

PART

# MIS and You

**This  
could happen  
to you**



Knowledge of information systems will be critical to your success in business. If you are planning on majoring in accounting, finance, marketing, human resources, or international business, you may not yet be aware of how important such knowledge will be. The purpose of Part 1 of this textbook is

to demonstrate why this subject is important to every business professional today.

We begin by considering a student, Madison, and the choices she is going to make as she ponders building a personal profile on the web. Madison's profile would be a collection of information about her that is available through the web. This information might include personal information (name, age, city, etc.) along with pictures, videos, music, and other files. Personal profiles are often organized in a social networking site such as Facebook ([www.facebook.com](http://www.facebook.com)) or MySpace ([www.myspace.com](http://www.myspace.com)), or a social messaging utility such as Twitter (<http://twitter.com>). These sites are called social networking sites or social messaging utilities because they provide Madison with the ability not only to create her own personal profile, but also to communicate with her friends, family, team members, and other web acquaintances who have similar sites.

Social networking sites are often free for the people who join. The businesses that operate these sites generate revenue primarily through paid advertisements or through providing special features or applications throughout the site to members who pay. The more people in the network, the greater the potential number of people viewing advertisements and the more valuable the site becomes. The most successful sites contain hundreds of millions of personal profiles from people across the globe. This can be an attractive market for many firms, such as music and movie distributors, looking for opportunities to raise the profile of their products.

Quite a few of Madison's student friends already have profiles on one or more of these sites. She has heard about the sites and is intrigued by the profiles and has even seen a few of the pages that her friends have set up. One day, Madison receives an email from one of her good friends, inviting her to build a personal profile and link to her friend's page. Since many people she knows have already joined the site and she knows the person who sent the invitation very well, it seems like a fun idea. But Madison faces a decision: Should she put her personal profile on the web?

In Part 1 of this book we are going to look at three different aspects of Madison's decision to put her personal profile on a social networking website. The first aspect is to consider her initial decision about joining the site. What should she include? Whom should she link to? We will also consider some surprises that she may encounter from publishing her profile.

The next time we meet Madison, in Chapter 2, she will be graduating and busy developing her résumé and applying for jobs. We will look at the hiring process, an important business process for many firms. We will then consider her web-based personal profile and how this might affect the hiring process. We'll find that Madison is in for a few more surprises.

We meet Madison again in Chapter 3, this time hard at work as a manager in the human resources department of a medium-sized high-technology company. We will explore how Madison uses information systems (including the web) to gain competitive advantage over other companies recruiting highly skilled workers. We will find that Madison relies heavily on information systems and the information they provide to consistently find talented people to work for her company.

Madison's journey illustrates why the knowledge in this class is vitally important to business professionals. Madison is a business manager. In university she majored in human resources. She is not an information systems professional, and she never thought she'd need to know how to manage the use of information systems. Yet that is exactly what her job requires her to do. This could happen to you!



# 1 Information Systems and You

**This  
could happen  
to you**



Madison decided that it would be fun to have her personal profile on the web. She accepted her friend's invitation to join a social networking site. She then got busy collecting photographs of her friends and some of her favourite places from her trips. She used a template provided by the site to fill in her name, age, country, and city. She included a little bit of information about her family, the soccer team she played with in high school, her interests in music, and her favourite movies. She also linked her site to a few friends so that they could share their information.

Madison may not have realized it at the time, but when she published her personal profile on the social networking site she became part of a worldwide information system. She did not build the system herself. She did not assemble any technology. She won't buy or write any computer programs. She did, however, provide information about herself and her friends that is stored electronically and is made available to anyone on the Internet. That may be a more important issue than Madison initially thought.

A few weeks after publishing her personal profile, Madison went to look at her site and found that she had been linked to a large number of "friends." She found the site useful for keeping in contact with people and spent some time every day on the site. She had recently received emails from some people who found her information on the site, but whom she had never even seen. She clicked on one of the friend's links and was surprised to see pictures of people who were very clearly partying. Some of the pictures bordered on being inappropriate. Others went far beyond that. Madison had just finished sending an invitation to her aunt to visit her site. She hoped her aunt wouldn't see the links that her friends had created, but she had limited control over what she could filter.

Madison started to think more carefully about her profile. What was her original objective? She thought it would be fun, but now it seemed like there was more to it than that. In the days that followed, Madison began to be more careful about the links she accepted. She also started to think about who was viewing the site. She read about the possibility of identity theft, when people use someone else's identity to purchase goods or rent cars, and that social networking sites were one of the places people use to steal information about a person's identity. She started to think about taking her page down, but she wasn't sure how to do that or whether it could be entirely removed. She also began to realize that





she was not necessarily in control of the information she put on the web. Her information—including her profile, pictures, and writing—could be viewed and used by almost anyone. She noticed that the social networking site had a link on the main page called “Privacy Protection” that she had previously clicked through without reading. She wished she had spent a few minutes looking at it before setting up her site.

Madison was realizing that there were important issues to consider before








becoming part of an information system.

Who would have thought that setting up a profile on the web would be so complicated?

As you have seen, Madison received some benefits from using the site, but was also confronted with some developments she did not anticipate. She had a need for knowledge that she may not have had when she first published her profile. Madison’s lack of knowledge could hurt her. Her lack of foresight is understandable, but improved knowledge of issues in MIS (management information systems) would have improved her ability to foresee some of these issues and to limit or reduce her risk. Her lack of knowledge may lead to a few sleepless nights worrying about her personal profile, but it did not have to be that way. Madison just needed to have some of the knowledge



## Study Questions

-  **1** What is an information system?
-  **2** What is MIS?
-  **3** How does IS differ from IT?
-  **4** How important are IS to our economy?
-  **5** How do successful business professionals use IS?
-  **6** What is the shape of things to come?
-  **7** What is this class about?

you are about to obtain in this course.

