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| Solutions – Chapter 1 |

***Critical Thinking Exercise***

*Kroger’s QueVision System Improves Customer Service*

*Review Questions*

1. The QueVision system is an enterprise system.
2. The two components that are missing are well-trained workers and better teamwork.

*Critical Thinking Questions*

1. To address the concerns of the cashiers and baggers, the store manager should observe the checkout process and performance of cashiers and baggers for a few days before taking action.
2. The manager should identify and put into place the full set of organizational complements. This cannot be done without observing where the system is failing.

***Critical Thinking Exercise***

*NARCOMS Database to Aid MS Victims*

*Review Questions*

1. Fundamental hardware components that are likely included in the NARCOMS systems might include keyboards, mice, servers, hard drives, monitors or displays, routers, switches, hubs, modems, printers, etc. A variety of equipment to provide input, processing, storage, and output activities, as well as networking and mobile hardware are likely included.
2. For the total 100,000 target number of participants the maximum database size would be 0.05 gigabytes assuming each record contained a maximum of 500 bytes. This would not be considered a big data project.

*Critical Thinking Questions*

1. Student responses may vary. Three reasons why most do not participate might include: concerns over privacy and sharing of personal medical information; unable to complete a survey due to either limited mobility or lack of resources; and not knowing that this database exists.
2. Student responses may vary. One course of action might be introducing the database to patients receiving a diagnosis of MS and then offering help with the surveys during doctor visits.

***Critical Thinking Exercise***

*Business Analytics for Gaming Firm*

*Review Questions*

1. Business analytics can be defined as the extensive use of data and quantitative analysis to support fact-based decision making within organization.
2. Data scientists understands the business and business analytics technology while also recognizing the limitations of their data, tools and techniques. They put all of this together to deliver real improvements in decision making within an organization.

*Critical Thinking Questions*

1. Student responses may vary. Three data sources might include customer surveys, a players’ card, or historical hotel records.
2. Student responses may vary. Some customers may want to enjoy the benefits offered from a player’s card, for example, but may not be comfortable with the card tracking their gambling history.

***Critical Thinking Exercise***

*Strategic Plan Review*

*Review Questions*

1. Hallmarks of a good strategic plan could include a clarity of purpose, having well-defined goals over a specified period of time, focusing energy and resources and strengthening operations.
2. More funds would be allocated to system development over buying existing software and using software service providers. The cost to build a system can be very high and, even small projects, take a significant amount of time.

*Critical Thinking Questions*

1. Student responses may vary. You may want to become more familiar with the day-to-day activities and challenges in the IS organization.
2. Student responses may vary. You may want to meet with key stakeholders in the IS organization to get their input on the strategic plan and budget.

***Critical Thinking Exercise***

*Robo-Advice for Millennials*

*Review Questions*

1. The insurance industry might benefit from the use of a robo-advice system.
2. Students answers will vary. As far as ethics are concerned, a robo-advisor will always lack the ethical judgement of a human being. In the case of the investment firm, the robo-advisor lacks the ability to hold the investor accountable to a budget or to encourage the saving of an emergency fund before investing. The builders of such systems should make consumers aware of potential pitfalls of using the system.

*Critical Thinking Questions*

1. Student responses may vary. An alternate strategy could be for the robo-advice service to work in conjunction with a professional financial planner. The firm might use a call system where investors can discuss the results of the robo-advice system with a human to help decide if the given advice is the best course of action.
2. Student responses may vary. You might want to have the members of senior management try out the service for themselves, or see the service in action with a real customer.

***Review Questions***

1. Data is the raw material from which information is composed. Information includes a context for the data. Knowledge is an awareness of how to apply the information.
2. The student can list any six of the following attributes that describe the quality of data:

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| **Characteristics** | **Definitions** |
| Accessible | Information should be easily accessible by authorized users so they can obtain it in the right format and at the right time to meet their needs. |
| Accurate | Accurate information is error free. In some cases, inaccurate information is generated because inaccurate data is fed into the transformation process. This is commonly called garbage in, garbage out (GIGO). |
| Complete | Complete information contains all the important facts. For example, an investment report that does not include all important costs is not complete. |
| Economical | Information should also be relatively economical to produce. Decision makers must always balance the value of information with the cost of producing it. |
| Flexible | Flexible information can be used for a variety of purposes. For example, information on how much  inventory is on hand for a particular part can be used by a sales representative in closing a sale, by  a production manager to determine whether more inventory is needed, and by a financial executive  to determine the total value the company has invested in inventory. |
| Relevant | Relevant information is important to the decision maker. Information showing that lumber prices might drop is probably not relevant to a computer chip manufacturer. |
| Reliable | Reliable information can be trusted by users. In many cases, the reliability of the information depends on the reliability of the data-collection method. In other instances, reliability depends on the source of the information. A rumor from an unknown source that oil prices might go up may not be reliable. |
| Secure | Information should be secure from access by unauthorized users. |
| Simple | Information should be simple, not complex. Sophisticated and detailed information might not be needed. In fact, too much information can cause information overload, whereby a decision maker has too much information and is unable to determine what is really important. |
| Timely | Timely information is delivered when it is needed. Knowing last week’s weather conditions will not help when trying to decide what coat to wear today. |
| Verifiable | Information should be verifiable. This means that you can check it to make sure it is correct, perhaps by checking many sources for the same information. |

