schools e-school, covering 95% of all grade school students.
- **E-Healthcare.** Estonia's nationwide electronic health record system integrates data from different healthcare providers to create a common record for each patient.

Doctors can access a patient's record from a single electronic file, read test results and x-ray scans as soon as they are ready, and prescribe medication to patients electronically. The system also compiles data for national statistics to measure health trends, track epidemics, and ensure that health resources are being spent wisely.

The Results

Here are some concrete examples of the benefits that e-governance brings to Estonia:

- It makes people's lives easier and more convenient—as digital signing and online voting have done.
- It improves the business environment—you can reduce red tape and hassles for company registration and management (as done with easy annual reporting solutions in the electronic business registry).
- It makes government more efficient—from top-level decision-making in the Cabinet (e.g., via the use of e-Cabinet), to everyday frontline services and back offices.
- It makes government more effective, allowing better delivery policy goals—for example, the introduction of real-time database access for police patrols (e-police) leads to cases being quickly solved.
- It enhances transparency of governance and citizen participation—e-Cabinet and e-consultation contribute greatly to hearing people's opinions in national decision-making and for publishing relevant information almost instantly.
- The cumulative time saving in Estonia parliamentary election in 2011, for example, was 11,000 working days.
- Estonians in 116 countries casted votes during the 2015 parliamentary election.

Sources: Compiled from Kwang (2017a) and **estonia.com/estonias-road-e-governance-went-right** (accessed January 2017)

LESSONS LEARNED FROM THE CASE

Even small and not affluent countries are embarking on digitization of their governments. The objective is to improve services, cut costs, and have the citizens involved. Estonia did it successfully (the small size of the country helped, but the collaboration of all and the wide support were critical success factors). The major activities of e-government are the subject of this chapter. We also present the related activities of e-learning and training and e-health. Finally, we present the innovative EC applications delivered by shared economy models as well as the person-to-person EC major activities.

5.1 DIGITAL GOVERNMENT: AN OVERVIEW

Electronic government, also known as *e-government* or *digital government*, is a growing e-commerce application area that encompasses many topics as illustrated in the opening case. It refers to the various levels of government: city, county, and country. The area's major objective is to bring public sector institutions into the digital age. For an overview, see Brown et al. (2014). This section presents the major topic areas.

Definition and Scope

E-government refers to the use of information technology and communication (ITC) in general, and e-commerce in particular, to improve the delivery of government services and activities in the public sector, such as providing citizens with more convenient access to information and services and providing effective delivery of government services to citizens and businesses as well as improving the performance of government employees. It also is an efficient and effective way for governments to interact with citizens, businesses, and other entities and to improve governmental business transactions (such as buying and selling goods and services) and to operate effectively within the governments themselves. E-government includes a large number of activities, as can be seen in the opening case and in **en.wikipedia.org/wiki/E-Government**. For details, see Anderson et al. (2015). For resources, see **w3.org/egov**.

Note that e-government also offers an opportunity to improve the efficiency and effectiveness of the internal operation of a government.

Table 5.1 Representative categories of e-government performance objectives

G2C	G2B
Reduce the time needed to interact with the government	Increase the ability for businesses to find, view, and comment on rules and regulations
Create a friendly single point of access to government services for individuals	Reduce the burden on businesses by enabling online filing of taxes and other documents
Reduce the time spent in finding federal jobs	Reduce the time to fill out export forms and locate related information
Reduce the average time for citizens to find benefits and determine eligibility	Reduce the time for businesses to comply with government regulations
Increase the number of citizens who use the Internet to find information on recreational opportunities	
Meet the high public demand for information	
Improve the value of government services to its citizens	
Expand access to information for people with disabilities	
Make obtaining financial assistance from the government easier, cheaper, quicker, and more comprehensible	
G2G	**IEE**
Decrease time needed to respond to emergency incidents by government agencies	Increase availability of training programs for government employees
Reduce the time to verify public records	Reduce the average time to process clearance forms
Increase the number of grant programs available for electronic applications	Increase the use of e-travel services within each agency
Increase efficiency of communication between federal, state, local, and tribal governments	Reduce time and overhead costs to purchase goods and services throughout the federal government
Improve collaboration with foreign partners, including governments and institutions	Plan IT investments more effectively
Automate internal processes to reduce costs within the federal government by disseminating the best practices across agencies	Secure better services at a lower cost
	Cut government operating costs

Sources: Based on Egov (2003) and the authors' experiences

E-government includes the following major categories: government-to-citizens (G2C), government-to-business (G2B), government-to-government (G2G), internal efficiency and effectiveness (IEE), and government-to-employees (G2E). The major activities of the first four categories are provided in Table 5.1 (also see Digital Government Strategy 2012). For a description of the range of e-government activities in the United States, see Digital Government Strategy (2012) and **whitehouse.gov/omb/e-gov**. Of special interest is the recent document titled "Digital Government" (**whitehouse.gov/sites/default/files/omb/egov/digital-government/digital-government.htm**). For examples of e-government in Singapore, see **gov.sg**.

Example: The European Commission

The European Commission's Digital Agenda website (**ec.europa.eu/digital-agenda/welcome-digital-agenda**) is an example of a comprehensive e-government system. It is one of the European Union's seven flagships for achieving its 10-year growth strategy. The site is divided into several topics—notably, life and work, public services, ongoing studies, smart cities, and e-health and aging. For details, see **ec.europa.eu/digital-agenda/welcome-digital-agenda**.

The above categories are based on different entities with whom the government is interacting. However, these entities are also interconnected, as shown in the broken lines of Fig. 5.1.

The following is a brief description of the major activities conducted between the government and each major entity.

Government-to-Citizens

The **government-to-citizens (G2C)** category includes all the interactions between a government and its citizens that take place electronically. G2C can involve dozens of different initiatives. The basic idea is to enable citizens to interact electronically with the government from anywhere and at any time. G2C applications enable citizens to ask questions of government agencies and receive answers, pay taxes, receive payments and documents, and schedule services, such as employment interviews and medical appointments. For example, in many US states, residents can renew driver's licenses, pay traffic tickets, and make appointments for vehicle emission inspections and driving tests—all online.

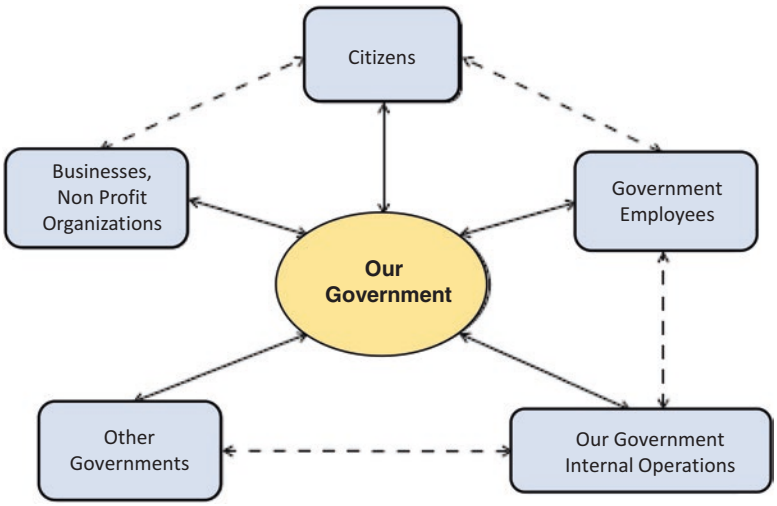

Fig. 5.1 E-government categories of activities

The major features of government websites are information on how to contact the government, public notices to citizens, links to other sites, educational material, publications, statistics, legal notes, and databases. The major areas of such G2C activities are social services, tourism and recreation, public safety, research and education, downloadable forms, discovery of government services, tax filing, information about public policy, and advice about health and safety issues. G2C is now available on mobile/wireless devices in many countries and local governments.

Another area of G2C activity takes place by solving citizens' problems. The government (or a politician) can use CRM-type software to assign inquiries and problem cases to appropriate staff members (as shown on **ict.govt.nz**). Subsequently, workflow CRM software can be used to track the progress of the problems' resolution.

Note that over 20 countries (e.g., China, North Korea, Iran, Syria) block some websites for political, social, or other reasons. For more on G2C, see **usa.gov/Citizen/Topics/All-Topics.shtml**. For an overview of major citizens' groups and the services provided to them by the US Department of Labor, see **dol.gov/_sec/e_government_plan/p41-43_appendixe.htm**.

Two popular examples of G2C are provided next.

Electronic Voting

Voting processes may be subject to errors, manipulation, and fraud. In many countries, there are attempts to "rig" the votes; in others, the losers want a manual recount. Voting may result in major political crises, as has happened in several countries. Problems with the US 2000 and 2004 presidential elections have accelerated the trend toward electronic voting.

The voting process encompasses a broad spectrum of technological and social activities from voter registration and voter authentication to the casting of ballots and subsequent tallying of results. For an example of this process, see Fig. 5.2. Electronic voting automates some or all steps in the process.

Fully electronic voting systems have raised considerable controversy because of a variety of relevant factors, such as the proprietary nature of the software. Typical issues are the difficulties in selling the systems to voters, complex auditing, and the lack of experience in some steps of the process.

Hackable Elections

A debatable issue is the possibility of fraud in electronic voting (Madden 2015). The possibility of fraud is larger if the e-voting machines that do not have paper trails are used. For a discussion, see Gross (2016). Note that it is difficult to hack e-voting systems that are not on the Internet but on government-protected networks. However, some have suggested during the 2016 presidential elections in the United States, that some non-voting systems (e.g., the Democratic National Commission's files) were compromised.

For more information on e-voting, see **en.wikipedia.org/wiki/Electronic_voting** and the Electronic Frontier Foundation (**eff.org**).

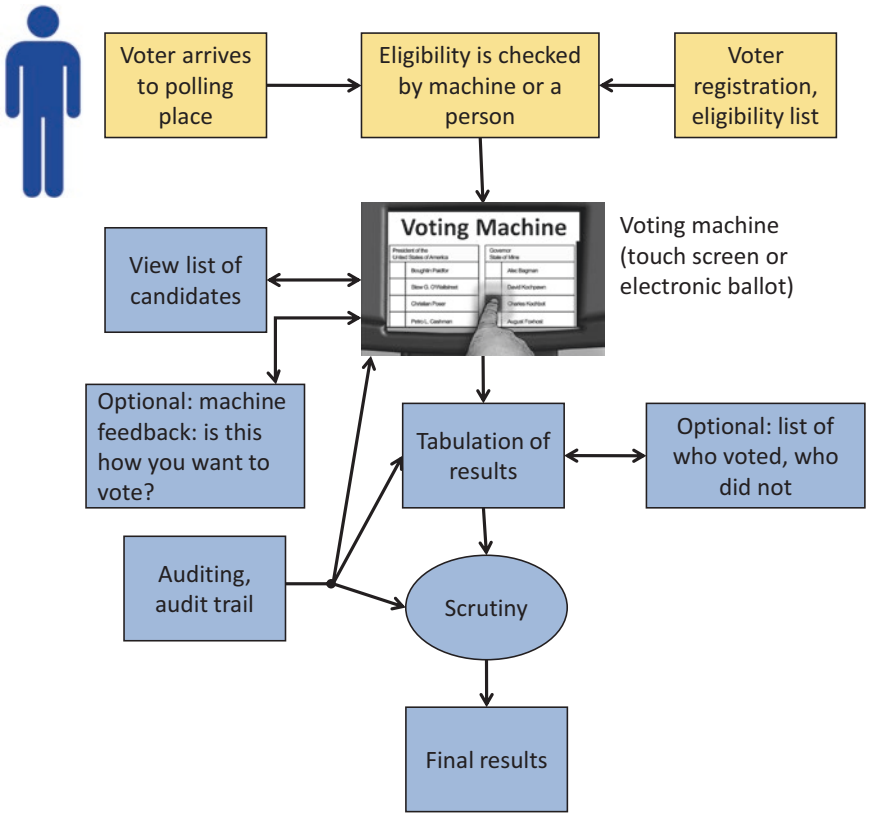

Fig. 5.2 The process of using a voting machine

Electronic Benefits Transfer

One e-government application that is not new is the electronic benefits transfer (EBT). It has been available since the early 1990s and is now in use in many countries. The US government transfers billions of dollars in benefits to many of its citizens on a regular basis. Beginning in 1993, an attempt was made to deliver benefits to recipients' bank accounts. However, more than 20% of payments go to citizens who do not have a bank account. To solve this problem, the government initiated the use of smart cards (see Chap. 12). Lately, some governments provide money transfer to smartphones. Benefit recipients can load the money they receive onto the cards and use the cards at automated teller machines (ATMs), point-of-sale locations, and grocery and other stores, just like other prepaid value cards. The advantage is not only the reduction in processing costs (from about 50¢ per paper check to 2¢ for electronic payment) but also the reduction of fraud. With biometrics (see Chap. 11) coming to smart cards and PCs, officials expect a substantial reduction in fraud. EBT has been implemented in all states since 2004. For more information on EBT in government, see **www.fns.usda.gov/ebt/general-electronic-benefit-transfer-ebt-information**.

