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| **UNIT TWO**  **Exploring Business Intelligence** |

Information is powerful. Information tells an organization everything from how its current operations are performing to estimating and strategizing how future operations might perform. New perspectives open up when people have the right information and know how to use it. The ability to understand, digest, analyze, and filter information is a key to success for any professional in any industry.

This unit demonstrates the value an organization can uncover and create by learning how to manage, access, analyze, and protect organizational information. The chapters in this unit include:

* [**Chapter Six** – Valuing Organizational Information](#Chapter6)
* **[Chapter Seven](#Chapter7)** [– Storing Organizational Information—Databases](#Chapter7)
* [**Chapter Eight** – Accessing Organizational Information—Data Warehouse](#Chapter8)

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| **CHAPTER SIX**  **Valuing Organizational Information** |

This chapter provides an overview of information levels, formats and granularities. It also discusses the differences between transactional and analytical information. The chapter concludes with a discussion on the issues found in low quality information and how to obtain high quality information.

**LEARNING OUTCOMES**

* 1. **Explain the four primary traits that determine the value of information.**

Information levels include individual, department, and enterprise. Information formats include document, presentation, spreadsheet, and database. Information granularities include detail, summary, and aggregate.

Information is data converted into a meaningful and useful context. Information can tell an organization how its current operations are performing and help it estimate and strategize about how future operations might perform. It is important to understand the different levels, formats, and granularities of information along with the four primary traits that help determine the value of information, which include (1) information type: transactional and analytical; (2) information timeliness; (3) information quality; (4) information governance.

Transactional information encompasses all of the information contained within a single business process or unit of work, and its primary purpose is to support the performing of daily operational tasks. Examples of transactional information include withdrawing cash from an ATM or making an airline reservation. Analytical information encompasses all organizational information, and its primary purpose is to support the performing of managerial analysis tasks. Examples of analytical information include trends, sales, and product statistics.

* Accuracy determines if all values are correct. Example – is the name spelled correctly?
* Completeness determines if any values are missing. Example - is the address complete?
* Consistency ensures that aggregate or summary information is in agreement with detailed information. Example – do totals equal the true total of the individual fields?
* Uniqueness ensures that each transaction, entity, and event is represented only once in the information. Example – are there any duplicate customers?
* Timeliness determines if the information is current with respect to the business requirement. Example – is the information updated weekly?

Using the wrong information can lead to making the wrong decision. Making the wrong decision can cost time, money, and even reputations. Business decisions are only as good as the information used to make the decision. Low quality information leads to low quality business decisions. High quality information can significantly improve the chances of making a good business decision and directly affect an organization’s bottom line.

**CLASSROOM OPENER**

**GREAT BUSINESS DECISIONS – Julius Reuter Uses Carrier Pigeons to Transfer Information**

In 1850, the idea that sending and receiving information could add business value was born. Julius Reuter began a business that bridged the gap between Belgium and Germany. Reuter built one of the first information management companies built on the premise that customers would be prepared to pay for information that was timely and accurate.

Reuter used carrier pigeons to forward stock market and commodity prices from Brussels to Germany. Customers quickly realized that with the early receipt of vital information they could make fortunes. Those who had money at stake in the stock market were prepared to pay handsomely for early information from a reputable source, even if it was a pigeon. Eventually, Reuter’s business grew from 45 pigeons to over 200 pigeons.

Eventually the telegraph bridged the gap between Brussels to Germany, and Reuter’s brilliantly conceived temporary monopoly was closed.

**CLASSROOM EXERCISE**

**Understanding Information’s Quality**

Break your students into groups and ask them to compile a list of all of the issues found in the following information. Ask your students to also list why most low quality information errors occur and what an organization can do to help implement high quality information.

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Customer ID** | **Customer First Name** | **Customer Last Name** | **Address** | **City** | **State** | **Zip** | **Phone** |
| 1771 | Larry | Shimk | 143 S. | Denver | NY | 178908 | 911 |
| 1771 | Caroline | Shimk | 143 N. West St. | Buffalo | NY | 14321 | 716-333-4567 |
| 1772 | Shimk | Caroline | 143 N. West St. | Buffalo | NY | 14321 | 716-333-4567 |
| 1772 | Heather | Schwiter | 55 N. W. S. Miss | LaGrange | GA | 14321 | 716-333-4567 |
| 1772 | Debbie | Fernandez | S. Main St. | Denver | CO | 80252 | 333-8965 |
| 1772 | Debbie | Fernandez | S. Main St. | Denver | CO | 80252 | 333-8965 |
| 1773 | Justin | Justin | 34 Kerry Rd. | Littleton | CO | 98987 | 716-67-9087 |
| 1774 | Pam |  | 66 S. Carlton | North Glen | CO | 98765 | 343-456-6857 |

**CORE MATERIAL**

The core chapter material is covered in detail in the PowerPoint slides. Each slide contains detailed teaching notes including exercises, class activities, questions, and examples. Please review the PowerPoint slides for detailed notes on how to teach and enhance the core chapter material.

**GRADUATE MATERIAL**

Here are a few items to add to your course if you are teaching graduate students.

* **Excellent video to jumpstart your BI lecture.**

Is there any business intelligence out there? Mike Arcuri, group program manager on the business intelligence team shows off Excel 12's new features for looking at how your business is doing. You'll never look at pivot tables the same way again.

<http://channel9.msdn.com/Blogs/Charles/Business-Intelligence-in-Excel-2007>

* **The Long Tail**

Chris Anderson, the editor of WIRED (not to be confused with the curator of TED, who has the same name), explores the four key stages of any viable technology: setting the right price, gaining market share, displacing an established technology and, finally, becoming ubiquitous. To demonstrate this trajectory, Anderson explores the evolution of the DVD player as it passes through each of these four tipping points, then offers specific examples of current trends in technology -- ranging from DNA sequencing to the hybrid -- to illustrate each stage of the game.

<http://www.ted.com/index.php/talks/view/id/72>

**OPENING UNIT CASE STUDY QUESTIONS**

**Information Timeliness**

**1. List the reasons a business would want to display information in a graphic or visual format.**

Information is powerful. Information can tell an organization how its current operations are performing and help it estimate and strategize about how future operations might perform. The ability to understand, digest, analyze, and filter information is key to growth and success to any professional in any industry. Remember that new perspectives and opportunities can open up when you have the right data that you can turn into information and ultimately business intelligence. The value of timely information is critical to any business that wants to operate at the same speed as its customers, suppliers, and competitors.