1. An information system is a set of interrelated elements or components that collect (input), manipulate and store (process), and disseminate (output) data and information and provide a feedback mechanism to meet an objective. In information systems, feedback is information from the system that is used to make changes to input or processing activities.
2. The components of computer-based information system (CBIS) include hardware, software, databases, networks, people, and procedures.
3. A business’s technology infrastructure includes all the hardware, software, databases, telecommunications, people, and procedures that are configured to collect, manipulate, store, and process data into information. The technology infrastructure is a set of shared IS resources that form the foundation of each computer-based information system.
4. The three types of information systems are as follows:

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| **Type** | **Description** |
| Personal IS | An information system that improves the productivity of individual users in performing stand-alone tasks. |
| Group IS | An information system that improves communications and support collaboration among members of a workgroup. |
| Enterprise IS | An information system that an organization uses to define structured interactions among its own employees and/or with external customers, suppliers, government agencies, and other business partners. |

1. The organizational complements include:

* **Well-trained workers.** Employees must be well trained and understand the need for the new system, what their role is in using or operating the system, and how to get the results they need from the system.
* **System support.** Trained and experienced users who can show others how to gain value from the system and overcome start-up problems.
* **Better teamwork**. Employees must understand and be motivated to work together to achieve the anticipated benefits of the system.
* **Redesigned processes.** New systems often require radical redesign of existing work processes as well as the automation of new processes.
* **New decision rights.** Employees must understand and accept their new roles and responsibilities including who is responsible for making what decisions. Roles and responsibilities often change with introduction of a new system.

1. Software consists of the computer programs that govern the operation of a particular computing device, be it desktop computer, laptop, tablet, smartphone, or some other device. There are two types of software: system software and application software. System software oversees basic computer operations such as start-up, controls access to system resources, and manages memory and files. Application software allows you to accomplish specific tasks, including editing text documents, creating graphs, and playing games.
2. Consumerization of IT is the trend of consumer technology practices influencing the way business software is designed and delivered.
3. The extract-transform-load process is the one by which raw data is extracted from various sources, transformed into a format to support the analysis to be performed, and loaded into the data warehouse.
4. Big data is a term used to describe data collections that are so enormous (think petabytes or larger) and complex (from sensor data to social media data) that traditional data management software, hardware, and analysis processes are incapable of dealing with them.
5. Cloud computing is a means of providing computing services wherein a service provider organization owns and manages the hardware, software, networking, and storage devices, with cloud user organizations (called tenants) accessing slices of shared resources via the Internet.
6. An extranet is a network based on Web technologies that allows selected outsiders, such as business partners and customers, to access authorized resources of a company’s intranet.
7. The Internet of Things is most closely associated with machine-to-machine communications while The Internet of Everything (IoE) encompasses not only machine-to-machine but also people-to-people and people-to-machine connections.
8. E-commerce involves the exchange of money for goods and services over electronic networks and encompasses many of an organization’s outward-facing processes that touch customers, suppliers, and other business partners. E -business goes beyond e-commerce by using information systems and networks to perform business-related tasks and functions.
9. A transaction processing system is an organized collection of people, procedures, software, databases, and devices used to process and record business transactions. A management information system is an organized collection of people, procedures, software, databases, and devices that provides routine information to managers and decision makers. An enterprise resource planning (ERP) system is a system that supports an organization’s routine business processes, maintains records about those processes, and provides extensive reporting and data analysis capabilities.
10. Business analytics can be defined as the extensive use of data and quantitative analysis to support fact-based decision making within organizations. Business intelligence is another term used.
11. Knowledge management is a strategy by which an organization determinedly and systematically gathers, organizes, stores, analyzes, and shares its collective knowledge and experience. The goal is to deal with issues and problems in an effective manner by unleashing the collective value of the organization’s best thinking.
12. The components of the shared vision include hiring the right people with the correct skills and competencies, choosing the right technologies and vendors to explore and develop, installing the right systems, and focusing on those projects that are needed to move the organization closer to its vision and meeting its mission.
13. An advantage to using open-source software is the cost – it’s free and there are no maintenance costs. A disadvantage could be that the amount and quality of support for open source software is dependent on whether or not there are people, resources, and interest among the user community to develop updates and fix bugs.
14. A cybercriminal is a computer hacker who is motivated by the potential for monetary gain; cybercriminals hack into computer systems to steal, often by transferring money from one account to another or by stealing and reselling credit card numbers, personal identities, and financial account information. A cyberterrorist intimidates a government or a civilian population by using information technology to disable critical national infrastructure (e.g., energy, transportation, financial, law enforcement, emergency response) to achieve political, religious, or ideological goals.
15. Three specific issues could include job losses caused by increasingly sophisticated, humanlike systems, invasion of privacy through various data collection programs, and freedom of expression versus censorship.