In several developing countries (e.g., India, Brazil), governments are using mobile payments to transfer benefits to citizens.

Government-to-Business

Governments seek to automate their interactions with businesses. Although we call this category **government-to-business (G2B)**, the relationship works in two ways: government-to-business and business-to-government. Thus, G2B refers to activities where the government sells products to businesses or provides businesses with services and vice versa. Two key G2B activities are e-procurement and the auctioning of government surpluses. For other US G2B initiatives for businesses and nonprofits, see **usa.gov/Business/Business-Gateway.shtml.**

Government E-Procurement

Governments buy large amounts of MROs (maintenance, repair, and operations; Chap. 4) and other materials directly from suppliers. In many cases, RFQ (or tendering) systems are mandated by law. For years, these RFQs were done manually; the systems are now moving online. These systems utilize reverse (buy-side) auction systems, such as those described in Chap. 4. Governments provide all the support for such tendering systems. For additional information about such reverse auctions, see

GSA Auctions (**gsaauctions.gov/gsaauctions/gsaauctions**). In the United States, for example, the local housing projects of HUD (Housing and Urban Development), which provides housing to low-income residents, are moving to e-procurement.

Example 1: Procurement at GSA
The US General Services Administration (**gsa.gov**) uses technologies such as demand aggregation and reverse auctions to buy items for various units of the federal government (see also **governmentauctions.org** and **liquidation.com**).

Example 2: The US SBA
The Procurement Marketing and Access Network of the Small Business Administration (**sba.gov**) has developed a service called PRO-Net (**pro-net.sba.gov**). It is a searchable database that contracting officers in various US government units can use to find products and services sold by small, disadvantaged businesses or businesses owned by women.

Group Purchasing

Many government agencies also utilize online group purchasing, which was described in Chaps. 3 and 4. A related aspect is *quantity discount*, where suppliers post prices that get lower as quantities of orders increase. A similar method occurs when government buyers initiate group purchasing by posting product requests that other buyers may review and then join the group(s).

Forward and Reverse E-Auctions

Many governments auction equipment surpluses or other goods, ranging from vehicles to foreclosed real estate. These auctions are now moving to the Internet. Governments can auction from a government website, or they can use third-party auction sites such as **ebay.com**, **bid4assets.com**, or **governmentauctions.org**. The US General Services Administration (GSA) in the United States operates a property auction site online (see **gsaauctions.gov**), where real-time auctions for surplus and seized goods are conducted. Some of these auctions are restricted to dealers; others are open to the public (see **governmentauctions.org**). More common is the use of reverse auctions for purchasing goods and services, as described in Chap. 4.

Government-to-Government

The **government-to-government (G2G)** category consists of EC activities between different units of governments, including those within one governmental body. Many of these are aimed at improving the effectiveness and the efficiency of government operations. Here are G2G examples from the United States:

- **Intelink**. Intelink (**intelink.gov**) is an intranet that contains classified information that is shared by the numerous US intelligence agencies. It is a US government computer system that is provided only for authorized US government use.

Government-to-Employees and Internal Efficiency and Effectiveness

Governments are introducing various EC initiatives internally. Two areas are illustrated next.

Government-to-Employees (G2E)

Governments are just as interested, as private sector organizations are, in providing services and information electronically to their employees. **Government-to-employees (G2E)** applications refer to e-commerce activities between the government and its employees. Such activities may be especially useful in enabling efficient e-training of new employees, e-learning for upgrading skills, and communication and collaboration activities. Other typical services are e-payroll, e-human resource management, and e-recruiting.

Internal Efficiency and Effectiveness (IEE)

Governments have to improve the efficiency and effectiveness of their operations in order to stay within their budgets and avoid criticism. Unfortunately, not all governments (or units within governments) are efficient or effective. Automation, including e-commerce, provides an opportunity to significantly improve operations.

The following example illustrates some e-commerce applications for improving IEE.

Example

The US Office of Management and Budget (OMB) (whitehouse.gov/omb) provides a list of activities related to IEE in their FY 2011 "Report to Congress" (see Office of Management and Budget 2012).

This list includes topics such as:

- Federal Cloud Computing Program Management
- Innovative Wireless and Mobile Apps Platform
- FedSpace (a collaborative platform for Federal employees)
- Federal Data Center Consolidation Initiative
- Small Business Dashboard
- IT Dashboard (also available via mobile devices)
- Performance.gov (a website with information about performance improvement activities)

In addition, there are traditional IEE-related initiatives such as e-payroll, e-record management, e-training, integrated acquisition, and e-HRM.

Implementing E-Government

Like most other organizations, government entities want to become digital. Therefore, one can find a large number of EC applications in government organizations. For many practices and examples, see Mei Hua and Rohman (2015), Wohlers and Bernier (2016), and the Government Innovator Network at **innovations.harvard.edu**.

This section examines some of the trends and issues involved in implementing e-government. Note that one of the major implementation inhibitors is the desire of many governments to maintain control over the use and dissemination of data and knowledge.

The Transformation to E-Government

The transformation from traditional delivery of government services to full implementation of e-government may be a lengthy process. For the digitization process, see Corydon et al. (2016).

All major software companies provide tools and solutions for conducting e-government. One example is Cognos (an IBM Company; see **ibm.com/analytics/us/en/technology/cognos-software**). The company also provides free white papers.

E-Government 2.0 and Social Media and Networking

By employing social media tools and new business models and embracing social networks and user participation, government agencies can raise the effectiveness of their online activities to meet users' needs at a reasonable cost. Such initiatives are referred to as **Government 2.0**. For extensive coverage of content and applications of this topic, see Dalton (2016), Imholt (2015), and Grogan (2015). Government agencies around the world are now experimenting with social media tools as well as with their own pages and presence on public social network sites. Governments are using Web 2.0 tools mainly for collaboration, dissemination of information, e-learning, and citizen engagement.

Example

The US Coast Guard uses YouTube, Twitter, and Flickr to disseminate information and discuss their rescue operations. Notable is FEMA's Twitter feed (previously "FEMA in Focus"), a channel that provides dissemination of FEMA-related information (see **twitter.com/fema**). Law enforcement agencies use social media (such as Facebook and Twitter) to hunt for criminals. (For some examples, see **digitaltrends.com/social-media/the-new-inside-source-for-police-forces-social-networks**.) For more on how government agencies are expanding their uses of social media, see **federalnewsradio.**

com/445/3547907/Agencies-open-the-door-to-innovative-uses-of-social-media. For more examples, see Grogan (2015). For case studies in e-government 2.0, see Boughzala et al. (2015). For case studies about how e-government 2.0 is changing citizens' relationships, see Boughzala et al. (2016).

The Potential of E-Government 2.0 (Social Media)

Many governments are embarking on e-government 2.0 initiatives.

For an extensive list of resources on social networks in governments, including reports, applications, and policies, see **adobe.com/solutions/government.html?romoid=DJHAZ**. For extensive coverage of e-government, see **wisegeek.com/what-is-e-government.htm**.

M-Government

Mobile government (m-government) is the implementation of e-government applications using wireless platforms and mobile devices, especially smartphones. It is done mostly in G2C (e.g., see Government of Canada Wireless Portal; **mgov-world.org**). M-government uses wireless Internet infrastructure and devices. It is a value-added service, because it enables governments to reach a larger number of citizens (e.g., via smartphone or Twitter) and it can be more cost-effective than wireline-based EC platforms. It is very useful in disasters (e.g., emergency notifications), is fast (e.g., in conducting surveys and polls), and is convenient for citizens as well. In addition, governments employ large numbers of mobile workers who are supported by wireless devices.

M-government is offered mostly in education, health, financial services, welfare, and environment control. For data regarding the percentage of m-government offered by governments in each category in 2014 and 2016, see **statista.com/statistics/421693/e-government-availability-mobile-serevices**. For innovative mobile applications for citizens, see Kwang (2016a).

Example: Public Buses in Honolulu

An example of a mobile government project is the city government–run bus location system (an app) in Honolulu, Hawaii, called "DaBus" (**honolulu.gov/mobile**). Using your cell phone, you can find the estimated arrival time of any of the buses at more than 4000 bus stops. Buses are equipped with GPS devices that transmit the bus's location in real time. The system then calculates the estimated arrival time for each stop. Similar systems exist in many other places (e.g., in Singapore "IRIS," in the USA "NextBus," and in the United Kingdom "JourneyPlanner" apps).

M-government can help make public information and government services available anytime and anywhere. See **usa.gov/mobileapps.shtml**. A specific example of m-government would be texting a mass alert to the public in the event of a major disaster.

Smart Cities

Smart cities are frequently implemented as e-government projects, and they include digitization of government services, transportation, education, e-health, etc. (see details in Chap. 7). For how this is done in Nigeria, see Akwaja (2017).

The Benefits of M-Government

The major benefits of m-government are:

- More citizens and employees can be reached (anyplace, anytime).
- Cost reduction (e.g., by increasing productivity of employees, reduced budgets).
- Modernizing the operations of the government (e.g., employ mobile devices).
- Employees can bring their own mobile devices to work, saving hardware and software costs.
- Providing quality, flexible services to the public.
- Increasing the reach and speed for public dissemination of information.

In addition, many of the generic benefits of m-commerce (Chap. 6) are valid in m-government too.

Some Implementation Issues

Representative issues of implementing m-government are:

- An expensive infrastructure may be needed to supplement the existing traditional infrastructure. More infrastructures are needed for the wireless systems as well as for the increased volume of information flow (see the closing case in this chapter).
- It may be difficult to maintain security and privacy of information on public mobile networks.
- For many citizens, mobile devices are too small or complex to use.
- In many countries, there is a lack of standards and legislation regarding the use of data delivered wirelessly.

Cutting-Edge Technologies in e-Government

Many city, state and even country governments are implementing or experimenting with cutting-edge technologies, mostly artificial intelligent-related.

Here are few examples:

Artificial Intelligence (AI) Applications

Many believe that AI is the next big thing for governments (e.g., Newcombe 2016). Kwang (2017b) reports about publications of the US Government Office for Science on the future of artificial intelligence (AI) and its impact on society. In general, AI is expected to increase innovation and productivity, enable more efficient use of resources, enable new business models, enable improved health (see section "E-Health"), reduce the burden of search, and improve governmental decision-making. In addition, it will help to make more use of data and make government departments to better understand those people and other departments that they serve. In addition AI will act as a virtual advisor.

Virtual Advisors

Virtual advisors (Chap. 7) are getting smarter and can assist both government employees and citizens in providing information and in decision-making.

Chatbots

These are already used in airports, government offices, public museums, etc. as guides. These are robots equipped with knowledge about the areas they serve. Users can conduct Q&A sessions with them. Spinosa (2016) describes potential applications. Chatbots are parts of the virtual advising.

For an overview, see Haisler (2016).

Virtual Reality and Augmented Reality

Virtual and augmented reality may have huge impact for governments in their contacts with citizens, in increasing productivity, in training provide by governments (see section "E-Learning, E-Training, and E-Books"), and in their research and development activities. For details, see Lohrmann (2016); Thomas (2016) explores the impact on government analytics.