**2. Categorize the five common characteristics of high-quality information and rank them in order of importance for Hotels.com.**

Student answers to this question will vary depending on their personal views and experiences with technology. The important part of the question is understanding the students’ justifications for their order. Potential order of importance:

* Timeliness – Hotels.com information must be timely. If users are receiving old and outdated answers to their queries, they will not use the website and head to a competitors.
* Accuracy – Hotels.com website information must be accurate
* Consistency – Hotels.com results must be consistent. Users will not trust the system if it provides different results or prices for the same hotel at different times.
* Completeness – Hotels.com search results need to be complete and identify all hotels the customer is looking for based on his/her query.
* Uniqueness – Hotels.com users expect to receive unique answers to their queries, not the same hotels listed over and over again.

**3. Explain how Hotels.com is preventing any issues associated with low-quality information.**

As with any database management system, governance is a key issue. Without governance, there is no control over how information is published and maintained. But as websites like Hotels.com grow in volume, it will be nearly impossible to govern them.

If Hotels.com contained information that was inaccurate its customers would discontinue using it as a source for information. It could also find itself in legal trouble if it allows entries stating inaccurate information.

**CHAPTER SIX CASE**

**Political Microtargeting: What Data Crunchers Did for Obama**

1. **Describe the difference between transactional and analytical information and determine which types Spotlight used to identify its 10 tribes.**

Transactional information encompasses all of the information contained within a single business process or unit of work, and its primary purpose is to support the performing of daily operational tasks. Analytical information encompasses all organizational information, and its primary purpose is to support the performing of managerial analysis tasks. Spotlight is using transactional information to make analytical decisions. The transactional information includes individuals names, neighborhood details, family sizes, and spending patterns to categorize every American of voting age—175 million of us—into 10 "values" tribes. The analytical decisions that are made from this information include determining swing voters and important areas for Obama to campaign.

1. **Explain the importance of high quality information for political microtargeting.**

If the information received by Spotlight was of low quality then any analysis about voters would be incorrect and Obama would not know where to campaign to win the election.

1. **Review the five common characteristics of high quality information and rank them in order of importance for political microtargeting.**

Student answers to this question will vary depending on their personal views and experiences with technology. The important part of the question is understanding the student’s justifications for their order. Potential order of importance:

* Timeliness – Without timely information it is impossible to make decisions. If voter information was 15 years old it would not be relevant today.
* Accuracy – inaccurate information will lead to incorrect campaign decisions.
* Completeness – incomplete information will make it harder to make campaign decisions.
* Consistency – information inconsistency could occur if voters gave conflicting information during the information gathering process.
* Uniqueness – voter information could accidently be entered twice

1. **In terms of political microtargeting explain the following sentence: It is never possible to have all of the information required to make a 100 percent accurate prediction.**

No, Spotlight will never have every single piece of voter information. It would be almost impossible to contact and solicit accurate and complete information from every single voter. However, they have enough to make an accurate estimate about voter behavior. If you wait to have every single piece of information you would probably never make a decision. We typically receive enough information to make an accurate decision. Of course, the more information you have, the better the decision you can make, but if you wait to get every piece of information you will take too long to make the decision.

1. **Do you agree that political microtargeting signals the dehumanization of politics?**

Student answer to this question will vary. Makes for a great classroom debate.

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| **CHAPTER SEVEN**  **Storing Organizational Information—Databases** |

This chapter focuses on the relational database model. It introduces students to entities, attributes, primary keys, foreign keys, and the four components in a DBMS:

* Data definition component – helps create and maintain the data dictionary and the structure of the database
* Data manipulation component – allows users to create, read, update, and delete information in a database
* Application generation component – includes tools for creating visually appealing and easy-to-use applications
* Data administration component – provides tools for managing the overall database environment by providing faculties for backup, recovery, security, and performance

**LEARNING OUTCOMES**

**Learning Outcome: 7.1 Describe a database, a database management system, and the relational database model**.

A database maintains information about various types of objects (inventory), events (transactions), people (employees), and places (warehouses). A database management system (DBMS) creates, reads, updates, and deletes data in a database while controlling access and security. A DBMS provides methodologies for creating, updating, storing, and retrieving data in a database. In addition, a DBMS provides facilities for controlling data access and security, allowing data sharing, and enforcing data integrity. The relational database model allows users to create, read, update, and delete data in a relational database.

**Learning Outcome: 7.2 Identify the business advantages of a relational database.**

Database advantages from a business perspective include

* Increased flexibility
* Increased scalability and performance
* Reduced information redundancy
* Increased information integrity (quality)
* Increased information security

Many business managers are familiar with Excel and other spreadsheet programs they can use to store business data. Although spreadsheets are excellent for supporting some data analysis, they offer limited functionality in terms of security, accessibility, and flexibility and can rarely scale to support business growth. From a business perspective, relational databases offer many advantages over using a text document or a spreadsheet, including increased flexibility, increased scalability and performance, reduced information redundancy, increased information integrity (quality), and increased information security.

**Learning Outcome: 7.3 Explain the business benefits of a data-driven website.**

A data-driven website is an interactive website kept constantly updated and relevant to the needs of its customers using a database. Data-driven capabilities are especially useful when the website offers a great deal of information, products, or services because visitors are frequently annoyed if they are buried under an avalanche of information when searching a website. Many companies use the Web to make some of the information in their internal databases available to customers and business partners.

**Learning Outcome: 7.4 Explain why an organization would want to integrate its databases.**

* Forward integration – takes information entered into a given system and sends it automatically to all downstream systems and processes.
* Backward integration – takes information entered into a given system and sends it automatically to all upstream systems and processes.

**CLASSROOM OPENER**

**GREAT BUSINESS DECISIONS – Edgar Codd’s Relational Database Theory**

Edgar Frank Codd was born at Portland, Dorset, in England. He studied mathematics and chemistry at Exeter College, Oxford, before serving as a pilot in the Royal Air Force during the Second World War. In 1948, he moved to New York to work for IBM as a mathematical programmer. In 1953 Codd moved to Ottawa, Canada. A decade later he returned to the USA and received his doctorate in computer science from the University of Michigan in Ann Arbor. Two years later he moved to San Jose, California to work at IBM's Almaden Research Center.

In the 1960s and 1970s he worked out his theories of data arrangement, issuing his paper "A Relational Model of Data for Large Shared Data Banks" in 1970, after an internal IBM paper one year earlier. To his disappointment, IBM proved slow to exploit his suggestions until commercial rivals started implementing them.