In this chapter, we start with the basic questions: What is an information system? What are management information systems? How important are information systems to our economy? What opportunities are available if you learn more about information systems? You should have a good idea, by the end of this chapter, why knowledge about information systems is critical to your success as a future business professional.

## Q I What Is an Information System?

A *system* is a group of components that interact to achieve some purpose. As you might guess, an **information system (IS)** is a group of components that interact to produce information. That sentence, although true, raises another question: What are these components?

Figure 1-1 shows the **five-component framework** of **computer hardware, software, data, procedures, and people**. These five components are present in every information system, from the simplest to the most complex. For example, when you use a computer to write a report, you are using hardware (the computer, storage disk, keyboard, and monitor), software (Microsoft Word, or some other word-processing program), data (the words, sentences, and paragraphs in your report), procedures (the methods you use to start the program, enter your report, print it, and save and back up your file), and people (you). These five components are all linked together through networks. Similarly, social networks join people together, and computer networks such as the Internet tie software, hardware, and data together to make information more accessible and powerful.

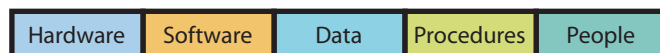
In the past, the term *software* was used to refer to computer components that were not hardware (e.g., programs, procedures, and user manuals). Today, the term software is used more specifically, to refer only to programs (or **applications**), and that is how we use the term throughout this book.

Consider a more complex example—say, an airline reservation system. It, too, consists of these five components, even though each one is far more complicated. The hardware comprises dozens or more computers linked together in a network by telecommunications hardware. Further, hundreds of different programs coordinate communications among the computers, and still other programs perform the reservations and related services. Additionally, the system must store millions upon millions of pieces of data about flights, customers, reservations, and other facts. Hundreds of different procedures are followed by airline personnel, travel agents, and customers. Finally, the information system includes people—not only the users of the system, but also those who operate and service the computers, those who maintain the data, and those who support the networks of computers.

The five components and the networks that surround them in Figure 1-1 are common to all information systems. For example, the social networking site Madison joined requires hardware, software, and internet connections to operate. People adding their personal information, pictures, videos, and other files provide the data. The procedures for joining the site, making links, and protecting privacy are other important elements. Some of these procedures are embedded in the software; other procedures, such as privacy protection, are written down to guide users on the appropriate use of the site. Procedures do not have to be written down, of course. In many information systems, people are assumed to understand at least some of the procedures.

Finally, people are involved throughout the system. There are the people who use the site. There are the IS professionals who build and maintain the site, and there are the people who sell advertising on the site. All these people are part of the system. *An important point to learn in this class is that people are often the*

**Figure 1-1**  
Five Components of  
an Information System



*most critical part of an information system. Information systems are not just computers and data.*

Before we move forward, note that we have defined an information system to include a computer. Some people would say that such a system is a **computer-based information system**. They would note that there are information systems that do not include computers, such as a calendar hanging on the wall outside a conference room that is used to schedule the room's use. Such systems have been used by businesses for centuries. Although this is true, in this book we focus on computer-based information systems. To simplify and shorten the book, we will use the term *information system* as a synonym for *computer-based information system*.

## What Is MIS?

There are millions of information systems, and not all relate to business. In this book, we are concerned with **MIS**, or **management information systems**. MIS is the development and use of information systems that help businesses achieve their goals and objectives. This definition has three key elements: *development and use, information systems, and business goals and objectives*. We have just discussed information systems. Now let's consider development and use and business goals and objectives.

### Development and Use of Information Systems

Information systems do not pop up like mushrooms after a hard rain; they must be constructed. You may be saying, "Wait a minute. I'm a finance (or accounting, or marketing) major, not an information systems major. I don't need to know how to put together information systems."

If you are saying that, you are like a lamb headed for fleecing. Throughout your career, in whatever field you choose, you will need new information systems. To have an information system that meets your needs, you need to take an *active role* in that system's development. Without active involvement on your part, it will be only good luck that causes the new system to meet your needs.

To that end, throughout this book we will discuss your role in acquiring information systems. In addition, we devote all of Chapter 11 to this important topic. As you read this text and think about information systems, you should ask yourself questions such as "How was that system constructed?" and "What roles did the actual people who will use it play in its development?" If you start asking yourself these questions now, you will be better prepared to answer them once you start a job, when financial, career, and other consequences will depend on your answers.

In addition to helping choose and implement information systems, you will have important roles to play in the *use* of information systems. Of course, you will need to learn how to employ the system to accomplish your goals. But you will also have other important functions. For example, when using an information system, you will be responsible for protecting the security of the system and its data. You may also have to back up data, to protect the organization from losing important information. When the system fails (and most do, at some point) you will have tasks to perform while the system is down, as well as helping to recover the system quickly and correctly.



## Social Media: Changing the Relationship between Customers and Business

Social media connect people, and when people get connected they talk, share, and let friends know what they think about the world. When instant messaging (IM), web logs (blogs), wikis, video logs (Vlogs), podcasts, and social networking (SN) sites first became popular, many business organizations responded by simply passing them by. From a pure accounting perspective, SN sites did not, and still do not, make for positive cash flows, and hence it seemed that there were few good business reasons to consider social

media. Some organizations therefore limited access to IM and SN sites because they did not want employees wasting time at work on these sites. Some organizations even created policies that restrained employees from responding to blogs about the company.