How Chatbots Will Affect Government

According to Haisler (2016), chatbots will have the following effects:

1. Personal chatbots will enable citizens to experience government without visiting physical government facilities (e.g., via Q&A sessions).
2. Enterprise chatbots can help in optimizing customer service provided by government employees.
3. Chatbots will facilitate civic engagements, eliminating the need to go to council meetings, and search lots of information to find answers to questions.
4. Chatbots will facilitate collective intelligence, enabling citizens to interact with data.

For further discussions, see Estopace (2016c).

Other Areas

In section "E-Learning, E-Training, and E-Books", we describe how AI and chatbot facilitate e-learning. Smart computers, such as IBM Watson, can help governments to better anticipate citizens' needs. The Internet of Things (Chap. 7), predictive analytics, and robots can increase the efficiency of the governments.

SECTION 5.1 REVIEW QUESTIONS

1. Define e-government.
2. What are the four major categories of e-government services?
3. Describe G2C.
4. Describe how e-voting works.
5. Describe the two main areas of G2B activities.
6. How does government use EC internally and when dealing with other governments?
7. Describe e-government social networking activities. What are some potential benefits?
8. Describe m-government and its implementation issues.
9. Describe some cutting-edge technologies for e-government.

5.2 E-LEARNING, E-TRAINING, AND E-BOOKS

The topic of e-learning is gaining much attention, especially because even first-rate universities such as MIT, Harvard, and Stanford in the United States and Oxford in the United Kingdom are implementing it. Figure 5.3 shows the forces that are driving the transition from traditional education to online learning. E-learning also is growing as a method for training and knowledge creation in the business world and is becoming a major e-business activity. In this section, we will discuss several topics related to e-learning. For a comprehensive coverage of e-learning in higher education, see Garrison (2016).

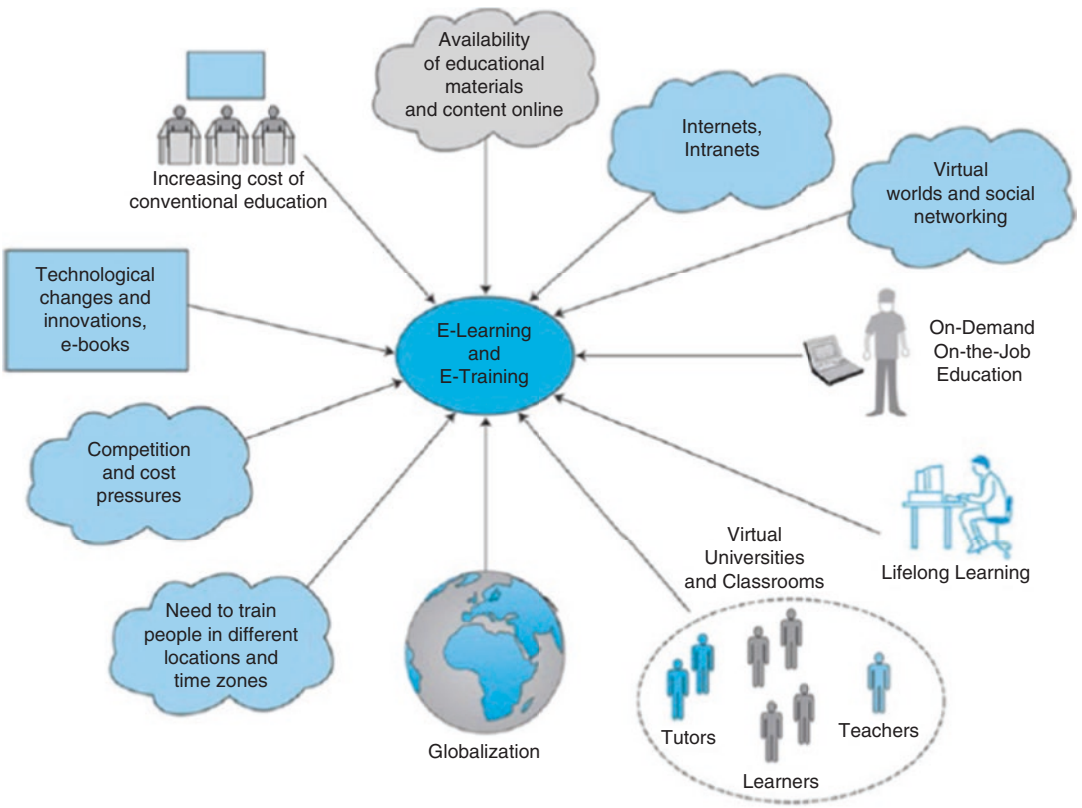

Fig. 5.3 The drivers of e-learning

The Basics of E-Learning: Definitions and Concepts

There are several definitions of e-learning. A working definition of **e-learning** is the use of online delivery of educational materials and methods, using information technologies, for the purposes of learning, teaching, training, or gaining knowledge at any time and at many different locations (see **people.howstuffworks.com/elearning1.htm**, **en.wikipedia.org/wiki/E-learning**, and **webopedia.com/TERM/E/e_learning.html**).

E-learning is broader than the term *online learning*, which generally refers exclusively to Web-based learning. E-learning includes *m-learning* (or *mobile learning*) that is used when the material is delivered wirelessly to smartphones, tablets, or other mobile devices (description to follow). E-learning is synonymous with *computer-based instruction*, *computer-based training*, *online education*, and other terms.

It appears in a variety of electronically supported learning and teaching activities, ranging from virtual classrooms to mobile conferences. E-learning includes a variety of methods of computer-facilitated learning ranging, from self-study with DVDs to online degrees offered by universities. E-learning may also include the use of Web-based teaching materials and hypermedia, multimedia CD-ROMs, learning and teaching portals, discussion boards, collaborative software, e-mail, blogs, wikis, chat rooms, computer-aided assessments, educational animation, simulations, games, learning management software, and more.

An interesting school without classrooms is the Hellerup School in Denmark. Students there "learn by doing" and even determine the best way they can learn. For how the school operates, **see theglobeandmail.com/report-on-business/economy/canada-competes/no-classrooms-and-lots-of-technology-a-danish-schools-approach/article12688441** and Millar (2013). For more on e-learning, see **en.wikipedia.org/wiki/E-learning**. For a community and resources for e-learning professionals, see **elearningguild.com**.

Benefits and Drawbacks of E-Learning

E-learning has many benefits both to the teaching institutions and to the learners. However, it also has several drawbacks, thus making it a controversial topic.

Benefits of E-Learning

In the Internet age, skills and knowledge need to be *continually updated* and refreshed (lifetime learning) to keep up with today's fast-paced business and technological changes. This means that more people need to learn and frequently do so in nontraditional ways. E-learning supports such learning due to the following capabilities and benefits:

E-learning can be very useful in developing countries. For an example of positive results in Jamaica, see Thompson (2014). For the top ten e-learning statistics in 2014 with an infographic, see **elearningindustry.com/top-10-e-learning-statistics-for-2014-you-need-to-know**. For how to teach with e-learning including the design of material, see Clark and Mayer (2016).

- **Education.** Students can learn at home and keep their regular jobs while in school. Busy homemakers can earn degrees.
- **Learning and training time reduction.** E-learning can expedite training time by up to 50%.
- **Cost reduction.** The cost of providing a learning experience can be reduced by 50–70% when classroom lectures are replaced by e-learning sessions. This includes reduced faculty cost, no classrooms, and less or no travel time.
- **Large number and diversity of learners.** E-learning can provide training to a large number of people from diverse cultural backgrounds and educational levels, even though they are at different locations in different time zones. Large companies such as Cisco Systems, Inc. (**cisco.com**), provide online training courses to a large number of employees, customers, and business partners.
- **Innovative teaching.** Ability to provide innovative teaching methods such as special engagements, interaction with experts, interaction with learners in other countries, and so forth.
- **Measurement and assessment of progress.** Ability to assess progress in real time, find areas of difficulties, and design remedial work.
- **Self-paced and motivation learning.** E-learning students usually are self-paced and self-motivated. These characteristics may result in higher content retention (25 to 60% higher than with traditional lecture-based training).
- **Richness and quality.** E-learning enables the use of top instructors as well as employing rich multimedia support. This may make learning more enjoyable. Difficult content can be made interesting and easy to understand. Overall, the quality of learning may increase.

- **Flexibility.** E-learners are able to adjust the time, location, content, and speed of learning according to their own personal schedules.
- **Updated and consistent teaching material.** It is almost impossible to economically update the information in textbooks more frequently than every 2 or 3 years; e-learning can offer real-time access to the most updated knowledge. Delivery of e-learning may be more consistent than that of material presented in traditional classroom learning, because variations among teachers and teaching materials are minimized.
- **Ability to learn from mobile devices.** This helps learning in any place and at any time as well as providing support to learners by teachers and peers.
- **Expert knowledge.** In contrast with the knowledge of a single instructor in the classroom, e-learning may include the knowledge of several experts, each of whom prepares a teaching module in his or her area of expertise.
- **Fear-free environment.** E-learning can facilitate learning for students who may not wish to join a face-to-face group discussion to interact with peers or teachers.

Drawbacks and Challenges of E-Learning

Despite the numerous benefits for both the learners and the teaching organizations, e-learning does have some drawbacks, such as the following:

- **Need for instructor retraining.** Some instructors do not have the knowledge to teach by electronic means and may require training, which costs money.
- **Equipment needs and support services**. Additional funds are needed (by the teaching institute) to purchase e-learning systems that supplement traditional ones. These are needed for e-learning creation, use, and maintenance.
- **Lack of face-to-face interaction and campus lifestyle.** Many feel that the intellectual stimulation that takes place through interaction in a classroom with "live" instructors and peers cannot fully be replicated with e-learning.
- **Assessments and examinations.** In the higher education environment, one criticism is that professors may not be able to adequately assess student work completed through e-learning. There is no way of knowing, for example, who actually completed the assignments or exams. (Nevertheless, the same is true for any homework done outside the classroom.)
- **Creation, maintenance, and updating.** It is not simple to prepare material and design courses online. (For how to do it, see Vai and Sosulski (2015).) Although e-learning materials seem to be easier to update than traditionally published materials, there are practical difficulties (e.g., cost, instructors' time) in keeping e-learning materials current. The content of e-learning material can be difficult to maintain due to the lack of ownership of, and accountability for, website material. The developers of online content might not be those who update it.
- **Need for reliable wireline and wireless communication networks and devices.** Privacy needs to be protected as well as systems need to be secured.
- **Protection of intellectual property.** It is difficult and expensive to control the transmission of copyrighted works downloaded from the e-learning platform.
- **Student retention.** Without some human feedback and intervention, it may be difficult to keep certain students engaged and energetic.

The top constraints for corporate e-learning are (1) too costly to create and maintain, (2) difficulties persuading people to learn in new ways, (3) insufficient technological support, (4) employee hesitation to contribute to social learning, and (5) learners may prefer traditional classroom instruction.

Advanced technologies can reduce some of the above and other drawbacks and constraints. For example, some online software products have features that help stimulate student thinking. Biometric controls can be used to verify the identity of students who are taking examinations from a distance. However, these features add to the costs of e-learning.

For more about the disadvantages of e-learning, see **academia.edu/4052785/Advantages_and_Disadvantages_of_e_Learning**.

Distance Learning and Online Universities

The term **distance learning**, also known as *distance education*, refers to education where the teacher and students are in different locations. In such a case, the student is separated from a classroom by distance and possibly time. Sometimes students meet once or twice at a physical location in order to get to know each other, meet the instructor or coordinator, or take examinations. Distance learning is becoming widely used in universities and learning institutions around the globe. Major universities offer courses and degrees via this mode, which is becoming more recognized and acceptable. For details, see **onlineeducation.net**.

Virtual Universities: Real Degrees

The concept of **virtual universities**, online universities where students take classes from home via the Internet, is expanding rapidly. Hundreds of thousands of students in many countries, from the United Kingdom to Israel to Thailand, are taking online classes. A large number of existing universities, including Stanford University and other top-tier universities, offer online education of some form; for example, MIT offers thousands of their courses online (see courses at **ocw.mit.edu/index.htm**). Millions of independent learners from all over the world (students, professors, self-learners) log on to the MIT OpenCourseWare site each year (see **ocw.mit.edu/about** and **ocw.mit.edu/about/site-statistics**). Some universities, such as the University of Phoenix (**phoenix.edu**), National University (**nu.edu**), and University of Maryland (**umuc.edu**), offer hundreds of courses and dozens of degrees online to students worldwide. The California Virtual Campus (cvc.edu) provides a directory and links to thousands of courses and online degree programs offered by colleges and universities in California (see **cvc.edu/courses**). For information about distance learning resources and online universities, see **distancelearn.about.com**. For a list of the top online MBA programs in the world, see **onlinemba.com/rankings**.