Initially, IBM refused to implement the relational model in order to preserve revenue from IMS/DB. Codd then showed IBM customers the potential of the implementation of its model, and they in turn pressured IBM. Then IBM included in its Future System project a System R subproject — but put in charge of it were developers who were not thoroughly familiar with Codd's ideas, and isolated the team from Codd. As a result, they did not use Codd's own Alpha language but created a non-relational one, SEQUEL. Even so, SEQUEL was so superior to pre-relational systems that it was copied, based on pre-launch papers presented at conferences, by Larry Ellison in his Oracle DBMS, which actually reached market before SQL/DS — due to the then-already proprietary status of the original moniker, SEQUEL had been renamed SQL.

Codd continued to develop and extend his relational model, sometimes in collaboration with Chris Date. One of the normalized forms, the Boyce-Codd Normal Form, is named after Codd. Codd also coined the term OLAP and wrote the twelve laws of online analytical processing, although these were never truly accepted after it came out that his white paper on the subject was paid for by a software vendor. Edgar F. Codd died of heart failure at his home in Williams Island, Florida at the age of 79 on Friday, April 18, 2003.

**CLASSROOM EXERCISE**

**Building an ER Diagram**

Break your students into groups and ask them to create an entity relationship diagram similar to the one in Figure 7.1 for a company or product of their choice. If the students are uncomfortable with databases, you should recommend that they stick to a company similar to the TCCBCE, perhaps a snack food producer, mountain bike equipment producer, or even a footwear producer. If your students are more comfortable with databases, ask them to choose a company that would challenge them such as a fast food restaurant, online book seller, or even a university’s course registration system.

The important part of this exercise is for your students to begin to understand how the tables in a database relate. Be sure their ER diagrams include primary keys and foreign keys. Have your students present their ER diagrams to the class and ask the students to find any potential errors with the diagrams.

**CORE MATERIAL**

The core chapter material is covered in detail in the PowerPoint slides. Each slide contains detailed teaching notes including exercises, class activities, questions, and examples. Please review the PowerPoint slides for detailed notes on how to teach and enhance the core chapter material.

**GRADUATE MATERIAL**

Here are a few items to add to your course if you are teaching graduate students.

* **DataMining Face Book**

Big Brother is watching you online.

Everything you post is being saved and recorded in a national database file on you. They're called profiles for a reason.

CIA Database on FaceBook

<http://www.youtube.com/watch?v=OwnTWZ1-UWY&feature=related>

The Dangers of FaceBook

<http://www.youtube.com/watch?v=-GGUEj4tQgQ&feature=related>

How to Hack FaceBook

<http://www.youtube.com/watch?v=n5cH3rI6j0g&feature=related>

Show the above videos and ask your students the following:

Do they believe that the CIA is collecting data from FaceBook?

If the CIA is collecting data from FaceBook is this a privacy violation?

If your FaceBook site is hacked what types of personal information are you at risk of losing?

How could someone use your FaceBook site to steal your identity?

If you could access the FaceBook database what types of information could you mine for business purposes?

* **Google Data Center First Video Tour**

Not long ago, Google data centers were a closely guarded secret. The company's technical innovations were regarded as a competitive advantage. But on April 1, in the spirit of a promise made in 2006 to be more transparent, Google revealed details about its custom servers and its data centers. Google opened its kimono before more than 100 industry leaders and journalists at its Mountain View, Calif., headquarters and now has posted a video tour of one of its data centers and videos of its presentation on YouTube.

"We disclosed for the first time details about the design of our ultraefficient data centers," Google engineer Jimmy Clidaras said in a blog post Thursday. "We also provided a first-ever video tour of a Google container data center as well as a water treatment facility. We detailed how we measure data center efficiency and discussed how we reduced our facility energy use by up to 85%. The engineers who developed our efficient battery backup solution even brought an actual Google server to the event."

http://www.youtube.com/watch?v=zRwPSFpLX8I

After watching the video ask your students the following:

What impact could a data center such as Googles have on the environment?

How does power efficiency affect revenue for businesses that depend on data centers?

Rank the ilities from 1 - 5 found in Chapter 5 for Google's data center. Be sure to justify your ranking

**OPENING UNIT CASE STUDY QUESTIONS**

**Information Informing**

1. **Explain why database technology is important to a business.**

Without databases, a business simply would not exist for two primary reasons. First, vast amounts of information are at the heart of a business and without databases it would be impossible to store and retrieve the information. This is the information that customers are editing and researching. Second, a business uses database to store its indexes and to find and retrieve the information that its customers are looking for. Again, without databases a company simply would not exist – its business operates entirely on databases.

1. **Develop a list of possible entities located in Hotels.com database.**

Entity could include:

* ROOMS
* INVENTORY
* AMENITIES
* EMPLOYEES
* SCHEDULES
* RATES
* GUESTS

1. **Develop a list of possible attributes located in Hotels.com database.**

Attributes could include:

* Employee Name
* Employee Address
* Employee Title
* Employee Wage
* Room size
* Bed size
* Fridge
* Amenities
* Towels
* Guest Name
* Guest Address
* Guest Payment
* Reservation Dates
* Number in Room

**CHAPTER SEVEN CASE**

**Keeper of the Keys**

1. **How many organizations have your personal information, including your Social Security number, bank account numbers, and credit card numbers?**

This number will vary by student. Potential holders could include:

* Banks
* Colleges
* Credit Card Companies
* Stores that Issue Credit
* Insurance Companies
* Auto Dealerships
* Professors (if Social Security Number is used as Student ID)
* Government Agencies
* Loan Applications
* Hospitals
* Doctor’s Offices
* Dentist Offices

1. **What information is stored at your college? Is there any chance your information could be hacked and stolen from your college?**

All of your personal information is stored at your college from date of birth to social security number. Absolutely, information can be stolen from any organization. Colleges have numerous college students working at different locations across campuses who could easily access personal information. This is one reason many colleges no longer use social security numbers as student identification numbers.

1. **What can you do to protect yourself from identity theft?**

Continuously checking your credit report and perhaps purchasing identity theft protection services is the best way to ensure you are safe from identity theft. Be careful not to give your information to any individual who does not need it – especially via email or telephone calls. Be aware of phising scams and other ways people might try to steal your information and buy a shredder for your documents.

1. **Do you agree or disagree with changing laws to hold the company where the data theft occurred accountable? Why or why not?**

Student answers to this question will vary. The important part of their answer is the justification as to why or why not the company should be held accountable. One comment to get your students thinking would be should a bank be held liable if a gunman robs the bank? Is this the same type of theft and situation?

1. **What impact would holding the company liable where the data theft occurred have on large organizations?**

Companies would take greater actions to ensure the safety of customer information.

1. **What impact would holding the company liable where the data theft occurred have on small business?**

Small businesses would have to spend more money ensuring the safety of customer data and it might drain resources that are fundamental in keeping the business running.