It wasn't too long before companies learned that ignoring social media could be bad for business. For example, Dell, a large computer manufacturer, ran into difficulty when one of its customers, Jeff Jarvis, who also happened to be the creator of *Entertainment Weekly*, became unhappy with Dell's customer service and posted letters on his blog, BuzzMachine, about his struggles. The result was a small storm of bad publicity for Dell. To its credit, Dell responded positively to the criticism by changing its policies, and it began listening and responding to customers with its Direct2Dell blog and IdeaStorm project. Dell, of course, was not alone. Even networking sites such as Facebook and MySpace, and social messaging utilities such as Twitter, have had to learn to deal with the influence that connected individuals can bring to bear on organizations.

### Some Examples of Using Social Media

As social media mature, organizations are formulating strategies that incorporate blogs, wikis, and SN sites into their business practices. For example, Scotiabank

## Achieving Business Goals and Objectives

The last part of the definition of MIS is that information systems exist to help businesses achieve their *goals and objectives*. First, you should realize that this statement hides an important fact: Businesses themselves do not “do” anything. A business is not alive, and it cannot act. It is the people within a business who sell, buy, design, produce, finance, market, account, and manage. So information systems exist to help people who work in a business achieve the goals and objectives of that business.

Information systems are not usually created for the sheer joy of exploring technology. They are not created so that the company can be “modern” or so that the company can claim to be a “new-economy company.” They are not created because the information systems department thinks they need to be created or because the company is “falling behind the technology curve.”

This point may seem so obvious that you wonder why we mention it. Every day, however, some business somewhere is developing an information system for the wrong reasons. Right now, somewhere in the world, a company is deciding to create a website for the sole reason that “every other business has one.” This company is not asking important questions such as “What is the purpose of the

has taken its traditional newsletter further with the introduction of the Money Clip (<http://themoneyclip.scotiabank.com>), which is a site that provides a series of podcasts. These podcasts let people listen to experts on a variety of topics, including investing, retirement planning, home ownership, and small business. Another example is Molson in the Community (<http://blog.molson.com/community>), which provides a place for staff to share the work they do on behalf of Molson Canada in communities across the country. This site contains blogs and Vlogs about the staff's volunteer work. The Big Wild ([www.thebigwild.org](http://www.thebigwild.org)) was founded by the Canadian Parks and Wilderness Society (CPAWS) and Mountain Equipment Co-op to allow people to share pictures and videos of wild spaces and to connect with others who are interested in preserving these spaces.

### What About Small Business?

The examples above are all large organizations, but perhaps the most exciting thing about social media has been its impact on small business. Mabel's Labels, a company based in Hamilton, is a great example of how a small company can effectively use social media. Mabel's Labels has a blog called The Mabelhood ([www.blog.mabel.ca](http://www.blog.mabel.ca)), a podcast series on parenting, a Facebook fan page, a Twitter account (mabelhood),

a photostream in Flickr, and a YouTube account. All of these social media channels help Mabel's Labels connect with customers and increases the size of the network familiar with their products. Social media are changing the way small business connects with its customers and that is a message that businesses everywhere are listening to.

### Questions

1. Are the social media sites that Mabel's Labels uses information systems?
2. What are the benefits and costs to Mabel's Labels participation in their various social media sites?
3. Can larger companies do the same social media marketing and promotion that Mabel's Labels can? Do small businesses have an advantage in social media over larger organizations? Justify your answers.
4. What risks does Mabel's Labels face in its social networking strategy; that is, what are the downsides to using social media for small businesses?
5. Social networking sites do not make money and for this reason they may be a fad that will eventually be absorbed by other more profitable companies. Is social networking something that will last?

website?" or "What is it going to do for us?" or "Are the costs of the website sufficiently offset by the benefits?"—but someone in the company should be asking those questions!

Even more seriously, somewhere right now a business manager has been convinced by a software vendor's sales team or by an article in a business magazine that his or her company must upgrade to the latest, greatest high-tech gizmo or application. This manager is attempting to convince his or her manager that this expensive upgrade is a good idea. We hope that someone, somewhere, in the company is asking questions such as "What business goal or objective will be served by the investment in the gizmo?"

Throughout this book, we will consider many different information system types and underlying technologies. We will show the benefits of those systems and technologies, and we will illustrate successful implementations of each. The "*MIS in Use*" cases provided throughout the book discuss information systems in real-world organizations. As a future business professional, you need to learn to look at information systems and technologies only through the lens of *business need*. Learn to ask, "All this technology may be great in and of itself, but what will it do for us? What will it do for our business and our particular goals? Is it worth the investment?"



Again, MIS is the development and use of information systems that help businesses achieve their goals and objectives. Already you should be realizing that there is much more to this class than buying a computer, writing a program, or working with a spreadsheet.

## Q3 How Does IS Differ from IT?

*Information technology* and *information system* are two closely related terms and although they are often used interchangeably, they are different. **Information technology (IT)** refers to methods, inventions, standards, and products. As the term implies, IT refers to raw technology, and it concerns only the hardware, software, and data components of an information system and how these are networked together. In contrast, an information system is a system of hardware, software, data, procedures, and people that produces information.

IT, by itself, will not help an organization achieve its goals and objectives. It is only when IT is embedded into an IS—only when the technology within the hardware, software, and data is combined with the people and procedure components—that IT becomes useful.

Think about these statements from the standpoint of the information systems at your university. Do you care that the university network uses the latest, greatest technology to send messages across campus? Do you care that the university's website uses the latest, fastest hardware to show you available classes? Not really. It is only when the humans at the university (including you) use procedures to do something—to enroll in a class, for example—that the IT becomes useful to you.