Innovations in E-Learning

There are many innovations in e-learning, one of which is shown in the following example.

Example: E-Learning via Robots

In December 2010, the city of Daegu in South Korea introduced 29 robots into 19 elementary schools. Each robot, about 3.2-feet tall, was designed to teach English to the students. Developed by the Korea Institute of Science and Technology (KIST), the robots roll around on wheels and ask questions in English (see Fig. 5.4). (For details, see **cnet.com/news/korean-schools-welcome-more-robot-teachers**.)

The robots can be moved around the classroom by the instructor (via remote control), which facilitates the interaction of teachers with students. The robots can read books to the students and even "dance" to music. The robots display the face of a "teacher." The tutoring is actually provided by experienced teachers in the Philippines, who are paid much less than Korean teachers. The robots are programed to use the most effective and current teaching methods (e.g., using multimedia games).

Fig. 5.4 EngKey—a robot English teacher (Source: The Korea Advanced Institute of Science and Technology. Used with permission)

Cameras detect the Filipino teachers' facial expressions and instantly reflect them on the robot's avatar face. The students participate more actively, especially the shy ones who are afraid of speaking out loud. The robots are also used in remote rural areas where English teachers are in short supply.

For more examples on educational robotic teachers, see **nytimes.com/2010/07/11/science/11robots.html?pagewanted=all&_r=0**.

Online Corporate Training

With the increased use of smart technologies (Chap. 7) comes the possibility of massive replacement of jobs by machines. Therefore, companies will need to retrain many of their employees (see Gaikwad 2016).

Like educational institutions, a large number of business organizations are using e-learning on a large scale. Many companies, such as Cisco Systems (**cisco.com**), offer online training. A study by the American Society for Training and Development found that nearly one third of corporate training content was delivered electronically.

Corporate training is driven by multiple factors and is often done via intranets and corporate portals. However, the students use the Internet as well. It has several variations, one of which is *on-demand online training*, which is offered by software companies such as Citrix Systems (**citrix.com**). However, in large corporations with multiple sites, and for studies from home, the Internet is used to access the online material. Vendors' success stories of online training and educational materials can be found at **adobe.com/resources/elearning** and at **brightwave.co.uk**. For a comprehensive guide to online training, see Kaattari and Trottier (2013).

Example

Dresser-Rand is a global US corporation that makes compression equipment. It has over 5500 employees in 50 different locations in 26 countries that speak 14 different languages. The company needs to do extensive training due to growth and employee retirement. Previously, the company used over 600 training vendors to conduct training. A major challenge was the update of the teaching material due to technological changes. Using the learning management system (LMS) from Coastal eLearning (**training.dupont.com**, now a part of DuPont Sustainable Solutions), the company deployed a comprehensive online training program via Dresser-Rand University, saving over $1 million per year. To read the case study, see **training.dupont.com/content/pdf/case-studies/dresser-rand-elearning-case-study.pdf**.

Using Computer Games for Training Current and New Employees

There is a trend to use computer simulation games for training.

Example

Marriott International developed a game "My Marriott Hotel," available on Facebook, for help in recruiting and training. The players learn how hotels and their restaurants operate. Initially, Marriott developed a game for the kitchen. The players needed to choose what ingredients to use for different foods (based on price and quality). The players also learned how to select employees from a pool of candidates and make decisions about equipment purchasing. They also learned about food quality.

For a free e-book on how gamification reshapes learning, see **elearningindustry.com/free-ebooks/gamification-reshapes-learning?pushcrew_powered**.

M-Learning

A special category of e-learning is **m-learning**, or mobile learning, which refers to e-learning, or other forms of education using mobile devices. Thus, one can learn at any place where a mobile device works. M-learning deals with communication and teaching in wireless environments. Special attention is given to situations where the instructors and the teaching materials are mobile. This technology enables learners to work and collaborate more easily than in offline situations. An example is Mobile Learn (**waldenu.edu/experience/learning/mobilelearn**), an online learning program offered by Walden University (**waldenu.edu**), an online university that extensively uses m-learning. Some offline universities are using mobile learning as well. One such university is Abilene Christian University (**acu.edu**); faculties are focused on using tablets for learning and teaching (see **legacy.acu.aem.host/technology/mobilelearning/**). For further details including case studies and resources, see **m-learning.org** and **en.wikipedia.org/wiki/M-learning**. See also a slide presentation titled "What is M-Learning" at **slideshare.net/aurionlearning/what-is-mlearning**.

Social Networks and E-Learning

Since its inception, social networking has been interrelated with learning. A new term, **social learning**, also known as *e-learning 2.0*, has been coined to describe the learning, training, and knowledge sharing in social networks and/or facilitated with social software tools. Social environments facilitate high-tech-based training, making it possible for learners to share their experiences with others. Thus, several companies already are using social media for training and development purposes (e.g., see **advancinginsights.com**). Social learning is based on *social learning theory*. For details, see **en.wikipedia.org/wiki/Social_learning_theory**.

Some students use Facebook, LinkedIn, Pinterest, Twitter, and so forth to connect with other pupils. For example, learners can study together, discuss topics, or brainstorm online. Unfortunately, the distractions found on some networks can make it difficult to focus on learning. Some companies use social media to engage employees in group learning via knowledge sharing.

According to News (2016), user-generated content which is a key property of social media is an important trend in corporate e-learning.

Several social networks (or communities) are dedicated to learning and training (e.g., see **elearning.co.uk**). An example of a social network for learning is TestDen or LearnHub (**getlearnhub.com**), which is dedicated to international education. Some scholars believe that the future of e-learning is social learning.

Social networking technology possesses the following capabilities that may facilitate learning:

- *Connect learners in a learning project.* It enables people to connect in real time for discussion, collaboration, and problem solving.
- *Make social part of the company's learning strategy.*
- *Build the know-how of experts.*
- *Enable learners to engage.* Generation X and millennial workers use Web 2.0 tools extensively for interacting among themselves and with others. Organizations can reach out to this group and use social networks for training.
- *Use platforms such as Pinterest to develop creativity in design and to use images to sharpen some learning skills.*
- *Provide relevant content prior to offline meetings for voting or requesting supplements.* This can enrich and facilitate classroom delivery.
- *Link learners to relevant resources and let them rate and share opinions.*
- *Quickly identify the training needs and implementation issues of individuals and groups.*
- *Have learners provide social support to each other.*
- *Improve and expedite learning-related communication (e.g., via Twitter).*

Many universities combine e-learning and social networking; additionally, numerous professors have blogs and wikis for their classes and encourage communication and collaboration via Facebook or other social networks.

Some Recent Technology Support of E-Learning

Several recent technology innovations are used to facilitate learning. Here is an example:

Example

SJI International School (Singapore) is using a social mobile platform to create a collaborative learning environment. The platform allows students and teachers to ask questions, discuss topics, share resources, and work collaboratively on projects. For details and the benefits attained, see Kwang (2016b).

Visual Interactive Simulation

An effective technology for e-training and e-learning is *visual interactive simulation* (VIS), which uses computer graphic displays to present the impact of evaluating alternative solutions to problems. It differs from regular graphics in that the user can manipulate the decision-making process and see the results of the interventions. Some learners respond better to graphic displays, especially when they are interactive. For example, VIS was used to examine the operations of a physician clinic environment within a physician network in an effort to provide high-quality medical care. The simulation system identified

the most important input factors that significantly affected performance. These inputs, when properly managed, led to lower costs and a higher level of medical care.

VIS systems provide the following major potential benefits:

- Shorten learning time.
- Aid in teaching how to operate complex equipment.
- Enable self-paced learning, any place, any time.
- Aid in memorization.
- Lower overall training costs.
- Record an individual's learning progress and improve on it.

Visual interactive simulation is closely related to virtual reality (Chap. 2).

Robotics, Chatbots, Telepreser, Robots, and More

Earlier in the chapter, we provided an example of robots which are used as instructors to teach English in Korea. Nowadays, robotics and other artificial intelligence techniques are extensively used to facilitate learning. For an overview, see Anderson (2016).

Using Chatbots

Chatbots are conversational robots (see Chap. 7) that people can communicate with in a natural language. According to Sujatha (2016), chatbots can be used for social interaction to facilitate learning. They are also used in simulation (simulator robots) and as a source of reinforcement.

Recent Technologies

Augmented reality, big data, gamification, personalized e-learning, and other recent technologies are presented by Anderson (2016). Also related is the use of e-learning in e-government (section "Digital Government: An Overview") and smart cities (Chap. 7), for an example, how e-learning is related to smart cities, see Akwaja (2017).

Virtual Assistants

These can be used as advisors to students and teachers. For the use of chatbots for the interface and knowledge base of wisdom, see Chap. 7. Virtual assistants play an increased role in e-learning.

A list of all learning-related chatbots, virtual assistants, conversational agents, and virtual agents, available as of 2016, is provided by **chatbots.org/applications/e-learning**. For a list of vendors and products (including AI based) for small businesses, see Beattie (2016).

E-Learning Management Systems

A **learning management system (LMS)** (also known as a course management system) consists of software applications for managing e-training and e-learning programs including content, scheduling, delivery tips, and so forth. Capterra Inc. Learning Management System Software (**capterra.com/learning-management-system-software**) and similar systems exhibit these capabilities:

- Provide effective student–instructor interactions
- Centralize and automate program administration
- Enable the use of self-service and self-guided e-learning services
- Create and rapidly deliver learning content modules
- Provide a single point of access to all e-learning online materials
- Help manage compliance requirements
- Consolidate training initiatives on a scalable Web-based platform
- Support the portability of systems
- Increase the efficiency and effectiveness of e-learning
- Personalize content and enable knowledge reuse

Many companies (e.g., Saba Software, Inc.; **saba.com/us/apps/learning-work**, SumTotal Systems; **sumtotalsystems.com**) provide methodologies, software, hardware, and consultation about e-learning and its management. For more on LMS, see **en.wikipedia.org/wiki/Learning_management_system** and watch the video titled "What is a Learning Management System?" (2:51 min) at **proprofs.com/c/category/lms**.

Note that it is possible to control what the students are doing when they self-study. For example, according to Streitfeld (2013), teachers can find out when students are skipping pages, not bothering to take notes, or failing to highlight significant passages.

One of the most effective tools for learning management is Blackboard Inc. (**blackboard.com**, now combined with WebCT). A brief description follows.

Example 1: Blackboard

Blackboard Inc. (**blackboard.com**) is the world's largest supplier of course management system software for educational institutions. How do Blackboard products work? A textbook publisher places a book's content, teaching notes, quizzes, and other materials on a Blackboard in a standardized format. Instructors can access modules and transfer them on to their university's Blackboard sites, which can be accessed by their students.

A professor can easily incorporate a book's content into Blackboard's software. As of 2009, Blackboard also delivers corporate and government employee training programs worldwide, which increases productivity and reduces costs. For details, see **blackboard.com** and **en.wikipedia.org/wiki/Blackboard_Inc**.

Example 2: Moodle

An alternative to Blackboard is a mostly free open source system called Moodle (see **moodle.org**).

For an example of how a vendor implemented a new suite of technologically advanced solutions into its cloud-based multichannel LMS, see Lechner (2016).

Electronic Books (E-Books)

An **electronic book (e-book)** is a book in digital format that can be read on a computer screen, on a mobile device, or on a dedicated device known as an *e-reader*. A major event in electronic publishing occurred in 2000, when Stephen King's book *Riding the Bullet* was published exclusively online. For $2.50, readers were able to purchase the e-book on Amazon.com and other e-book providers. Several hundred thousand copies were sold in a few days. However, hackers broke the security protection, copied the book, and distributed free copies of the book online. (See **bookbusinessmag.com/article/after-riding-bullet-12555/1#**.)