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| **CHAPTER EIGHT**  **Accessing Organizational Information—Data Warehouse** |

This chapter takes a step beyond databases and introduces students to data warehousing, data warehousing tools, and data mining. These technologies allow organizations to gain vast amounts of business intelligence.

**LEARNING OUTCOMES**

* 1. **Describe the roles and purposes of data warehouses and data marts in an organization.**

The primary purpose of data warehouses and data marts are to perform analytical processing or OLAP. The insights into organizational information that can be gained from analytical processing are instrumental in setting strategic directions and goals.

Databases contain information in a series of two-dimensional tables, which means that you can only ever view two dimensions of information at one time. In a data warehouse and data mart, information is multidimensional, it contains layers of columns and rows. Each layer in a data warehouse or data mart represents information according to an additional dimension. Dimensions could include such things as products, promotions, stores, category, region, stock price, date, time, and even the weather. The ability to look at information from different dimensions can add tremendous business insight.

An organization must maintain high quality information in the data warehouse. Information cleansing and scrubbing is a process that weeds out and fixes or discards inconsistent, incorrect, or incomplete information. Without high quality information the organization will be unable to make good business decisions.

**8.2 Identify the advantages of using business intelligence to support managerial decision making.**

Many organizations today find it next to impossible to understand their own strengths and weaknesses, let alone their biggest competitors, due to enormous volumes of organizational data being inaccessible to all but the MIS department. Organization data include far more than simple structured data elements in a database; the set of data also includes unstructured data such as voice mail, customer phone calls, text messages, video clips, along with numerous new forms of data, such as tweets from Twitter. Managers today find themselves in the position of being data rich and information poor, and they need to implement business intelligence systems to solve this challenge.

**CLASSROOM OPENER**

**GREAT BUSINESS DECISIONS – Bill Inmon – The Father of the Data Warehouse**

Bill Inmon, is recognized as the "father of the data warehouse" and co-creator of the "Corporate Information Factory." He has 35 years of experience in database technology management and data warehouse design. He is known globally for his seminars on developing data warehouses and has been a keynote speaker for every major computing association and many industry conferences, seminars, and tradeshows.

As an author, Bill has written about a variety of topics on the building, usage, and maintenance of the data warehouse and the Corporate Information Factory. He has written more than 650 articles, many of them have been published in major computer journals such as Datamation, ComputerWorld, DM Review and Byte Magazine. Bill currently publishes a free weekly newsletter for the Business Intelligence Network, and has been a major contributor since its inception. <http://www.b-eye-network.com/home/>

**CLASSROOM EXERCISE**

**Analyzing Multiple Dimensions of Information**

Jump! is a company that specializes in making sports equipment, primarily basketballs, footballs, and soccer balls. The company currently sells to four primary distributors and buys all of its raw materials and manufacturing materials from a single vendor. Break your students into groups and ask them to develop a single cube of information that would give the company the greatest insight into its business (or business intelligence).

* Product A, B, C, and D
* Distributor X, Y, and Z
* Promotion I, II, and III
* Sales
* Season
* Date/Time
* Salesperson Karen and John
* Vendor Smithson

**CORE MATERIAL**

The core chapter material is covered in detail in the PowerPoint slides. Each slide contains detailed teaching notes including exercises, class activities, questions, and examples. Please review the PowerPoint slides for detailed notes on how to teach and enhance the core chapter material.

**GRADUATE MATERIAL**

Here are a few items to add to your course if you are teaching graduate students.

* **Data Mining for Terrorists**

Rather frightening video on how terrorists use data mining tools. A Fox News report of an extensive Israeli data mining operation that closely resembles the current American program to monitor telephonic traffic patterns for possible terrorist activity.

<http://www.youtube.com/watch?v=e5C2rnjdWfk>

Ask your students to watch the video and answer the following questions

Why would terrorists use data mining tools to gain intelligence?

What types of United States databases, besides the Telephonic database, would terrorists want to hack for data mining purposes?

What can the United States government do to ensure its databases are safe from terrorists?

What can individuals do to protect their computers from hackers?

* **Minning Physician Data Debate**

Listen to the NPR story at:

<http://www.npr.org/templates/story/story.php?storyId=11382945>

Ask your students the following questions:

1)Do you agree that mining physician data should be illegal? Why or why not?

2) As a patient how do you feel about pharmaceutical companies mining your doctor's data?

3) As an employee of one of the pharmaceutical companies how do you feel about mining physician data?

* **The Brain Behind the Big, Bad Burger and Other Tales of Business Intelligence**

You will enjoy this one! It is an excellent article on the side of BI – but seriously scary on the side of fast food. Be warned – you might never eat fast food again!!

<http://www.cio.com/article/109454/The_Brain_Behind_the_Big_Bad_Burger_and_Other_Tales_of_Business_Intelligence>

Read the above article and discuss the following:

A) What does business intelligence really mean to a business?

B) What are the negative impacts of business intelligence?

C) How does a database and data warehouse support business intelligence?

D) Any other thoughts or insights you have into this chapter and this case

**OPENING UNIT CASE STUDY QUESTIONS**

**Information Informing**

**1. List the reasons a business would want to display information in a graphic or visual format.**

Information is powerful. Information can tell an organization how its current operations are performing and help it estimate and strategize about how future operations might perform. The ability to understand, digest, analyze, and filter information is key to growth and success to any professional in any industry. Remember that new perspectives and opportunities can open up when you have the right data that you can turn into information and ultimately business intelligence. The value of timely information is critical to any business that wants to operate at the same speed as its customers, suppliers, and competitors.

**2. Describe how a business could use a business intelligence digital dashboard to gain an understanding of how the business is operating**.

Data visualization describes technologies that allow users to “see” or visualize data to transform information into a business perspective. Data visualization tools move beyond Excel graphs and charts into sophisticated analysis techniques such as pie charts, controls, instruments, maps, time-series graphs, and more. Data visualization tools can help uncover correlations and trends in data that would otherwise go unrecognized. Business intelligence dashboards track corporate metrics such as critical success factors and key performance indicators and include advanced capabilities such as interactive controls allowing users to manipulate data for analysis. The majority of business intelligence software vendors offer a number of different data visualization tools and business intelligence dashboards.

**3.** **Explain how a marketing department could use data visualization tool to help with the release of a new product**.

Data visualization describes technologies that allow users to “see” or visualize data to transform information into a business perspective. Data visualization tools move beyond Excel graphs and charts into sophisticated analysis techniques such as pie charts, controls, instruments, maps, time-series graphs, and more. Data visualization tools can help uncover correlations and trends in data that would otherwise go unrecognized. Business intelligence dashboards track corporate metrics such as critical success factors and key performance indicators and include advanced capabilities such as interactive controls allowing users to manipulate data for analysis. The majority of business intelligence software vendors offer a number of different data visualization tools and business intelligence dashboards.