Consider Madison and her original objective to set up her personal profile. She will use IT, but that is not her primary interest. Her goal is to combine the hardware, software, data, and procedures with people to make her experience on the social networking site enjoyable. The people are the most important part of the system for users like Madison.

So the real difference between information technology and information systems is that IS includes people in the equation. And it turns out that if you include people and the way that they work in how you think about information systems, it makes a *big* difference in how you design and implement systems. Successful business people understand this crucial difference between IT and IS, and they take advantage of it, as we show in this chapter.

## Q4 How Important Are IS to Our Economy?

Information systems are an increasingly important part of the Canadian economy. Industry Canada<sup>1</sup> is the federal government agency responsible for categorizing industry sectors and collecting information about them. The industry sector most closely related to the use of information systems in Canada is the **Information and Communications Technologies (ICT) sector**.<sup>2</sup> This industry sector is special because it provides products and services that other industries, such as retail, manufacturing, insurance, or banking, rely on to get their work

<sup>1</sup> [www.ic.gc.ca](http://www.ic.gc.ca)

<sup>2</sup> <http://strategis.ic.gc.ca/epic/site/ict-tic.nsf/en/Home>

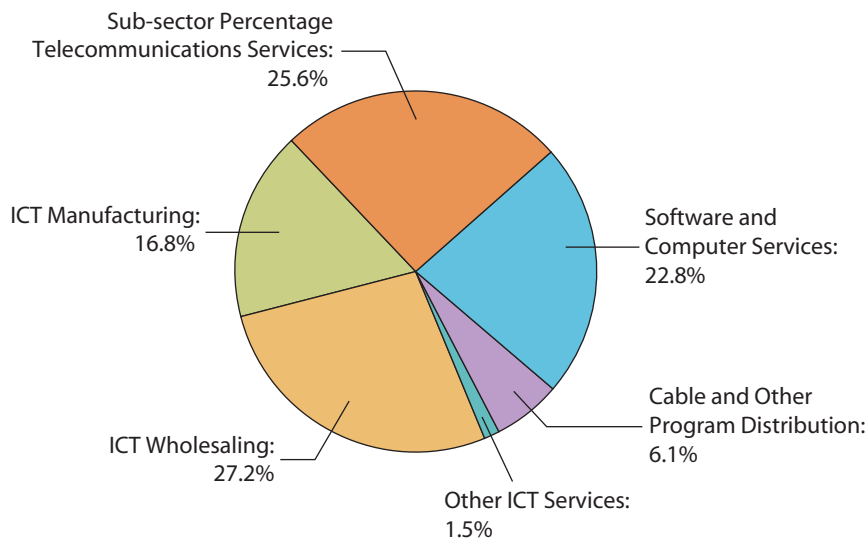
done. For many people, the ICT sector is a “hidden” industry. Would it surprise you to know that the ICT industry, plus ICT professionals working in other industries, comprise nearly 1.1 million Canadian workers? In fact, according to the Canadian Coalition for Tomorrow’s ICT Skills, more people work in ICT than in agriculture, forestry, fishing, mining, oil and gas, utilities, and the transportation industry (including auto manufacturing) combined.<sup>3</sup> The ICT industry sector includes companies involved in software and computer services, cable and other program distributors, telecommunication services, ICT manufacturing, and ICT wholesaling. Figure 1-2 shows the percentage of total revenues associated with these sector categories.

In 2009, the Canadian ICT sector included nearly 30 000 companies. Most of these companies—more than 97 percent—had fewer than 100 employees. In 2008, only 120 of the companies in the ICT sector had more than 500 employees.<sup>4</sup>

In 2008, the ICT sector collected over \$150 billion in revenue. This accounts for 4.7 percent of Canadian economic output. On average, annual growth in this sector has been 5.1 percent since 2002, a growth rate this is almost twice as high as the overall economy (2.7 percent). This faster growth means that the ICT industry sector has accounted for 8.3 percent of Canada’s GDP growth since 2002. This growth is displayed in Figure 1-3.

So what should all these numbers mean to you? In a word, *jobs*. The total number of workers in the ICT industry rose from 442 510 to 592 636 between 1997 and 2007. So where are the jobs? Most of the employment gains have occurred in the software and computer-services industries. These service industries include software publishers, business-communications services, data processing, computer system design and related services. More than 420 000 Canadians worked in the ICT services industries in 2007, accounting for approximately 71 percent of all ICT-sector employment. Over 223 000 Canadians worked in computer system design and related services. By contrast, employment in the ICT manufacturing industries has declined by 20 percent over the same period.

What we learn from these employment numbers is that there will likely be more jobs in the future in what are termed “service” industries. These are



**Figure 1-2**  
Revenues by ICT Sub-Sector,  
2007

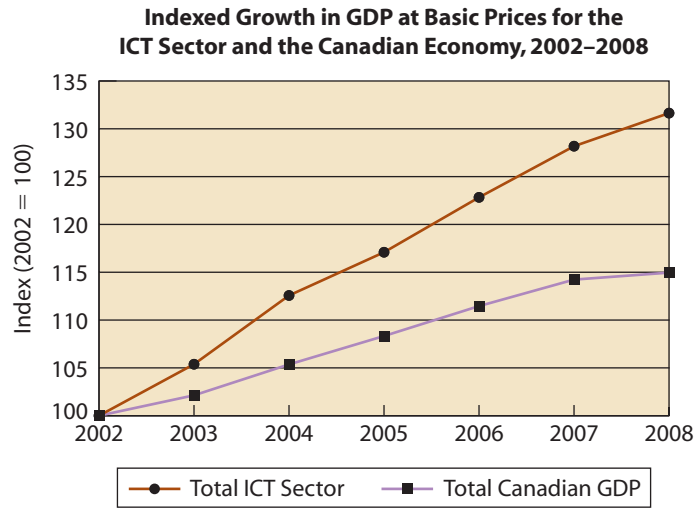
Source: Courtesy of Industry Canada. Reproduced with the permission of the Minister of Public Works and Government Services, 2009.