Publishers of e-books have since become more sophisticated, and online publishing has become more secure. Today there are several types of e-books that can be delivered and read in various ways:

- **Via a dedicated reader**. The book must be downloaded to an e-reader such as Amazon's Kindle.
- **Via Web access**. Readers can locate a book on the publisher's website and read it there. The book cannot be downloaded.
- **Via Web download and smartphones**. Readers can download the book to a PC.
- **Via a general-purpose reader**. The book can be downloaded to a mobile device such as an iPad or iPhone.
- **Via a Web server**. The contents of a book are stored on a Web server and downloaded for print-on-demand (which is discussed later in this book).

Most e-books require some type of payment. Readers either pay before they download a book from a website, such as buying a Kindle copy on Amazon.com, or they pay when they order the special CD-ROM edition of a book. Today, Amazon.com offers hundreds of thousands of e-books, e-newspapers (including international ones), and other digital products. All are cheaper than the hard copy version (e.g., new release books may cost $10 or less). There are many free e-books as well (e.g., **free-ebooks.net** and **onlinebooks.library.upenn.edu**).

Devices for Reading E-Books

The major device used to read an e-book is an e-reader. Most e-readers are lightweight (about 10 ounces) and are convenient to carry. The major e-readers and tablets are listed and compared at **the-ebook-reader.com**.

Several other aids are available to help readers who want to read a large amount of material online. For example, Microsoft ClearType (**microsoft.com/en-us/Typography/ClearTypeInfo.aspx**) and CoolType from Adobe (**adobe.com**) can be used to improve screen display, colors, and font sizes. Glowing screens can help you read in the dark (e.g., Kindle Touch and the Kindle Fire have a built-in light).

Combining E-Readers and Tablets

The trend today is to combine e-readers with tablet computers as was initiated with Amazon's Kindle Fire. The 7-inch portable devices allow people to read books, magazines, and documents and listen to audio books. Users can play games, listen to music, watch movies and TV shows, and much more. Kindle has Internet access via Wi-Fi, social network access, and e-mail is available also. Finally, with Amazon's Kindle Owner's Lending Library, Kindle owners who have Amazon Prime can choose from a selection of hundreds of thousands of books to borrow, for free, with no due dates.

Note: Tablet manufacturers also offer a combination of e-readers and tablets. The difference is that e-reader-based products such as Kindle Fire have less computing capabilities, while tablets such as iPad have a less capable e-reader and are more expensive.

Advantages and Limitations of E-Books

For e-books to make an impact, they must offer advantages to both readers and publishers. Otherwise, there would be little incentive to change from traditional books. Indeed, e-book sales are exploding due to the following advantages:

- Ability to store hundreds of books on a small mobile device. (External storage can hold much more.)
- Lower cost to buyers. The simple e-reader model costs less than $75; the tablet based costs less than $200.
- Searchable text—you can show links and connect easily to the Web.
- Instant delivery via downloads from anywhere. The tablet-based models provide you with many of the capabilities of other types of mobile computers.
- Portability—they go where you go.
- Easy integration of content from several sources.
- Durability—they are built stronger than a traditional book (but they can break if you are not careful). In addition, readers tend not to lose them (again, you need to be careful).
- Ability to enlarge the font size for easy reading and to add light if needed.
- Media rich (audio, color, video, etc.).
- Minimal cost for printing out a hard copy.
- Good readability in bright sunlight (ability to read books outdoors).
- Easy updating of content.
- Almost no wear and tear.
- Easy to find out-of-print books.

For additional benefits and advantage of e-books, see **successconsciousness.com/ebooks_benefits.htm**.

The primary advantage that e-books offer publishers is lower production, marketing, and distribution (shipment) costs, which have a significant impact on the price of books (e-textbooks are about 50% cheaper than print versions). Other advantages for publishers are the lower updating and reproduction costs, the ability to reach many readers, and the ease of combining chapters from several books to create customized textbooks, so professors can use materials from different books (usually by the same publisher) in one course.

Finally, the light weight of the tablet can eliminate the back pain that people, especially school children, have from carrying backpacks full of heavy books.

Of course, e-books have some limitations: They require hardware and software that may be too expensive for some readers; some people have difficulty reading large amounts of material on a relatively small computer screen; batteries may run out; and there are multiple, competing software and hardware standards to choose from, confusing the buyers. Several of these obstacles may lessen in time.

A Final Note: Is This the End of Printed Books?

According to Amazon.com, in 2011, the e-book sales on their site considerably exceeded the sales of hardcover and paperback books. (See **nytimes.com/2011/05/20/technology/20amazon.html**.) By 2014, e-book sales surpassed the sales of paper-based books (for all publishers). However, according to Nuwer (2016), e-book sales have plateaued.

Despite the limitations, e-books have become very popular, especially due to sophisticated e-readers. For example, even the Harry Potter books are now available in electronic format, and they are not encrypted, so that readers can move the books between mobile devices and even to a PC. For a comparison between e-books and printed books, see **thrall.org/docs/ebook-sandbooks.pdf** and **en.wikipedia.org/wiki/E-book**.

According to Alsever (2017), the $1 billion e-book industry is spawning a whole new ecosystem of businesses that serve the burgeoning world of digital publishing.

The question is: Will most printed books be eliminated? The trend is very clear. Sales of printed books are on the decline, while e-books are up. With Amazon's free loan of Kindle books to their prime members, we expect even more people reading e-books. Are paper books going to disappear? (See discussion by Vaughan-Nichols 2012.) For the advantages of e-books versus traditional books, see **online-bookstores-review.toptenreviews.com/the-advantages-of-ebooks-versus-traditional-books.html**.

SECTION 5.2 REVIEW QUESTIONS

1. Define e-learning and describe its drivers and benefits.
2. List some of the major drawbacks of e-learning and describe how they can be prevented.
3. Describe virtual universities and distance learning.
4. Define e-training and describe how it is done.
5. Describe the connection between e-learning, social networking, and mobile technologies.
6. List some e-learning tools, and describe Blackboard and visual interactive simulation (VIS).
7. How are robots, chatbots, and other artificial intelligence technologies used to facilitate e-learning?
8. Describe e-books.
9. What is an e-reader? What are its major capabilities?
10. List the major advantages and limitations of e-books to their users.

5.3 E-HEALTH

One of the major application areas of e-commerce is e-health.

Definition

The term has many definitions (Wikipedia reports about 51 of them). The *World Health Organization* (WHO) defines e-health as follows: "*E-health* is the transfer of health resources and healthcare by electronic means. It encompasses three main areas:

- The delivery of health information, for health professionals and health consumers, through the Internet and telecommunications
- Using the power of IT and e-commerce to improve public health services (e.g., through the education and training of health workers)
- The use of e-commerce and e-business practices in health systems management

The major concern of WHO (**telehealthcode.eu/glossary-of-terms.html**) is the efficient use of health resources for providing better and safer healthcare worldwide. E-health is an extremely broad field (see **en.wikipedia.org/wiki/Ehealth**). E-health is completely changing healthcare (see Elton and O'Riordan (2016)). For use of artificial intelligence in e-health, see Estopace (2016a). For the use of cloud computing in e-health, see Amazon Web Services Report (2016).

Here we cover only a few representative areas that are directly related to e-commerce.

Electronic Medical Record Systems (EMR)

One of the earliest applications of e-health was the electronic medical record system. The objective was to enable accessibility to patient medical records from any location, even from other cities and countries. With the spread of the Web, this application is growing rapidly. For example, one of the authors of this book can see the results of all his blood tests and certain medical records from any place at anytime, on the Web. Your doctor can pull the medical records whenever she or he needs to see them. One problem is the protection of privacy and assuring the appropriate use of data. In addition, there is an issue of accessibility to the medical records of patients by outsiders, such as researchers.

Doctors' System

Today doctors have immediate access to patient records. They can place orders directly to testing facilities (both internal and external). They can order medications directly from pharmacies, contact specialists, discharge patients in remote locations, and review results of tests from faraway locations. For many additional applications and for comprehensive coverage, see Wachter (2015).

Patient Services

A large number of patient services are available today due to advances in electronic medical record applications. Scheduling appointments from home, reading results of tests from anywhere and anytime are common. Patients enjoy better care due to the availability of Wi-Fi networks (see closing case in this chapter) that enable fast access to information by providers. For use of robots, see Anandan (2015). Patients can find a vast amount of information on hundreds of websites such as WebMD.com. They enjoy the advancements in medicine due to computerized systems. For comprehensive coverage, see Combs et al. (2016). For patient-centric uses of the Internet of Things (IoT) Chap. 7, see Bresnick (2015).

An interesting smartphone application during the 2016 Brazil Olympic was developed by the Brazilian government. It allowed the athletes to record their own health. For details, see Estopace (2016b).

Social Media and Commerce

The healthcare industry was a lagger in adopting social media and social commerce. However, as reported by Lawson (2015) and Mayo Clinic Center for Social Media (2012), this situation is changing. The healthcare participants are becoming actively engaged with one another. Patients report their experiences so others can learn. Doctors have their own professional social networks and other caregivers have similar networks. Medical portals, such as WebMD, disseminate information about many topics, inviting the public to comment. Many healthcare providers have a presence on Facebook, LinkedIn, and other social networks. Large numbers of bloggers provide their opinions on legal, medical, political, financial, and other related topics. One can find a lot of advice on what to eat, how to exercise, and what prescription medicine pills are good for you. Of course, there is extensive advertising all over the social media outlets. For a discussion, see Rogers (2014).

Medical Devices and Patient Surveillance

Large numbers of EC medical devices are used in the health industry. Some of the most well-known ones are robots that help in surgeries and sensors that monitor vital signs of patients and the location of handicapped patients. Considerable use of telecommunication is evidenced in medical facilities (see closing case in this chapter). Known as *telematics*, telemedicine information technologies are used to diagnose and treat diseases from the distance (e.g., in rural areas that have no doctors). A futuristic area is that of the *Internet of Things* (see Chap. 6), where many medical devices and sensors will be combined for new medical treatments. (See **healthitanalytics.com/news**.) A related area is patient monitoring (e.g., see Behr (2016)). For the use of the IoT, see a solution brief at **extremenetworks.com**.

Medical Research

Computer-assisted telecommunication provides access to medical knowledge and help in collaboration among researchers. Such collaboration may expedite new discoveries and save the lives of many patients. For an example of transmission of brain signals, see **enterpriseinnovation.net/article/ntu-develops-smart-chip-wireless-transmissions-brain-signals-1166441949**.

Administrative Purposes

Healthcare providers can save a lot of money by using e-commerce models such as e-procurement, group purchasing of supplies, advertising in social networks, recruitment with the help of LinkedIn and Facebook, and much more. For an example of medical schedules, see Zocdoc.com. Another example is the use of *predictive analysis* to predict which employees might get sick. Healthcare facilities can use B2B to make supply chain-related decision on medical supplies, saving a considerable amount of money (see Insitesoft (2015)).

A final note: A MIT robot helps deliver babies (see O'Brien (2016)).

SECTION 5.3 REVIEW QUESTIONS

1. Define e-health.
2. Describe EMR. Why is it important?
3. Describe social media and commerce in e-health.
4. Describe the major e-health applications in brief.

5.4 DIGITAL DISRUPTION AND SHARING ECONOMY MODELS: RIDE AND ACCOMMODATION SHARING

Digital disruption can take many forms having an impact on industries, companies, business processes, and individual people. In this section, we discuss some of the issues and strategies related to EC disruption and provide several examples, including ride sharing and accommodation sharing. In section "Person-to-Person Electronic Commerce Models", we will present more examples of disruption created by person-to-person EC models.

Digital Disruption: An Introduction

In Chap. 1, we briefly introduced the topic of **digital disruption** of which EC models are a major component. The examples of Amazon.com, Uber, and many other EC companies vividly illustrate how EC companies disrupt whole industries, Expedia and Priceline changed the travel reservation, and E* Trade and TD Ameritrade changed the stock brokerage business. Many more EC companies are doing (or try to do) just that.

Therefore, many businesses are concerned about the new disruptive technologies that threaten their operations, competitive edge, and even survival (e.g., see McCafferty (2016)).