**4. Assess how Hotels.com is using BI to identify trends and change associated business processes.**

Organizations can use BI to find the cause to many issues and problems simply by asking “Why?” The process starts by analyzing a report such as sales amounts by quarter. Managers will drill down into the report looking for why sales are up or why sales are down. Once they understand why a certain location or product is experiencing an increase in sales, they can share the information in an effort to raise enterprisewide sales. Once they understand the cause for a decrease in sales, they can take effective action to resolve the issue. Here are a few examples of how managers can use BI to answer tough business questions:

* Where has the business been? Historical perspective offers important variables for determining trends and patterns.
* Where is the business now? Looking at the current business situation allows managers to take effective action to solve issues before they grow out of control.
* Where is the business going? Setting strategic direction is critical for planning and creating solid business strategies.

Ask a simple question—such as who is my best customer or what is my worst-selling product—and you might get as many answers as you have employees. Databases, data warehouses, and data marts can provide a single source of “trusted” data that can answer questions about customers, products, suppliers, production, finances, fraud, and even employees. They can also alert managers to inconsistencies or help determine the cause and effects of enterprisewide business decisions. All business aspects can benefit from the added insights provided by business intelligence, and you, as a business student, will benefit from understanding how MIS can help you make intelligent decisions.

**CHAPTER EIGHT CASE**

**Mining the Data Warehouse**

1. **Explain how Ben & Jerry’s is using business intelligence tools to remain successful and competitive in a saturated market.**

Ben & jerry’s tracks the ingredients and life of each pint in a data warehouse. If a consumer calls in with a complaint, the consumer affairs staff matches up the pint with which supplier’s mile, eggs, or cherries, etc. did not meet the organization’s near-obsession with quality.

1. **Identify why information cleansing and scrubbing is critical to California Pizza Kitchen’s business intelligence tool’s success.**

Financial statements must be as accurate and complete as possible. There have been too many instances in the past where shoddy financial statements have lead to financial crisis such as Enron and WorldCom. It does not matter how good or how many BI tools California Pizza Kitchen uses; if the core data is dirty the results will be inaccurate.

1. **Illustrate why 100 percent accurate and complete information is impossible for Noodles & Company to obtain.**

Noodles & Company will never have 100 percent accurate and complete information. Perfect information is pricey. Achieving perfect information is almost impossible. The more complete and accurate an organization wants to get its information, the more it costs. The tradeoff between perfect information lies in accuracy verses completeness. Accurate information means it is correct, while complete information means there are no blanks. Most organizations determine a percentage high enough to make good decisions at a reasonable cost, such as 85% accurate and 65% complete.

1. **Describe how each of the companies above is using BI to gain a competitive advantage.**

Ben & Jerry’s is using BI to improve quality. Customers know that a pint of Ben & Jerry’s ice cream is of the highest quality.

California Pizza Kitchen and Noodles & Company are using BI to improve financial analysis capabilities. Both companies can now receive more accurate and complete financial views of their businesses.

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| **UNIT TWO**  **CLOSING MATERIAL** |

**CLOSING CASE ONE**

**Data Visualization: Stories for the Information Age**

**1. Identify the effects poor information might have on a data visualization project.**

Using the wrong information can lead to making the wrong decision. Making the wrong decision can cost time, money, and even reputations. Business decisions are only as good as the information used to make the decision. Low quality information leads to low quality business decisions. High quality information can significantly improve the chances of making a good business decision and directly affect an organization’s bottom line. A data visualization project must use high quality information whenever it is making business decisions, especially decisions that affect its business strategy.

**2. How does data visualization use database technologies?**

Data visualization is a way to make sense of the ever-increasing stream of information with which we’re bombarded and provides a creative antidote to the analysis paralysis that can result from the burden of processing such a large volume of information. “It’s not about clarifying data,” says Koblin. “It’s about contextualizing it.” It’s essential to understand the importance of creative vision along with the technical mastery of software. Data visualization isn’t about using all the data available, but about deciding which patterns and elements to focus on, building a narrative, and telling the story of the raw data in a different, compelling way.

**3. How could a business use data visualization to identify new trends?**

There are real implications for business here. Most cell phone providers, for instance, offer a statement of a user’s monthly activity. Most often it’s an overwhelming table of various numerical measures of how much you talked, when, with whom, and how much it cost. A visual representation of this data might help certain patterns emerge, revealing calling habits and perhaps helping users save money.

Companies can also use data visualization to gain new insight into consumer behavior. By observing and understanding what people do with the data—what they find useful and what they dismiss as worthless—executives can make the valuable distinction between what consumers say versus what they do. Even now, this can be a tricky call to make from behind the two-way mirror of a traditional qualitative research setting.

**4. What is the correlation between data mining and data visualization?**

Data visualization isn’t about using all the data that is available and so is data mining. With data mining and data visualization you are taking pieces of the data and using it to determine patterns and elements to focus on, building a narrative, and telling the story of the raw data in a different, compelling way.

**5. Is data visualization a form of business intelligence? Why or why not?**

Yes! Data visualization is a form of storytelling that helps to identify correlations, patterns, trends, in the data. It’s about telling the story locked in the data differently, more engagingly, in a way that draws us in, makes our eyes open a little wider and our jaw drop ever so slightly. And as we process it, it can sometimes change our perspective altogether

**6. What security issues are associated with data visualization?**

The security and ethical issues associated with data visualization are the same as any information technology including:

• Information theft

• Information misuse

• Hackers

• Viruses

• Information privacy

**7. What might happen to a data visualization project if it failed to cleanse or scrub its data?**

A data visualization project might maintain high quality information in its data warehouse. Information cleansing and scrubbing is a process that weeds out and fixes or discards inconsistent, incorrect, or incomplete information. Without high quality information the project will be unable to make any correlations in the data. Potential business effects resulting from low quality information include:

• Inability to accurately track customers

• Difficulty identifying valuable customers

• Inability to identify selling opportunities

• Marketing to nonexistent customers

• Difficulty tracking revenue due to inaccurate invoices

• Inability to build strong customer relationships – which increases buyer power

**CLOSING CASE TWO**

**Zillow -**

**1. List the reasons Zillow would need to use a database to run its business.**

Without a database Zillow would be unable to store and quickly query the billions of records. There are many different models for organizing information in a database, including the hierarchical database, network database, and the most prevalent—the relational database model.