<sup>3</sup> See description for challenge located here: [www.ccict.ca/challenge.html](http://www.ccict.ca/challenge.html)

<sup>4</sup> The facts and graphs provided in this section come from the Canadian ICT Sector Profile, updated February 2009 and located at [www.ic.gc.ca/eic/site/ict-tic.nsf/eng/h\\_it06155.html](http://www.ic.gc.ca/eic/site/ict-tic.nsf/eng/h_it06155.html).

**Figure 1-3**  
ICT Sector GDP, 2002–2008

Source: Courtesy of Industry Canada. Reproduced with the permission of the Minister of Public Works and Government Services, 2009.



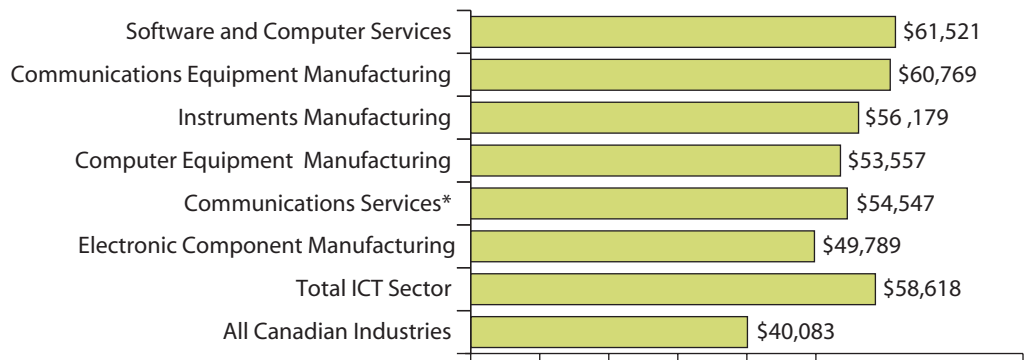
industries that do not produce products but instead supply services that improve business processes. These service companies help other companies, across almost every industry in Canada, more effectively use information systems. Even companies that make software are realizing that much of their revenue is based on services. In a recent study Cusumano (2008) noted that many large software development companies (such as Oracle and Seibel) derive more than half of their revenues from services they provide and not from the software products they produce.<sup>5</sup>

What all these numbers boil down to is that understanding how to choose and use information technology effectively is an increasingly important skill to have. You might be asking yourself, “Who are these people getting jobs in this industry, and what do they earn?” Employment in the ICT sector is characterized by a high level of education. In 2008, 43 percent of all ICT workers had a university degree; the Canadian workforce average is 23 percent. Fifty-three percent of employees in the software and computer services industries reported having a university degree; a further 29 percent had a college degree.

Figure 1-4 shows that employees in the ICT sector are relatively well paid. According to Industry Canada, workers in ICT industries earned on average \$58 618 in 2007, which is well above the economy-wide average of \$40 083.

**Figure 1-4**  
Average Annual Earnings by Major ICT Industry, 2007

Source: Courtesy of Industry Canada. Reproduced with the permission of the Minister of Public Works and Government Services, 2009.



\* Including Cable and Other Program Distribution.

<sup>5</sup> Michael A. Cusumano, “The Changing Software Business: Moving from Products to Services,” *Computer*, vol. 41, no. 1, pp. 20–27, Jan. 2008.

Employees in the software and computer services industries were the most highly paid, with average earnings of \$61 521.

So what does all this mean to you? The information presented in this section should help you to understand that information systems are an increasingly important part of our economy. In particular, the delivery of services (where people serve other businesses) is a growing area of employment. This employment can be financially rewarding, with higher-than-average salaries, but it is a very knowledge-intensive industry, in which more than half of all workers possess university degrees. Students in the Canadian economy who are working toward becoming business professionals cannot ignore the importance of understanding and working with information systems.

## **Q5** How Do Successful Business Professionals Use IS?

Today, every business professional uses numerous information systems. Most people are able to use email, access web pages, use word processors and spreadsheets, create presentations with PowerPoint, talk on a cell phone, and use instant messaging. While the ability to use such basic information systems is essential, that level of knowledge and use does not give anyone a competitive advantage in the workplace. To be effective in the economy we find ourselves in today, you will have to know how to do more than the basics. Business professionals need to expand their knowledge of mobile devices and applications that include project-management software (e.g., Microsoft Project, OpenProject), business graphics (e.g., MS Visio, SmartDraw), and collaborative systems such as Google Docs (<http://docs.google.com>).

But knowing how to use mobile devices and applications is just the first step. The most important task is to understand the technologies and businesses enough that you can identify opportunities for innovation through technology. And the really important question is, “What skills will be required for this?” Of course, a range of skills are necessary in any industry. Business majors with specializations in marketing, accounting, human resources, international business, and finance are developing core skills that will continue to be in high demand throughout the Canadian economy. But there is more you can do to give yourself a competitive edge.

This fact is demonstrated in reports produced by the Information and Communications Technology Council (ICTC) of Canada ([www.ictc-ctic.ca](http://www.ictc-ctic.ca)). In its October 2008 report, “Outlook on Human Resources in the ICT Labour Market: 2008-2015,” the ICTC lays out the challenge ahead for Canadian employers in this high-tech sector.<sup>6</sup> The report signals the rather dramatic need for individuals with a core set of skills, including:

- technical skills
- specific technology and industry experience
- satisfactory communications and other business skills

Look at the above list again. Does it say “communications and business skills?” That’s right. Even in a high-tech industry sector such as ICT, business skills are at the core of competitive advantage. So your business skills can take you further than you might think in these industries. But it gets even better.