For definition, examples, and discussion, see Poremba (2016). For successful examples, see the slideshow at **itbusinessedge.com/slideshows/9-successful-digital-disruption-examples-02.html**. For a guide to digital disruption, see Bradley and O'Toole (2016).

The disruptive force of e-commerce is discussed by Abcede et al. (2014). The authors describe the top relevant issues and discuss major impacts.

In addition to disrupting whole industries, EC can disrupt certain functions or business processes. For example, EC can change the manner in which customer service is delivered or the manner in which you pay for purchases.

Example: Customer Experience

One area where EC has been a major factor is the customer service experience. Mah et al. (2015) provide a report (as a part of *CMO Innovation Guide*) which shows how EC ("digital") disrupts and innovates the customer's experience (e.g., engagement, analytics, and mobile).

Disruptive technologies may pose a "do-or-die" challenge to many companies. When Starbucks saw decline in sales in 2014, it introduced a disruptive strategy, hoping to increase its sales.

Example: Starbucks Disrupts Its Own Marketing Strategy
Starbucks enabled its customers to make online reservations for lunches and dinners using smartphones. This changed the nature of the company from a coffeehouse to a diversified eatery. For details, see Beuker (2014).

Dealing with Disruptive Forces

Many experts are making suggestions of how to deal with digital disruptions. A comprehensive guide of how to handle such situations is provided by Bradley and O'Toole (2016) of McKinsey & Company (Management Consulting Company). The guide includes advice on how to transform businesses. The authors provide an example of a media company that added online classified ads to its business. In a few years, this addition was generating 80% of their earnings.

For more on how to harness the disruptive forces, see Beard (2016).

Disruptive Companies and Technologies

CNBC provides an annual list of 50 disrupting companies. The 2016 list (CNBC 2016) includes many EC companies (e.g., Uber, Ezetap, Airbnb, DAQRI, Snapchat, Teespring, and Venian). Gartner Inc. also provides an annual list of emerging disruptive technologies. Similar lists are provided by other consultants and technology magazines.

Sharing Economy

In Chap. 1, we introduced the concept of **sharing economy**, which may create some disruptive models and applications (e.g., see Kontzer (2016)). Also known as *collaborative consumption*, and *peer economy*, the concept is actually an umbrella term that covers multiple models, several of which are related directly to e-commerce. A list of sharing economy companies in the areas of food, travel, financial, mobility, travel, logistics, and others is available at **en.wikipedia.org/wiki/Sharing_economy**. In this section, we present two major models: ride sharing and accommodation sharing. In section "Person-to-Person Electronic Commerce Models", we cover the related models of person-to-person (also known as consumer-to-consumer). For a detailed overview, the driving forces, the benefits, and the criticism, see **en.wikipedia.org/wiki/Sharing_economy**.

Ride (Transportation) Sharing

Ride sharing has been around for several decades. People of the same workplaces and students have been using car sharing to save money or to free a family car for other members to use. However, only with the introduction of the smartphones, sharing becomes a mega business. Car sharing basically moved from collaborative commerce ("let's share a car to go to work") to B2C (contact Uber to arrange for a ride). The most impressive case is that of Uber, which despite legal and political obstacles has become a successful multibillion global enterprise. (See the closing case in Chap. 6.)

Example: GM and Lyft
GM provides cars to Lyft drivers (on a rental basis). The project started in Chicago where many potential drivers do not have cars. Called Express Drive, the project is moving to Boston, Washington DC, and Baltimore. Eventually, the cars will become in the future driverless. GM is part owner of Lyft. For details, see Lunden (2016).

In addition to Uber and its competitors, it is interesting to cite some similar ventures.

- Several car manufacturers are joining Uber, Lyft, etc., providing cars (e.g., electric, luxury) for the drivers.
- Ford and MIT University provide electronic cars to students to ride on the campus, on demand. Known as Dynamic Shuttle, the project explores the best way to provide secure and effective transportation to students. For details, see Etherington (2016).
- Explore Bike Share launched a nonprofit program for bike sharing in Memphis, Tenn. in July 2016. The program involved 600 bicycles in 60 stations. For details, see Risher (2016). Bike sharing is available in many cities worldwide.
- ZAPCAB (Chap. 1) pioneered an Uber-like system in Miami, New York, and Vermont. The company encounters several legal and political problems (in addition to disrupting the taxi business).
- In July 2016, Uber joined forces with its major competitor in China (see Young (2016)). Note that this venture has implications for the global competition of ride sharing since both companies compete in other countries.

Note: According to Mack (2017), if we all opt to ride sharing, our city streets would be transformed. But carpool apps could take 10,000 taxis off NY streets, creating unemployment problems.

Accommodation Sharing

With hotel fees mushrooming and shortages prevailing during peak seasons, travelers are seeking innovative reasonable priced accommodations. One solution is *home exchange* (swapping). The idea is simple: I am willing to let someone to stay free in my home while EI am travelling, in exchange of me staying free in that individual's home. There are several variations for how such exchanging is done (e.g., see Lagier (2014)).

Example: Home Exchange Co.
Home exchange is a global company, operating in over 150 countries. The company has (August 2016) 65,000 community members (each pays membership fees). Here is how it works (per **homeexchange.com/en/how-it-works**):

(a) Members list their homes. "Take a few minutes and list your house or your apartment so our Community can see it. Your home is unique. Show it off! Let our Community know what makes your Listing one-of-a-kind!"
(b) A vacation planning member searches for accommodation and exchange information. "It's easy: browse countless Listings for homes and locations you love, and use our simple messaging system to get in touch with those Members. Check our Inquiries sent to you from Members, and when you are ready, simply arrange your Exchange."
(c) An Exchange is finalized if a match is found. "Your Exchange can be anything you want it to be. Plan it on your time, travel where you want, on your schedule. Partner with like-minded Members to get everyone's ideal vacation. Travel your way and live like a local."

Several other companies exist (e.g., HomeLink House Exchange). For a guide, see **nomadicmatt.com/travel-tips/finding-cheap-accommodation**.

Free Home Sharing

If you do not have a home to exchange (e.g., you live with your parents or friends), you may try to find a free accommodation provided by someone who lives where you are going. Not only do you get a free bed, but you also can get local information and possibly make friends. Here are a few companies that can help you: Couchsurfing, Global Freeloaders, and Hospitality Club and Stay4Free (can also help with home swapping). For details and safety advice, see Nomadic Matt Inc. (**nomadicmatt.com**).

SECTION 5.4 REVIEW QUESTIONS

1. List some EC companies that disrupt their industries.
2. Describe ride sharing and its benefits.
3. List some issues in ride sharing.
4. List some variations of ride sharing.
5. How can people exchange accommodations?
6. How does home exchange work?

5.5 PERSON-TO-PERSON ELECTRONIC COMMERCE MODELS

Person-to-person (P2P) e-commerce, which is sometimes called consumer-to-consumer (C2C) EC, refers to electronic transactions conducted between and among individuals. These transactions can also include intermediaries, such as eBay (**ebay.com**), or social network sites or marketplaces, that organize, manage, and facilitate the P2P transactions. P2P activities may include transactions resulting from classified ads, music and file sharing, career and job matching (e.g., at **linkedin.com** and **careerone.com.au**), money lending (e.g., lendingclub.com), and personal matchmaking services (e.g., **match.com**).

P2P EC has given online shopping and trading a new dimension. Although this sort of trading is prevalent in the offline world (newspaper classified ads, garage sales, etc.), it was not expected to succeed online because of problems regarding

trust due to the anonymity of the traders, especially those who are in different locations. This problem was solved by using a third-party payment provider (e.g., **paypal.com**) and escrow or insurance services provided by eBay and others. One advantage of P2P EC is that it reduces the administrative and commission costs for both buyers and sellers. It also gives many individuals and small business owners a low-cost way to sell their goods and services by reaching many customers.

Social networks have become a popular place for P2P activities such as selling products and services via classified ads on **craigslist.org** or **facebook.com** and other social networks. People are sharing, bartering or selling music, bartering, selling virtual properties, and providing personal services.

E-Commerce: P2P Applications

Many websites facilitate P2P activities between individuals. We cover several representative applications next.

P2P Auctions

A very successful example of a P2P application is participation in auctions. In dozens of countries, selling and buying on auction sites is growing rapidly. Most auctions are managed by intermediaries (the most well-known intermediary is eBay). Consumers can visit auctions at general sites such as **ebay.com** or **auctionanything.com**, or they can use specialized sites. In addition, many individuals conduct their own auctions with the use of special software. For example, ProcurePort.com (see **procureport.com/reverse-auction-services.html**) provides software to create P2P reverse auction communities online.

Selling and Buying in P2P

In addition to auctions, eBay enables individuals to sell goods to other individuals at fixed prices. Amazon.com and Etsy (Chap. 3) do the same. Hundreds of other sites facilitate P2P trading, including those that use classified ads.

Peer-to-Peer Money Lending

The introduction of online money transfer enables the move of personal loans to the Web in what is called online *person-to-person or peer-to-peer money lending* or, in short, *P2P lending*. This model allows people to lend money and to borrow from each other via the Internet. For how P2P loan works, see **thebalance.com/a-quick-timeline-of-peer-to-peer-landing-985114**. Online File W5.3 provides overview of the logic of peer-to peer money lending.

Examples

Two pioneering examples are Zopa Limited in the United Kingdom (**zopa.com**) and Prosper Marketplace in the United States (prosper.com), which offer P2P online lending (see en.wikipedia.org/wiki/Zopa and **en.wikipedia.org/wiki/Prosper_marketplace**), respectively. Note that, despite the global credit crunch of 2008–2012 and the fact that neither has a government-backed guarantee, both Zopa and Prosper have been enjoying solid growth. For example, as of April 2014, Zopa's 50,000 active members had lent more than £528 million at negotiated rates to UK customers, mainly for car payments, credit card payments, and home improvement financing. The default rate of these P2P lenders is very low (e.g., Zopa's historical bad debt is 0.19% since 2010) since money is lent only to the most credit-worthy borrowers. For Prosper's company overview, see Online File W5.3 and **prosper.com/about**. To learn more about the topic, see an exhaustive review by Cunningham (2015) and Martin and Amy (2016).

Lending Club Is the Largest Commercial Marketplace for P2P Lending

It is registered on the New York stock exchanges, and it also uses institutional investors as sources of funding. Yet, it has several problems that slow the development of the P2P lending business; see Application Case 5.1 for details.

CASE 5.1: EC APPLICATION THE LENDING CLUB CORP.

The Lending Club Corp. (LC) is the world's largest P2P lending platform. The company claims that $22 billion in loans had been originated through its platform up to January 15, 2017, of which about $2 billion funded in the last quarter of 2016. It was the first P2P lender to register with the SEC. For the history of LC, see Davidson (2013).

The Business Model

According to **lendingclub.com/about-us-action** and **en.wikipedia.org/wiki/lending-club**, Lending Club enables borrowers to create "loan needed" listings on its website by supplying details about themselves and the loans that they would like to obtain. All loans are unsecured personal loans and can be between $1000 and $40,000. On the basis of the borrower's credit score, credit history, desired loan amount requested, and the borrower's debt-to-income ratio, Lending Club determines whether the borrower is *credit worthy* and assigns to its approved loans a credit grade that determines payable interest rate and origination fees. The standard loan period is 3 years.

Investors can browse the "loan listing needed" on Lending Club website and select loans that they want to invest in, based on the information supplied about the borrower, amount of loan, loan grade, and loan purpose. The loans can only be chosen at the interest rates assigned by Lending Club, but investors can decide how much to fund each borrower.

The Revenue Model

Investors make money from interest. Rates vary from 6.03% to 26.06%, depending on the credit grade assigned to the loans. Lending Club makes money by charging the borrowers an origination fee and the investors a service fee. The size of the origination fee depends on the credit grade, and it ranges 1.1–5.0% of the loan amount. The size of the service fee is 1% on all amounts the borrower pays. The company facilitates interest rates that are better for lenders and borrowers than they would receive from (or pay to) most banks.

Note: Because lenders are making personal loans to individuals, their gains are taxable as personal income, instead of investment income (i.e., they pay more tax).