* In a hierarchical database model, information is organized into a tree-like structure that allows repeating information using parent/child relationships, in such a way that it cannot have too many relationships. Hierarchical structures were widely used in the first mainframe database management systems. However, owing to their restrictions, hierarchical structures often cannot be used to relate to structures that exist in the real world.
* The network database model is a flexible way of representing objects and their relationships. Where the hierarchical model structures information as a tree of records, with each record having one parent record and many children, the network model allows each record to have multiple parent and child records, forming a lattice structure.
* The relational database model is a type of database that stores information in the form of logically related two-dimensional tables. The relational database model stores information in the form of logically related two-dimensional tables. Entities, entity classes, attributes, primary keys, and foreign keys are all fundamental concepts included in the relational database model.

**2. Describe how Zillow uses business intelligence to create a unique product for its customers.**

Zillow uses business intelligence to analyze internal organization information and external information such as market trends, competitor information, and industry trends. Zillow could then analyze its business across markets, among its competitors, and throughout different industries.

**3. How could the marketing department at Zillow use a data mart to help with the release of a new product launch?**

The marketing department could use a data mart to determine which houses or apartments are currently the best selling and then use that information to generate mailing lists to customers looking for potential homes.

**4. Categorize the five common characteristics of high-quality information and rank them in order of importance to Zillow.**

Student answers to this question will vary depending on their personal views and experiences with technology. The important part of the question is understanding the students’ justifications for their order. Potential order of importance:

* Timeliness – Zillow information must be timely. If users are receiving old and outdated answers to their queries, they will not use the website and head to a competitors.
* Accuracy – Zillow’s website information must be accurate
* Consistency – Zillow’s results must be consistent. Users will not trust the system if it provides different results or prices for the same home on different dates or times.
* Completeness – Zillow’s search results need to be complete and identify all homes the customer is looking for based on his/her query.
* Uniqueness – Zillow users expect to receive unique answers to their queries, not the same home listed over and over again.

**5. Develop a list of some possible entities and attributes of Zillow’s mortgage database.**

Entity could include:

* HOME
* MORTGAGE
* SALES HISTORY

Attributes could include:

* Home Address
* Home Square Footage
* Sale Price

**6. Assess how Zillow uses a data-driven website to run its business.**

The data in Zillow’s website must be continuously updated based on current information. Homes are sold all over the country every minute and the website must keep up or it would be unable to compete in the fast paced real estate market.

**MAKING BUSINESS DECISIONS**

**Instructor Note**: There are few right or wrong answers in the business world. There are really only efficient and inefficient, and effective and ineffective business decisions. If there were always right answers businesses would never fail. These questions were created to challenge your students to apply the materials they have learned to real business situations. For this reason, the authors cannot provide you with one version of a correct answer. When grading your students’ answers, be sure to focus on their justification or support for their specific answers. A good way to grade these questions is to compare your student’s answers against each other.

1. **IMPROVING INFORMATION QUALITY**

**Project Purpose:** To understand and extrapolate the issues with data quality.

**Potential Solution:** An organization must maintain high quality information in the data warehouse. Information cleansing and scrubbing is a process that weeds out and fixes or discards inconsistent, incorrect, or incomplete information. Low quality information tends to have accuracy, completeness, relevance, and time issues. Without high quality information the organization will be unable to make good business decisions. Potential business effects resulting from low quality information include:

* Inability to accurately track customers
* Difficulty identifying valuable customers
* Inability to identify selling opportunities
* Marketing to nonexistent customers
* Difficulty tracking revenue due to inaccurate invoices
* Inability to build strong customer relationships – which increases buyer power

1. **INFORMATION TIMELINESS**

**Project Purpose:** To understand the role frequency plays in a backup or update strategy.

**Potential Solution:** Potential answers can include:

* Weather tracking system – must update in real-time to be able to track hurricanes, tornados, etc.
* Car dealership inventories – depending on the size and number of dealerships it could update hourly if there were many dealerships who shared inventories, or it could update nightly if there were only two dealerships that kept in close contact
* Vehicle tire sales forecasts – update weekly or monthly since the information is used for forecasting
* Interest rates – depending on what you are doing with the interest rates you might update hourly, daily, or weekly (if you are only using them for an analysis)
* Restaurant inventories – the size of the restaurant will probably play a factor in deciding the frequency of updates. Hourly for a large restaurant that can not afford to run out of any of its entrees, to daily for a small restaurant that has loyal customers and it is OK to tell its customers that it has run out of its specials.
* Grocery store inventories – near real-time to avoid product overstocking and understocking

1. **ENTITIES AND ATTRIBUTES**

**Project Purpose:** To apply database knowledge by building entities and attributes.

**Potential Solution:** Potential entities and associated attributes can include:

* CUSTOMER, Customer Number, First Name, Last Name, Address, Phone, email
* PRODUCT, Product ID, Name, Size, Color, Weight, Height, Quantity
* SALESREPRESENTATIVE, SaleRep ID, First Name, Last Name, Address, Phone
* INVOICE, Invoice Number, Customer Number, Product ID, Quantity, Price, Sales Rep ID

1. **INTEGRATING INFORMATION**

**Project Purpose:**  To understand the reasons for integrating information.

**Potential Solution:** Information levels include individual, department, and enterprise. Information formats include document, presentation, spreadsheet, and database. Information granularities include detail, summary, and aggregate. In a single organization you will find many different levels, formats, and granularities of information. Correlating these different types of information can help an organization analyze its information.

An integration allows separate systems to communicate directly with each other. Typical organizations maintain many different systems that store information in different levels, formats, and granularities. Integrating these systems can save an organization time and money. Without integrations, an organization will (1) spend considerable time entering the same information in multiple systems and (2) suffer from the low quality and inconsistency typically embedded in redundant information. A forward integration takes information entered into a given system and sends it automatically to all downstream systems and processes. A backward integration takes information entered into a given system and sends it automatically to all upstream systems and processes. Ideally, an organization wants to build forward and backward integrations; however, this can be expensive to maintain.

1. **INFORMATION – BUSINESS INTELLIGENCE OR A DIVERSION FROM THE TRUTH?**

**Project Purpose:** To understand business intelligence and the global business environment.

**Potential Solution:** Student answers to this question will vary. It is important to ensure that they provide the proper justification for their answers. Technology-focused students will tend to disagree with President Obama, especially if they are familiar with the data mining and business intelligence he used to run his campaign.

1. **ILLEGAL DATA ACCESS**

**Project Purpose:** To gain insight into database access and security issues.

**Potential Solution:** This question really touches on ethics and how companies need to monitor employees behavior since they are ultimately responsible for their actions. There are many data related policies the company could implement to help prevent this type of issue from occurring.