<sup>6</sup> The report can be found at: [www.ictc-ctic.ca](http://www.ictc-ctic.ca).

The report also outlines the difference between the ICT industries and ICT *user* industries. The ICT user industries comprise companies, organizations, and public sector bodies that use ICT in their operations—in other words, all the industries other than those companies in the ICT sector. The report notes that in 2006, the ICT user industries employed an additional 226 318 persons who could be considered to be working in ICT occupations. That’s in addition to the more than 592 000 employees working within the ICT sector.

For business majors, this is an important measure to keep in mind. What it means is that by adding a little bit of technical knowledge to your skills portfolio, you increase your ability to work across a wide spectrum of industries. It seems that the combination of business and technology skills can open quite a few doors in the new Canadian economy.

You might ask, “What jobs will these skilled individuals do?” The report lists three occupations that the ICTC believes will have above-average growth rates:

- manager, computer and information systems
- information systems analysts and consultants
- user-support technicians

Managers, analysts, consultants—these look like business jobs, don’t they? Successful business professionals recognize that they can gain a competitive advantage and widen their opportunities by adding some technical knowledge to their business skills. The line between business and technology is rapidly blurring. *Business professionals need to consider IT and IS when they think about the problems and opportunities that confront a department or organization.*

To remain productive, organizations in the Canadian economy will have to innovate. Much of this innovation will be driven by information technology. To take advantage of this trend and be a part of the changes that are coming, you don’t have to be a software programmer, data administrator, or network guru. Rather, you need to develop your business skills and then learn to think creatively about challenges and opportunities in your business and organization, and how you can apply new technology and a knowledge of information systems to addressing these business needs.

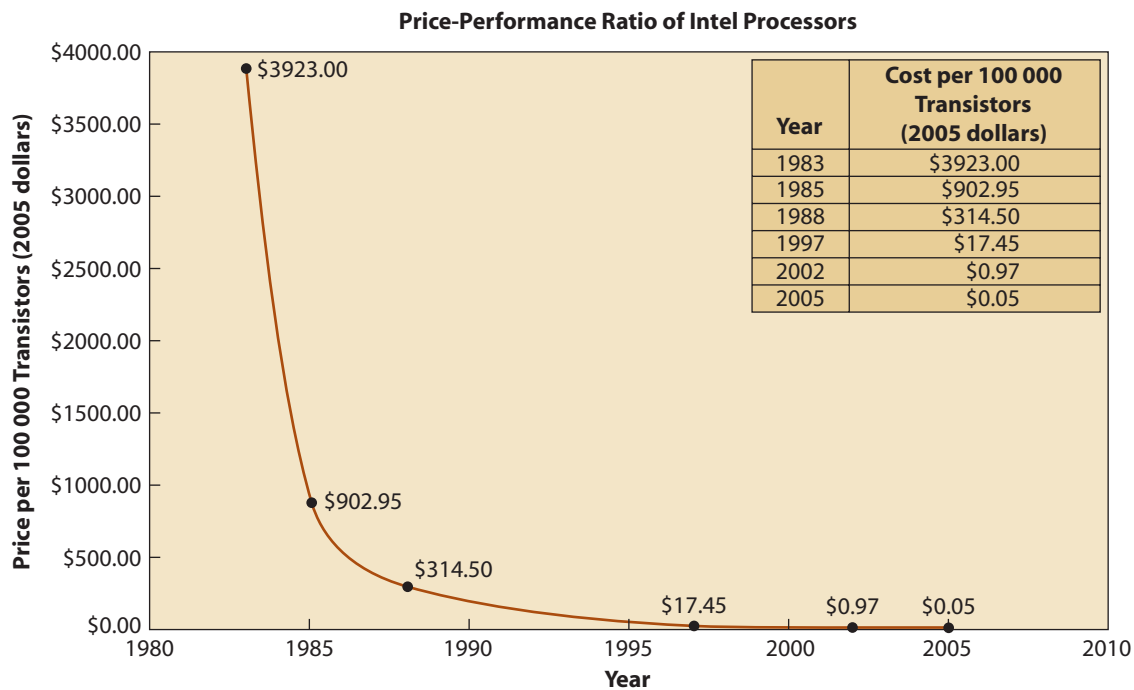
## What Is the Shape of Things to Come?

It is hard to predict the world of information technology. Gordon Moore is an electrical engineer and a co-founder of Intel, the company that introduced the world’s first microprocessor in 1971. In 1965, Moore published a short (four-page) article that appeared in the magazine *Electronics*:<sup>7</sup>

*The complexity for minimum component costs has increased at a rate of roughly a factor of two per year . . . . Certainly over the short term this rate can be expected to continue, if not to increase . . . . That means by 1975, the number of components per integrated circuit for minimum cost will be 65,000. I believe that such a large circuit can be built on a single wafer.*

This observation later became known as **Moore’s Law**. Moore’s Law, slightly augmented, predicts that the number of transistors on a computer chip would

<sup>7</sup> The report can be found at <ftp://download.intel.com/museum>.



**Figure 1-5**  
Computer  
Price/Performance  
Ratio Decreases

double roughly every two years (20 months). The amazing thing about this prediction is that it has proved generally accurate for more than 40 years. The reason we pay attention to Moore's Law is that it is one of the few predictions in the area of information technology that has really stood the test of time.