The Secondary Market

The investors have the ability to place the unsecured notes they receive from LC for sale before the notes have reached maturity. This service is offered in a partnership with FOLIOfn Investments which charges a 1% fee on note sales, making Lending Club the first peer-to-peer lending network to offer a secondary market for peer-to-peer loans.

Problems Faced by Lending Club

During its first year, LC grew very fast, added business partners, and involved financial institutions (e.g., hedge funds) in its operation. Then a slew of problems emerged that resulted in the stock price to lose over 80% of its value, its CEO left, and the SEC launched an investigation of the business. The SEC realized that individual lenders have no experience in assessing credit risk nor they have access to information that a bank does. The borrowers and the lenders depend on what they are told by LC. LC itself aims to take no risk, selling the loans to others. In short, the P2P lending business pushes loan volume at the expense of credit equity. Therefore, some argue that LC troubles show why P2P does not work (e.g., see Hutchinson (2016)). For more about LC problems, see Chafkin and Buhayar (2016).

Finally, delinquencies of borrowers climbed in recent years. As a result, LC tightened its credit and increased its fees and interest rates (per Buhayar (2016)).

Conclusion

Despite all the problems, LC is alive and growing. The quality measures resulted in losses in 2016. But its share price is slowly climbing, and financial analysts are willing to wait rather than recommend to sell the shares of LC.

Sources: Compiled from Buhayar (2016), **en.wikipedia.org/wiki/Lending_Club**, Chafkin and Buhayar (2016), and **lendingclub.com**.

Questions

1. It is said that "LC is a kind of eBay for loans." Discuss.
2. Search information about the SEC investigation. Write a report.
3. Find the B2B activities on the site.

4. Compare LC with Funding Circle in the United Kingdom. Write a report. (See Lunden (2017).)

A word of caution about virtual banking, including P2P lending: Before sending money to any company, especially one that promises high interest rates for your deposits, make sure that the service is a legitimate one.

Selling via Classified Ads

Internet-based classified ads have several advantages over newspaper classified ads. They cover a national, rather than a local, audience and can be updated quickly and easily. Most of them are free to sellers and buyers or they charge very little. This greatly increases the supply of goods and services available and the number of potential buyers. One of the most successful sites of C2C classified ads is **craigslist.org** as seen in Chap. 2. Classified ads also include apartments for rent and real estate for sale across the United States (powered by **forrent.com**). **Freeclassifieds.com** allows you to buy or sell anything for free. Many newspapers also offer their classified ads online. In some cases, placing an ad in the classified section of one website automatically directs it into the classified sections of numerous partners (known as cross posting).

Classified ads appear on thousands of websites, including popular social networks such as **facebook.com/PostFreeAdsToday** and **linkedin.com**.

Personal Services Online

Numerous personal services are available on the Internet (lawyers, handy helpers, tax preparers, investment clubs, dating services). Some are located in the classified ad section, but others are listed on specialized websites (e.g., **hireahelper.com**) and directories. Some are offered free; others charge a fee.

Note: Be very careful before looking for any personal services online. Fraud or crime could be involved (e.g., a lawyer online may not be an expert in the area professed or may not even be a lawyer at all).

Vacation (Short-Term) Rentals

Vacation rentals are short-term rentals offered usually by individuals who own a rental unit or an extra room. The offers can be significantly lower than hotels. Renters can also get a one or two bedroom units, living room, and a kitchen. Vacation rentals are very popular in Hawaii and other vacation areas. E-commerce offers a mechanism that connects sellers and buyers, i.e., people that want to provide accommodations with travelers. In the past, the communication mode was classified newspapers and telephone. EC offers an efficient, fast, and safer mode that supports such transactions. The most well-known name in 2016 is Airbnb (see Application Case 5.2). Other companies are Wimdu, Roomorama, and HomeAway.

CASE 5.2: EC APPLICATION AIRBNB: AN E-COMMERCE DISRUPTION IN THE HOSPITALITY INDUSTRY

Airbnb is a portal that connects travelers with local hosts that provide lodging. This lodging can include single or shared rooms, suites, or entire apartments/houses. The firm acts as an intermediary and matches travelers with hosts for a fee. Customers enjoy using the service because it is often less expensive than traditional hotels and can provide greater flexibility in the type of lodging being provided. The company was founded in 2008 and has quickly grown to over 190 countries and more than 34,000 cities worldwide (see **nextjuggernaut.com/blog/airbnb-business-model-canvas-how-airbnb-works-revenue-insights**).

Many consider Airbnb's growth to be quite significant, with a revenue growth of 113% between 2014 and 2015 (see **skift.com/2016/05/03/state-of-travel-2016-airbnb-vs-hotel-rivals-in-6-charts**). And while the company is still private, some put its value at up to $30 billion (see **bloomberg.com/news/articles/2016-06-28/airbnb-seeks-new-funding-at-30-billion-valuation**). This growth began in the United States, but international expansion has a dwarf rows domestically (see **growthhackers.com/growth-studies/airbnb**). Currently only 16% of the company's bookings are in the United States. The fastest-growing host cities for Airbnb are primarily in Asia with other strong growth in Europe (Taylor 2016).

One major question about this growth is if it is dislodging travelers from traditional hotels and if so how much. It is difficult to evaluate all of the potential impacts on hotel occupancy rates and with it the possible impact of Airbnb. While Airbnb rentals are significant, they are small compared to the annual use of hotels in the United States. Many are analyzing this issue and attempting to determine the effect this may have on the lodging industry as a whole (Salvioni 2016).

This growth has not been without challenges. One issue that potential hosts must contend with is the potential for their lodging to be damaged. Because these hosts do not have insurance that is typical of a hotel, these damages may not be covered (see **mashable.com/2015/04/30/house-destroyed-airbnb-renters/#ztIl4rFrFiqm**). To address these concerns, the company is working on systems to better vet potential renters as well as providing some relief to hosts.

Another issue is the legality and regulatory requirements for Airbnb itself. Many localities view Airbnb as they would a traditional hotel or hostel. This may be because the laws currently on the books are not created with this business model in mind. In any case, the company is spending large sums of money and has engaged many employees to work with municipalities to clarify laws and their enforcement as it relates to the company (Taylor 2016).

A major issue for Airbnb and similar companies is taxation. For example, in New York City, there is an accommodation tax of 17%. In 2016, Airbnb agreed to collect money from the renters and pay the fees to the city.

Questions

1. What factors have allowed Airbnb to grow as rapidly as it has?
2. Will Airbnb disrupt the traditional lodging industry?
3. What can renters and hosts do to protect themselves when using Airbnb?
4. Select a city that you would like to travel to. Compare the cost of a traditional hotel (Travelocity.com) to the cost of an Airbnb host (Airbnb.com).

File-Sharing Utilities: Napster and Others

It all started in 1999. By logging onto services such as Napster, people were able to download files that others were willing to share for free. Such *P2P networks* enabled users to search other members' hard drives for a particular file, including data files created by users or copied from elsewhere. Digital music and games were the most popular files accessed. Movies, TV shows, and videos followed shortly thereafter. Napster had over 60 million members in 2002 before it was forced to stop its service due to copyright violations.

The Napster server, and others that followed, functioned as a directory that listed the files being shared by other users. Once logged onto the server, users could search the directory for specific songs and locate the file's owner. They could then directly access the owner's computer and download the songs they had chosen. Napster also included chat rooms to connect its millions of users.

However, a US federal court found Napster to be in violation of copyright laws because it enabled people to obtain music files without paying royalties to the creators of the music. Following this ruling, in March 2002, Napster was forced to shut down and filed for bankruptcy. In 2011, Napster was acquired by Rhapsody (**rhapsody.com**), a subscription-based music downloading site. For a history of Napster, see **theguardian.com/music/2013/feb/24/napster-music-free-file-sharing**. Note: Napster is an independent unit now.

A number of free file-sharing programs still exist. For example, an even purer version of P2P is BitTorrent (**bittorrent.com**), software that makes downloading files fast. To access games over P2P networks, try TrustyFiles (**trustyfiles.com**). Despite the temptation to get "something for nothing," remember that downloading copyrighted materials for free is usually against the law.

P2P Activities in Social Networks and Trading Virtual Properties

P2P activities in social networks include the sharing of photos, videos, music, and other files, trading of virtual properties, and conducting other activities. Trading virtual properties is discussed in Chap. 8.

SECTION 5.5 REVIEW QUESTIONS

1. Define P2P e-commerce.
2. Describe the benefits of P2P e-commerce to all participants.
3. Describe the major e-commerce P2P applications.
4. Describe P2P lending.
5. Describe P2P vacation rentals.

6. Define file sharing.
7. Describe file sharing and the legal issues involved.

MANAGERIAL ISSUES

Some managerial issues related to this chapter are as follows:

1. **How do we design the most cost-efficient government e-procurement system?** Several issues are involved and questions may be raised in planning e-government: How much can the governmental e-procurement system save on procurement costs? How can the system be used for procuring small quantities? How do you deal with bidders from outside your country? How can illegal bribery be prevented? What criteria besides cost need to be considered? How should the online and offline procurement systems be designed? How do you advertise RFQs online? How should the portfolio of auctions and desktop purchasing be constructed? Can the government use commercial B2B sites for procurement? Can businesses use the government procurement system for their own procurement? All these must be considered in an effective design.
2. **How do we design the portfolio of e-learning knowledge sources?** There are many sources of e-learning services. The e-learning management team needs to design the portfolio of the online and offline training applications and the internal and external knowledge sources (paid and nonpaid sources). The internal knowledge management system is an important source of training materials for large corporations, whereas external sources could be more cost-effective for small organizations. Obviously, justification of each item in the portfolio is needed, which is related to vendor selection. For illustrative case studies, see **brightwave.co.uk**.
3. **How do we incorporate social networking-based learning and services in our organization?** With the proliferation of social networking initiatives in the enterprise comes the issue of how to integrate these with the enterprise system, including CRM, KM, training, and other applications and business processes. One issue is how to balance the quality of knowledge with the scope of knowledge in e-learning and training programs.
4. **What will be the impact of the e-book platform?** If the e-book is widely adopted by readers, the distribution channel of online book sales may be disruptive. This new platform may cannibalize the offline book retail business. Additionally, there is the need for the protection of intellectual property of digital contents since it is easy to copy and distribute electronic files (see Online Chap. 12). In general, more e-books will be published and read.
5. **How to recognize a digital disruption?** It depends, but usually a disruption may drive some businesses to lose market share or they end in a bankruptcy. Many times the disruption will be covered by the media and changes in stock prices. Several conferences and management consultants call attention to industry disruptions.
6. **What is the impact of ride sharing?** Ride sharing usually benefits riders by cutting costs. It disrupts the taxi business and may result in political, legal, and social changes.
7. What is the future of P2P commerce? It certainly going to increase in areas such as money lending, marketing of arts and crafts, and delivery of services such as accommodation. It is clearly a disruptor in the hospitality field.

SUMMARY

In this chapter, you learned about the following EC issues as they relate to the chapter's learning objectives:

1. **E-government activities.** Governments, like any other organization, can use EC applications for great savings and increased effectiveness. Notable applications are e-procurement using reverse auctions, e-payments to and from citizens and businesses, auctioning of surplus goods, and electronic travel and expense management systems. Governments also conduct electronic business with other governments. As a result, governments can do a better job with less money.
2. **Implementing e-government to citizens, businesses, and its own operations.** Governments worldwide are providing a variety of services to citizens over the Internet. Such initiatives increase citizen satisfaction and decrease government expenses for providing citizens' service applications, including electronic voting. Governments also are active in electronic trading with businesses. Finally, EC can be conducted within and between governments. E-government's growth can be strengthened by the use of wireless systems in what is described as mobile or m-government. In addition, e-government 2.0 is becoming increasingly popular with tools such as wikis, blogs, social networks, and Twitter.