1. **DATA STORAGE**

**Project Purpose:** To review the websites that offer online data storage.

**Potential Solution:** Students will have fun visiting the different websites to determine which site offers the best solution. They might also find sites where they want to backup their critical data saving them time, energy, and frustration if they ever experience computer issues.

1. **GATHERING BUSINESS INTELLIGENCE**

**Project Purpose:** To understand the value of data.

**Potential Solution:** Student answers to this question will vary depending on the business they choose to start.

1. **FREE DATA!**

**Project Purpose:** To ensure the students understand the amount of data available on the Internet.

**Potential Solution:** Data is the key to starting a new business as they can review all types of current market information such as growth trends, population statistics, and business overviews.

1. **EXPLAINING RELATIONAL DATABASES**

**Project Purpose:** To ensure the students understand the relational database model.

**Potential Solution:** The relational database model stores information in the form of logically related two-dimensional tables. Entities, attributes, primary keys, and foreign keys are all fundamental concepts included in the relational database model. Relational database advantages from a business perspective include

* Increased flexibility
* Increased scalability and performance
* Reduced information redundancy
* Increased information integrity (quality)
* Increased information security

1. **INFORMATION TIMELINESS**

**Project Purpose:** To understand the role frequency plays in a backup or update strategy.

**Potential Solution:** Potential answers can include:

* Weather tracking system – must update in real-time to be able to track hurricanes, tornados, etc.
* Car dealership inventories – depending on the size and number of dealerships it could update hourly if there were many dealerships who shared inventories, or it could update nightly if there were only two dealerships that kept in close contact
* Vehicle tire sales forecasts – update weekly or monthly since the information is used for forecasting
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* Grocery store inventories – near real-time to avoid product overstocking and understocking

1. **IMPROVING INFORMATION QUALITY**

**Project Purpose:** To understand and extrapolate the issues with data quality.

**Potential Solution:** An organization must maintain high quality information in the data warehouse. Information cleansing and scrubbing is a process that weeds out and fixes or discards inconsistent, incorrect, or incomplete information. Low quality information tends to have accuracy, completeness, relevance, and time issues. Without high quality information the organization will be unable to make good business decisions. Potential business effects resulting from low quality information include:

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**APPLY YOUR KNOWLEDGE**

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| **AYK 1: DETERMING INFORMATION QUALITY ISSUES** |

There are numerous data issues including:

* 433 is missing a first name
* 436 is missing a last name
* The same zip code is used for both CO and OH in both 434s
* There are two different customers with customer number 434
* M. J. Jones and Margaret J. Jones could be the same customers since they have similar addresses
* Address for 433 is probably incorrect since the street and city are the same, 13 Denver, and Denver, CO
* 437 has too many digits in the zip code
* 436 has the wrong city and state, New York, CA
* 435 has the wrong city and state, San Francisco, OH

Addressing any of the following four primary sources of low quality information will increase Real People’s quality issues:

* Online customers intentionally enter inaccurate information to protect their privacy
* Information from different systems that have different information entry standards and formats
* Call center operators enter abbreviated or erroneous information by accident or to save time
* Third party and external information contains inconsistencies, inaccuracies, and errors

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| **AYK 2: MINING THE DATA WAREHOUSE** |

Alana will want to look at as many different dimensions of information as she can to begin to determine the issues with selling her product. Dimensions can include:

* Store location
* Time of sale
* Date of sale
* Product location
* Purchase amount
* Other products purchased
* Payment method
* Sales personnel involved with sale
* Customer gender
* Customer age
* Promotion
* Weather

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| **AYK 3: CLEANSING INFORMATION** |

There are a number of issues with the data in the spreadsheet. Students need to pinpoint the data along with potential methods for improving the quality. Each of these errors may or may not be issues, further analysis would be required.

* Incorrect customer IDs – 23362
* Inaccurate last names – Mikolajczk
* Inaccurate first names – Damanceee
* Inaccurate addresses – 1700 N
* Inaccurate city’s – Bethpage
* Missing Zip Codes

One way the student can check the addresses is to compare to the United States Posts Office which publishes a listing of accurate addresses. Many organizations use this resource to help ensure accurate addresses with correct zip codes.

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| **AYK 4: DIFFERENT DIMENSIONS** |

A relational database contains information in a series of two-dimensional tables. In a data warehouse and data mart, information is multidimensional, meaning it contains layers of columns and rows. For this reason, most data warehouses and data marts are multidimensional databases. A dimension is a particular attribute of information. Each layer in a data warehouse or data mart represents information according to an additional dimension.

Data mining is the process of analyzing data to extract information not offered by the raw data alone. For example, Ruf Strategic Solutions helps organizations employ statistical approaches within a large data warehouse to identify customer segments that display common traits. Marketers can then target these segments with specially designed products and promotions.

Data mining can also begin at a summary information level (coarse granularity) and progress through increasing levels of detail (drilling down), or the reverse (drilling up). To perform data mining, users need data-mining tools. Data-mining tools use a variety of techniques to find patterns and relationships in large volumes of information and infer rules from them that predict future behavior and guide decision making. Data-mining tools for data warehouses and data marts include query tools, reporting tools, multidimensional analysis tools, statistical tools, and intelligent agents.

**PROJECT ANALYSIS AND SOLUTION**

Student answers to this project will vary. The important part is their justification for each rating. Sample ratings could include:

**Dimension Value (1–5)**

Product number 1

Store location 1

Customer net worth 2

Number of sales personnel 2

Customer eating habits 5

Store hours 1

Sales person ID 1

Product style 1

Order date 2

Product quantity 2

Ship date 2

Current interest rate 3

Product cost 2

Customer’s political affiliation 5

Local market analysis 3

Order time 2

Customer spending habits 3

Product price 1

Exchange rates 2

Product gross margin 5

Season 2

Promotion 1

Payment method 2

Commission policy 3

Manufacturer 3

Traffic report 5

Customer language 5

Weather 4

Customer gender 3

Local tax information 3

Local cultural demographics 4

Stock market closing 3

Customer religious affiliation 5

Reason for purchase 2

Employee dress code policy 3

Customer age 3

Employee vacation policy 5

Employee benefits 5

Current tariff information 5

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| **AYK 5: UNDERSTANDING SEARCH** |

Student answers to these questions will vary depending on the students search preferences. There are a number of companies competing with Google including Ask.com, Alta Vista, and Yahoo. What qualifies as a good search engine depends on the types of searches and user’s preferences, which students will start to understand after performing this activity.