So why is the future of information technology so difficult to predict? The primary reason is that information technology is all about innovation, and innovation brings with it unexpected results. Few people, for example, would have predicted the popularity of the Apple iPod before it was introduced, or that of compact discs (CDs) in the era of cassette tapes. Once people saw these products and used them, however, the choice became clear. But the history of the IT industry is full of "can't-miss" ideas that somehow found a way to miss.

While IT certainly has a colourful history, in this book we are more interested in the business of IT and IS. The question we pose is, "How will the changes in IT and IS affect the way we live and work?" Hal Varian, chief economist at Google, provides some perspective on this question.<sup>8</sup> He suggests that business is changing because of advances in IS and IT and that business people need a better understanding of how IT can be used to support innovation.

For example, Varian suggests that mobility devices will change what it means to go to work. The work will come to you, wherever you are, and you will deal with your work at any time and any place using the networks that have become so readily available. He notes that for business people, the ability to handle data—find it, process it, understand it, visualize it, and then communicate it—is going to be an important skill for decades to come. Varian also notes that industries are undergoing significant change because of shifts in technology. For example, the traditional marketing industry (print, newspaper, television, radio) has to come to grips with the prevalence and potential of the Internet. This technological change affects how and where advertisers will spend their dollars. Traditional industries have to adapt to the changes at a pace that is faster than these industries are accustomed to. These topics are obviously

<sup>8</sup> The full Hal Varian interview (on how the web challenges managers) can be found at [www.mckinseyquarterly.com/Strategy/Innovation/Hal\\_Varian\\_on\\_how\\_the\\_Web\\_challenges\\_managers\\_2286](http://www.mckinseyquarterly.com/Strategy/Innovation/Hal_Varian_on_how_the_Web_challenges_managers_2286).



## Google Knows Best

Every day, millions of people worldwide log in to Gmail, Google's free web-based mail service. Launched four years ago, Gmail is supported entirely by advertising and can be considered a success by almost any standard. When email is sent or received, a fresh column of ads appear on the right-hand side of the screen. Write about a book, and ads for online bookstores pop up. Mention a camping trip, and you'll see canoe rentals in the area. The ads are chosen to be relevant to the content of the email.

The ability to scan email, understand its content, and provide contextual advertising is what distinguishes Gmail from other web-based email providers. Yahoo tracks what people view online and uses this data to customize ads; Hotmail displays banner ads based on demographic information provided when users register, and the geographic decoding of their IP addresses. But only Gmail attempts to understand what you are writing—the company calls it “content extraction”—in order to sell the data to advertisers. Google is tight-lipped about the details, but content extraction involves sophisticated algorithms that examine all information in a message, including the recipient's location and links to web pages and attachments.

Privacy experts say that, unlike the postal service, which does not read your letters, and telephone companies, which do not eavesdrop on your calls, Gmail is changing the role of the communication carrier and

violating democratic principles. Commenting on this example in *MacLean's*, Marc Rotenberg, Executive Director of the Electronic Privacy Information Center (EPIC) in Washington, said that “Gmail has broken a fundamental trust.” Other commentators go even further, suggesting that Google doesn't have a great track record on privacy. When you visit a Google site, your IP address is recorded and all your searches are tracked. Because Google can track users across its various products, it has the potential to create complex profiles, combining search terms and email information.

Sarah Elton, a Toronto journalist, discovered recently just how relevant the ads were when she wrote a Gmail email to a friend. Her message mentioned a pregnant woman whose husband had an affair. The Google ads didn't push baby gear and parenting books. Rather, Gmail understood that “pregnant” in this case wasn't a good thing because it was coupled with the word “affair.” So it offered the services of a private investigator and a marriage therapist.

### Questions

1. Do people who use free email systems understand the implications of the trade-offs that they have made? (Hint: Do you?)
2. Is email different from postal or telephone services? Is it more like a postcard, where privacy should not be assumed?
3. How complete a profile can Google assemble of a typical user? (Hint: what Google services—Calendar, Google Maps, etc.—do you use?)
4. Is there a way you could use free email systems yet still prevent your messages from being contextually scanned?
5. Should these forms of communication service be regulated? If so, how and by whom?
6. Is there a difference between what Google is doing and how spam filters work?
7. What are your privacy rights and expectations while using the Internet?

important for business students, and we will cover them in more detail throughout the book.

A view of the future is also provided by David Ticoll in his report “ICTS Jobs 2.0,” which was presented to the Information and Communications Technology Council of Canada.<sup>9</sup> Ticoll suggests that within the next decade, unlimited

<sup>9</sup> The report can be found at [www.ccict.ca/pdfs/Reports\\_briefs/Ticoll%20-%20Jobs-2-0.pdf](http://www.ccict.ca/pdfs/Reports_briefs/Ticoll%20-%20Jobs-2-0.pdf).

storage will be almost free, that analytical software will reveal hidden treasures, and that the real and virtual world will collide as wide-area networks become cheap, reliable, and widely available. He notes that these technology trends will enable deep, powerful, performance-enhancing innovations that will be felt in almost every industry.

So what does all of this talk about the future of information technology mean to you? It means that our Canadian economy is undergoing some fundamental changes, but that shifts have occurred before and they will occur again. When the world is shifting, the most important skill to develop is the ability to innovate and to adapt to the changing world around you. So rather than focus on learning specific technical skills that may fade in importance over time, this book will focus on providing you with the general knowledge that will enable you to quickly understand and adapt to technological changes that occur. Understanding the implications of technical change will allow you to be both a more effective business professional and a more flexible individual.