3. **E-learning and training.** E-learning is the delivery of educational content through electronic media via the Internet and intranets. Degree programs, lifelong learning topics, and corporate training are delivered online by thousands of organizations worldwide. A growing area is distance learning via online university offerings; and virtual universities are becoming quite popular. Some are virtual; others are delivered as a combination of online and offline offerings. Online corporate training is increasing also and is sometimes conducted at formal corporate learning centers. Implementation is done in steps starting with just an online presence and ending with activities on social networks. New e-readers contain easy-to-read text, search capabilities, rich media, as well as other functions. Add to this the low cost of e-books and the capability of storing hundreds of books on a single e-reader, and you can understand the increased popularity of these devices.
4. **E-books and their readers.** There is an increased interest in e-books due to their many benefits (Amazon.com sells more e-books than hardcover ones). There is intense competition among e-reader and tablet manufacturers, and the products' capabilities are increasing while their prices are declining. E-books are used both for pleasure reading and for studying. E-books can be read on several portable devices including tablets.
5. **E-health.** E-commerce, m-commerce, and social commerce applications are increasingly penetrating the healthcare field. Practically, B2B, B2C, c-commerce, and even P2P services are practiced all over the world. The most well-known is the electronic medical record area that helps in rapid care and accessibility in rural areas. Another well-known area is patient care applications ranging from monitoring patients 24/7 to improving medical testing, enabling the use of better medical equipment, and increasing patients' satisfaction and comfort. Patients' education is greatly facilitated by using medical portals. Physicians have rapid access to all data they need and they can transmit orders electronically.

   Social media and networks assist patients and administrators in many ways and foster sharing and collaboration. Other areas that benefit from e-commerce are medical services acquisition, maintenance, and use. Many administrative processes and medical research are supported by EC. However, a major problem in e-health is the protection of patients' medical records and privacy.
6. **Digital disruption and sharing economy.** E-commerce sharing economy models such as ride sharing are a major source of digital disruption, which may impact entire industries, companies, business processes, and/or people. Sharing economy models such as ride sharing and accommodation sharing are becoming popular. There is a variety of other models. The models save money to those who share. Current issues relate to taxation and security.

   P2P activities. P2P consists of individual consumers conducting e-commerce with other individual consumers, mainly in auctions (such as at eBay), classified ads, matching services, and specialty webstores at eBay and Etsy. Also, there are illegal file-sharing activities of music, videos, and games (see Chap. 15).

5.6 KEY TERMS

Digital disruption
Distance learning
E-government
E-health
E-learning
Electronic book (e-book)
Government 2.0
Government-to-business (G2B)
Government-to-citizens (G2C)
Government-to-employees (G2E)
Government-to-government (G2G)
Learning management system (LMS)
Mobile government (m-government)
M-learning
Person-to-person (P2P)
Shared economy
Social learning (e-learning 2.0)
Virtual universities

DISCUSSION QUESTIONS

1. Discuss the advantages and disadvantages of e-government using social networking versus the traditional e-government portal.
2. Discuss the advantages and shortcomings of e-voting.
3. Discuss the advantages and disadvantages of e-books.
4. Discuss the advantages of e-learning in the corporate training environment.
5. Discuss the advantages and disadvantages of ride sharing.
6. Find information about the disruption force of e-commerce.
7. Discuss the critical success factors of Airbnb and similar companies.
8. Discuss why disruption may create do-or-die situation.
9. Summarize the legal problems of Uber and other ride-sharing companies.
10. Some say that B2G is simply B2B. Explain.
11. Compare and contrast B2E with G2E.
12. Which e-government EC activities are intrabusiness activities? Explain why they are categorized as intrabusiness.
13. Identify the benefits of G2C to citizens and to governments.
14. Discuss the improvements in healthcare provided by e-commerce.
15. Discuss the potential impacts of AI on e-government and e-health.

TOPICS FOR CLASS DISCUSSION AND DEBATES

1. Discuss the advantages and disadvantages of e-learning for an undergraduate student and for an MBA student.
2. Discuss the benefits of using e-commerce in the healthcare field. What are the limitations? The disadvantages?
3. One of the major initiatives of many governments (e.g., European Commission) is Smart Cities (see Chap. 6 for the technology). Discuss the content of such initiatives and explain why they are a part of e-government.
4. Uber China and Didi merge their operation in China, but work separately, as competitors in several other countries. Find recent information about the relationship between the two companies.
5. Provide examples of business processes which are disrupted by e-commerce.
6. What industries, companies, and business processes were disrupted by e-commerce?
7. The valuation of Airbnb went from $5B to $30B in a year (July 2015 to Aug. 2016). Is this realistic? Debate.
8. Some consider crowdsourcing and crowdfunding to be examples of sharing economy models; others disagree. Debate.
9. Debate: E-books will replace traditional books.
10. Debate: Analyze the pros and cons of electronic voting.
11. Enter **en.wikipedia.org/wiki/E-Government** and find the "controversies of e-government" section. Discuss the advantages and disadvantages. Write a report.
12. Debate the issue: Is e-learning really working?
13. Discuss the content and benefits of the UN E-Government Development Database (**unpan3.un.org/egovkb**).
14. Debate the issue of electronic vs. manual voting.
15. Debate the value of robo-advisors in e-government and e-health.

INTERNET EXERCISES

1. Enter **e-learningcentre.co.uk**, **elearnmag.acm.org**, and **elearningpost.com**. Identify current discussion issues and find two articles related to the effectiveness of e-training. Write a report. In addition, prepare a list of the resources available on these sites.
2. Enter **adobe.com**, and find the tutorials and tools it offers for e-learning, knowledge management, and online publishing. Prepare and give a presentation on your findings.
3. Enter **blackboard.com** and also view **en.wikipedia.org/wiki/Blackboard_Inc.**. Find the major services provided by the company, including its community system. Write a report.

4. Enter **fcw.com** and read the latest news on e-government. Identify initiatives not covered in this chapter. Then enter **gcn.com**. Finally, enter **egovstrategies.com**. Compare the information presented on the three websites.
5. Enter **lendingclub.com** and find their revenue model.
6. Imagine you are going to New Zealand. Find free accommodation there. Summarize your experience.
7. Investigate **airbnb.com**. Identify factors that give them a competitive advantage.
8. Enter **stay4free.com**. Examine their "true free" and "for free" services.
9. Enter **en.wikipedia.org/wiki/Sharing_economy** and read about the various types of collaborative consumption. In addition, prepare a summary of the driving forces and the benefits.
10. Enter **procurement.org** and **govexec.com**. Identify recent e-government procurement initiatives and summarize their unique aspects.
11. Enter **amazon.com**, **barnesandnoble.com**, and **sony.com**, and find the latest information about their e-readers. Compare their capabilities and write a report. (Consult **the-ebook-reader.com**.)
12. Enter **chegg.com** and similar sites that are learning platforms. Explain what they do.
13. Find two companies that enable C2C (or P2P) e-commerce (such as **egrovesys.com**). Comment on their capabilities.
14. Find successful examples of e-government. Start by posing questions on **quora.com**.
15. Will P2P profoundly transform traditional banking over the next decade? Debate.
16. Debate the pros and cons of ride sharing and its impact on the taxi industry.

TEAM ASSIGNMENTS AND PROJECTS

1. Read the opening case and answer the following questions:

   (a) What drives the e-government in Estonia?
   (b) What were the major critical success factors?
   (c) Given the hacking situation, does the idea of using the Internet for vote in Estonia make sense?
   (d) Enter **e-estonia.com/case_study**, and list all the cases. View the videos of three cases and summarize their contents.

2. Conduct a comparative study on e-government in the following countries:

   (a) Denmark (start with **egov_in_denmark_-_17_0_final.pdf**).
   (b) New Zealand (start with **ict.govt.nz**).
   (c) Singapore (start with **centreforpublicimpact.org/case-study/building-digital-government-singapore**).

   Assign teams to each country. Identify the critical success factors and the special feature of each country. Make a presentation.

3. Create four teams, each representing one of the following: G2C, G2B, G2E, and G2G. Each team will prepare a description of the activities in the assigned area (e.g., G2C) in a small country, such as Holland, Denmark, Finland, or Singapore. A fifth team will deal with the coordination and collaboration of all e-government activities in each of the four countries chosen. Prepare a report.
4. Find newer trends. Explore each of the trends and find examples of how governments deal with these trends. Compare to findings of the UN E-Government Survey of 2016. Prepare a class presentation.
5. Find information about strategies for dealing with disruptions that may endanger your company. Write a summary.
6. Research the relationship between disruption and innovation.
7. Ride sharing disrupts the taxi business. Find information regarding action taken by taxi drivers to deal with the competition.
8. Both Ford and Volvo are working with Uber to offer self-driving cars. Find the status of this and similar projects (e.g., GM and Lyft). Prepare a report. Outline the potential benefits to all participants including renters.
9. Review the list of 50 disruptors provided by CNBC (2016) and identify the EC-related companies (in addition to Uber, Lyft, Pinterest, and Airbnb). Briefly explain why each is an e-commerce company.
10. Research the viability of P2P money lending. Start with the Lending Club Company.

11. View the video "E-Learning Debate 2010 – Highlights" (4:51 min) at **youtube.com/watch?v=Q42f1blFnck**. Debate the pros and cons regarding the value of e-learning.

    (a) List all the pro and con statements from the video.
    (b) For each statement, have two teams (or individuals) explain why each agrees or disagrees with the statement.
    (c) Add several pro and con statements from what you learned in class or discovered on the Web.
    (d) For each added statement, have two teams (or individuals) explain why each agrees or disagrees with the statement.
    (e) Jointly prepare a summary. The use of a wiki is advisable.

12. Have each team represent one of the following sites: **netlibrary.net** and **ebooks.com**. Each team will examine the technology, legal issues, prices, and business alliances associated with its site. Each team will then prepare a report answering the question, "Will e-books succeed?" (Read Nuwer (2016).)

CLOSING CASE: HENRY FORD HEALTH SYSTEM PROVIDES SUPERIOR PATIENT EXPERIENCE USING IT AND E-COMMERCE

Henry Ford Health System (HFHS) is a comprehensive health system that provides care to 2.2 million patients annually in Metro Detroit and several other cities. The HFHS complex includes 5 medical centers and 24,000 employees.

The Challenges

The system's mission is to support the communication and collaboration of the mobile employees, patients, insurers, physicians, visitors, and vendors and to assure the operation of the many mobile biomedical devices. HFHS needed a massive electronic network. Furthermore, it was necessary to support the patient data flow, some of which is in real time (data accessibility at point of care). All this required continued availability with protection of privacy and security. The challenges include the support of a multitude of mobile devices that patients and visitors bring with them. In addition, the mobile and biomedical devices are from many manufacturers and are used for many applications (e.g., x-ray carts, IV pumps, mobile ultrasound, EKG machines, etc.). Parts of the medical facilities are within 6-foot concrete walls, which made radio-frequency (RF) penetration difficult. The hospital needed a wall-to-wall coverage by wireless connection that would work without interferences and enable a large volume of wireless traffic.

The Solution

HFHS decided to install an advanced Wi-Fi system. This required experimentation with different software and hardware and with the locations and numbers of Wi-Fi access points.

The resultant solution enabled the integration of over 3500 biomedical devices into the Wi-Fi network. This required collaboration with those that are purchasing the devices. To support the wireless, it was necessary to bring access point antennas in over 90 elevators and many stairway corridors (a multiple year project). The solution also included penetration of information flow in lead walls and through 6-foot concrete shelters. In addition, the solution enabled connecting with the many brands of mobile devices belonging to patients and visitors. The system covers over 60 sites of HFHS in many locations. Overall, more than 7 million square feet of facilities are covered. In 2016, there were over 3200 access points and 1200 security sensors. In addition to the Wi-Fi, the HFHS is using several e-commerce information systems such as Philips' CareSage predictive analytics and 3M 360 Encompass system.

The Results

The success of Wi-Fi was featured in a best practice article in the "Association for the Advancement of Medical Instrumentation." Patient satisfaction has increased drastically and so has the productivity and quality of the hospital's employees and the physicians. The networks also enable members of the community to access the educational material disseminated by the hospital. The Wi-Fi enables the biomedical devices to operate smoothly, to enable safe access to all needed information, and to facilitate communication, collaboration, and teamwork. All these were done while meeting all compliance requirements.

Sources: Based on Extreme Networks (2016) and Philips Media (2016)

Questions

1. Why was Wi-Fi the only reasonable solution?
2. Why was this project so complex?
3. What are the major benefits? To whom?

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