***Discussion Questions***

1. Regardless of major or interest areas, information systems will play a central role in all business careers. Even now, students use information technology daily ranging from grocery purchases to filing taxes to using the postal system. Information technology is present in all aspects of life and business. Information systems improve planning, communication, data management, report formatting and generation, input collection, and decision-making. A student may respond with a statement similar to this, “By becoming information systems literate, I hope to be competitive in the work force and develop skills that enhance my career and make me an asset to the business I join.”
2. Students answers will vary. Examples of how information systems can be used by teachers:
   * Teachers can post lesson plans and grades for parents and other staff to view
   * Student and teacher information can be kept in a database to be accessed by the county schools
3. Student’s answers will vary. As mentioned above, information systems improve planning, communication, data management, report formatting and generation, input collection, and decision-making. These are all important aspects of any course taken in any subject.
4. The increase in digital data means a huge increase in database storage needs, which will require more storage devices, more space to house the additional storage devices, and additional electricity to operate them.
5. There is the possibility of increasing the digital divide. As more people are using smartphones and have access to the Internet they become more connected with access to more information, leaving those without even further behind. Other issues may arise in terms of the health of the smartphone users. Sleep issues, depression, loneliness and lack of social interaction have all been linked to smartphone use.
6. Student responses will vary.
7. Student responses will vary. Note that businesses around the globe are enjoying better safety and service, greater efficiency and effectiveness, reduced expenses, and improved decision making and control because of information systems.
8. Student responses will vary. Note that Fidelity Investments, as well as most other investment companies, offers its customers a wide range of powerful investment tools and access to extensive online research. Automobiles are available with advanced navigation systems that not only guide you to your destination but also incorporate the latest weather and traffic conditions to help you avoid congestion and traffic delays. Digital cameras, mobile phones, music players, and other devices rely on CBISs to bring their users the latest and greatest features.
9. Student responses will vary. Management needs to ensure the new system supports their routine business processes, maintains records about those processes, and provides extensive reporting. At the core of a modern enterprise resource planning system is the capability to support e-business and business analytics.
10. Some benefits of cloud computing may include no hardware or software installation or maintenance and lower capital costs. Risks might include privacy and security issues, host downtime, and limited control.
11. Student responses will vary. They should describe three new applications made possible by the Internet of Everything.
12. Student responses will vary.
13. Student response will vary. One company that may come to mind is Twitter.
14. A strong security program begins by assessing threats to the organization’s computers and network, identifying actions that address the most serious vulnerabilities, and educating end users about the risks involved and the actions they must take to prevent a security incident.

***Problem-Solving Exercises***

1. Student should prepare a data disk and a backup disk (using USB flash drives) for the problem-solving exercises and other computer-based assignments they will complete in this class.
2. Students should create a table that lists 10 or more possible career areas, annual salaries, and brief job descriptions, and rate how much they would like the career area on a scale from 1 (don’t like) to 10 (like the most).
3. Students should use presentation software to create three slides identifying what he hopes to learn from this course.

***Team Activities***

1. Students should form teams and find out one interesting fact about each member.
2. Students should write a summary about the members of their team.
3. Students should search through several business periodicals (Bloomberg, Businessweek, Computerworld, PC Week, etc.) or use an Internet search engine to find recent articles that describe potential social or ethical issues related to the use of an information system.

***Web Exercises***

1. Students should access the site [www.cengage.com](http://www.cengage.com) and submit a report about their findings.
2. Students should use the Internet to search for information about countries with the strongest degree of Internet censorship and state why these countries are so poorly rated.
3. Students should use a graphics program to illustrate the growth of the 10 fastest growing occupations and provide a summary on his findings.

***Career Exercises***

1. Students should identify 10 job characteristics that are important to them in selecting a career.
2. Students should write a report describing the job opportunities, job duties, and starting salaries of two or three careers.

***Case Studies***

*Case One:* *Connecting Patient Monitoring Devices to EHRs*

*Critical Thinking Questions*

1. Student responses may vary. Some benefits may include: increased efficiency, better patient care, and reduced costs. An additional benefit gained by feeding data directly into the HER from patient monitors could be a reduction in copying errors.
2. Student responses will vary. There are risks involved in sharing electronic records and there is also the risk of private data being leaked. Another important risk involves data protection. Connecting to monitors to the IoT can introduce the possibility of having the devices hacked.
3. Is encryption use being enforced and how many people have access to the EHR data?

*Case Two:**BMW: Automaker Competes on the Digital Front*

*Critical Thinking Questions*

1. Student response will vary. Connected-car technologies can increase customer loyalty.
2. BMW has the responsibility of keeping its customer data safe.
3. Supply chain management and product lifecycle management would be important components in the ERP system. These tools would have to shift their focus and goal if BMW establishes a partnership with a technology company, as it will no longer need to develop technology in-house.