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| **AYK 6: PREDICTING NETFLIX** |

The way that Netflix analyzes data to gleam information for its customer recommendation system is simply amazing! First ask your students to visit the Netflix site and familiarize themselves with how the site works and how the recommendations are created. Ask them to backwards engineering how Netflix possible uses all of its customer feedback to create the list of the top five movies that are recommended based on a customer’s preference. The order of how Netflix creates intelligence could be as follows:

* **Database**: Broadly defined, a database maintains information about various types of objects (inventory), events (transactions), people (employees), and places (warehouses). A database management system (DBMS) creates, reads, updates, and deletes data in a database while controlling access and security. Netflix would use databases to gather customer information such as name, address, rental plan, frequency of renting, billing and all other customer information including location for mail pickup and if they have Internet access. Netflix would have a database that also tracks inventory such as DVDs including movie genre, rating, year, producer, type, actor information, etc. Another database would be for all accounting purposes including billing, payments received, and payments outstanding along with vendor purchases, payroll, and all other accounting requirements to run the business.
* **Data Warehouses:**  A data warehouse is a logical collection of information, gathered from many different operational databases, that supports business analysis activities and decision-making tasks. The primary purpose of a data warehouse is to combine information, more specifically, strategic information, throughout an organization into a single repository in such a way that the people who need that information can make decisions and undertake business analysis. A key idea within data warehousing is to collect information from multiple systems in a common location that uses a universal querying tool. This allows operational databases to run where they are most efficient for the business, while providing a common location using a familiar format for the strategic or enterprisewide reporting information. Netflix would use a data warehouse to store all of the information from its operational systems such as customer, billing, sales, marketing, and inventory.
* **Data Marts**: A data mart contains a subset of data warehouse information. To distinguish between data warehouses and data marts, think of data warehouses as having a more organizational focus and data marts as having a functional focus. Netflix could use data marts to gather precise information from marketing and sales to determine new and exciting marketing plans.

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| **AYK 7: THE CRUNCH FACTORY** |

This is a great activity to get your students considering global data requirements. As companies expand abroad the fundamental information systems that run the business need to be tweaked to handle all kinds of global dimensions such as different currency, taxes such as VAT, laws that require different information for bills or privacy standards, languages and different characteristics, etc.

* **Challenges associated with low-quality information:** An organization must maintain high quality information in the data warehouse. Information cleansing and scrubbing is a process that weeds out and fixes or discards inconsistent, incorrect, or incomplete information. Low quality information tends to have accuracy, completeness, relevance, and time issues. Without high quality information the organization will be unable to make good business decisions. Potential business effects resulting from low quality information include:
  + Inability to accurately track customers
  + Difficulty identifying valuable customers
  + Inability to identify selling opportunities
  + Marketing to nonexistent customers
  + Difficulty tracking revenue due to inaccurate invoices
  + Inability to build strong customer relationships – which increases buyer power
* **Benefits associated with high-quality information:** Business decisions are only as good as the quality of the information used to make them. Data inconsistency occurs when the same data element has different values. Take for example the amount of work that needs to occur to update a customer who had changed her last name due to marriage. Changing this information in only a few organizational systems will lead to data inconsistencies causing customer 123456 to be associated with two last names. Data integrity issues occur when a system produces incorrect, inconsistent, or duplicate data. Data integrity issues can cause managers to consider the system reports invalid and will make decisions based on other sources. The five characteristics common to high-quality information: accuracy, completeness, consistency, timeliness, and uniqueness.
* **Recommendations on how the company can clean up its data:** To ensure a firm manages its information correctly, it will need special policies and procedures establishing rules on how the information is organized, updated, maintained, and accessed. Every firm, large and small, should create an information policy concerning data governance. Data governance refers to the overall management of the availability, usability, integrity, and security of company data. A company that supports a data governance program has a defined a policy that specifies who is accountable for various portions or aspects of the data, including its accuracy, accessibility, consistency, timeliness, and completeness. The policy should clearly define the processes concerning how to store, archive, back up, and secure the data. In addition, the company should create a set of procedures identifying accessibility levels for employees. Then, the firm should deploy controls and procedures that enforce government regulations and compliance with mandates such as Sarbanes-Oxley.

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| **AYK 8: TOO MUCH OF A GOOD THING** |

The primary purpose of data warehouses and data marts are to perform analytical processing or OLAP. The insights into organizational information that can be gained from analytical processing are instrumental in setting strategic directions and goals. Databases contain information in a series of two-dimensional tables, which means that you can only ever view two dimensions of information at one time. In a data warehouse and data mart, information is multidimensional, it contains layers of columns and rows. Each layer in a data warehouse or data mart represents information according to an additional dimension. Dimensions could include such things as products, promotions, stores, category, region, stock price, date, time, and even the weather. The ability to look at information from different dimensions can add tremendous business insight.

An organization must maintain high quality information in the data warehouse. Information cleansing and scrubbing is a process that weeds out and fixes or discards inconsistent, incorrect, or incomplete information. Without high quality information the organization will be unable to make good business decisions. A data warehouse is an enabler of business intelligence. The purpose of a data warehouse is to pull all kinds of disparate information into a single location where it is cleansed and scrubbed for analysis.

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| **AYK 9: TWITTER BUZZ** |

There are so many great websites that share how Twitter works in the business environment. Here are a few I recommend sharing with your students:

* Twitter in Plain English <http://www.commoncraft.com/twitter>
* How to explain Twitter to your Grandma <http://www.methodshop.com/gadgets/tutorials/twitter-explained/index.shtml>
* Kevin Spacey tries to explain Twitter to David Letterman <http://www.crunchgear.com/2009/07/22/video-kevin-spacey-tries-to-explain-twitter-to-david-letterman/>

Social media tools really represent a double-edged sword in the business environment. If your business isn't on Twitter or Facebook you will lose out because your customers and more importantly your competitors are!!! However, employees can cause tremendous damage if they use these tools incorrectly!!!!!!!!! I think the best thing to do is to get educated on the tools and be sure to communicate - with written policies - how they are to be appropriately used at your business.

Here are a few resources to share your students on the dangers of social media in the business environment:

* The six hidden dangers of social media

<http://www.destinationcrm.com/Articles/CRM-News/Daily-News/The-6-Hidden-Dangers-of-Social-Media-69145.aspx>

* Real estate agents beware of social media

<http://tnupdate.wordpress.com/2011/02/15/real-estate-agents-beware-of-dangers-with-social-media/>

* The dangers of social media

<http://www.insurancenetworking.com/blogs/insurance_technology_social_media_security_risk_management-24021-1.html>

* How social media will change your business

<http://www.businessweek.com/bwdaily/dnflash/content/feb2008/db20080219_908252.htm>