In many cases, the adaptations do not have to be dramatic. A sample innovation is shown in our Case Study 1 at the end of this chapter. In this case, a small retail store—The Running Room—that sells jogging and walking equipment uses the web to expand their business and increase their reach to customers. It may not be rocket science, but the case demonstrates how organizations can adopt technology to make better products and services for their customers and employees.

The effects of innovation can be difficult to predict and can lead to unintended consequences. For example, the “MIS in Use” case “Google Knows Best” describes an innovation that Google has created in order to tie advertising to the content generated in email. While the idea is the result of significant innovation, the change has implications on privacy and security that our society has yet to fully understand.

## 7 What Is This Class About?

Many students enter this class with an erroneous idea of what they will study. Often, students think of it as a computer class—or at least a class that has something to do with computers and business. Other students think that this class is about learning how to use Excel, Access, or some web development tool.

**Figure 1-6**  
Student Thoughts About “Why I Don’t Need This Class”

- “I already know how to use Excel and Word. I can build a website with FrontPage. Okay, it’s a simple website, but I can do it. And when I need to learn more, I can. So let me out of this class!”
- “We’re going to learn how to work with information systems? That’s like practising having the stomach flu. If and when the time comes, I’ll know how to do it.”
- “I’m terrified of computers. I’m a people person, and I don’t do well with engineering-like things. I’ve put this class off until the last quarter of my final year. I hope it’s not as bad as I fear; I just wish they didn’t make me take it.”
- “There’s really no content in this class. I mean, I’ve been programming since high school, I can write in C++, though PERL is my favourite language. I know computer technology. This class is just a bunch of management babble mixed up with some computer terms. At least it’s an easy class, though.”
- “Well, I’m sure there is some merit to this class, but consider the opportunity cost. I really need to be taking more microeconomics and international business. The time I spend on this class could be better spent on those subjects.”
- “The only thing I need to know is how to surf the web and how to use email. I know how to do those, so I just don’t need this class.”
- “What, you mean this class is not about learning Excel and FrontPage? That’s what I thought we were going to learn. That’s what I need to know. Why all this information systems stuff? How do I make a website? That’s what I need to know.”



Figure 1-6 lists a number of reasons students have given us when explaining why they don't need to take this class. As you can see, opinions vary on what the class is about.

By now, you should have an idea that this class is about much more than learning how to use applications such as Excel or Access. You may, in fact, use those programs in this class, but the focus will not be on learning what keys to push to make the program work as you want it to. Instead, the focus will be on *learning to use those tools to accomplish a business goal*.

Consider again the definition of MIS: the development and use of information systems that help organizations (and the people who work in them) accomplish their goals and objectives. Thus, to understand MIS, you need to understand both business and technology, and you need to be able to relate one to the other.

This book's table of contents will give you an idea of how we will proceed. In the next two chapters, we discuss the relationship of business processes and information systems, and we show how information systems can be used to gain competitive advantages. Then, in Chapters 4 to 6, you will learn about hardware, software, content, and databases, along with network and communications technology. With that foundation, in Chapters 7 to 9, we will show how technology can be used to gain a competitive advantage. Finally, in Chapters 10 to 12, you will learn how IT departments work, how the IT architecture is managed, about IS ethics and green IT, and about personal privacy and security. The Exercise "Duller Than Dirt?" at the end of this chapter on pages 22–23 shares our opinion about why these chapters—and this book—matter to you.



## Active Review

Use this Active Review to verify that you understand the material in the chapter. You can read the entire chapter and then perform the tasks in this review, or you can read the material for just one question and perform the tasks for that question before moving on to the next one.

### 1 What is an information system?

List the components of an information system. Explain how knowledge of these components will guide Madison's work as she builds her information system.

### 2 What is MIS?

List the three elements of MIS. Why does a non-technical business professional need to understand all three? Why are information systems developed? Why is part of this definition misleading?

### 3 How does IS differ from IT?

Define *IS*. Define *IT*. Does IT include IS or does IS include IT? Why does technology, by itself, not constitute an information system?

### 4 How important are IS to our economy?

What does ICT stand for? What percentage of GDP do ICT industries account for? Is the ICT sector

growing faster than the Canadian economy? Why are services of growing importance? How knowledge-intensive are these industries? What can an employee in the ICT industry expect to earn?

### 5 How do successful business professionals use IS?

With what new applications should a business professional be familiar? What combination of skills is of growing importance in the economy? Can a business student work in the ICT industry?

### 6 What is the shape of things to come?

Understand Moore's Law and the fundamental change that technology can bring to an economy, an organization, and you.

### 7 What is this class about?

In your own words, state what this class is about. Look at this book's table of contents. What major themes does it address? How will those themes relate to you as a business professional? If you were (or are) employed and you had to justify the expense of this class to your boss, how would you do it?

## Key Terms and Concepts

Applications	6	Information and communications		Moore's Law	14
Computer hardware	6	technology sector (ICT)	10	People	6
Computer-based information		Information system (IS)	6	Procedures	6
system	7	Information technology (IT)	10	Software	6
Data	6	Management information systems			
Five-component framework	6	(MIS)	7		

## Using Your Knowledge

- “Outlook on Human Resources in the ICT Labour Market: 2008–2015” suggests that ICT workers need to have several core skills.
  - What are these key skills?
  - Identify ways that a student could best obtain these skills.
  - Do you believe a business student can work effectively in the ICT industry? Would a business student have a competitive advantage over a computer science student? Why or why not?

2. The interview with Hal Varian, chief economist at Google, focuses on six themes: 1) flexible corporations, 2) corporations and work, 3) free goods and value, 4) workers and managers, 5) computer monitoring and risks, and 6) changes in industries. Choose one of these themes and discuss in more detail the implications of the change for you personally. Provide specific examples where possible. You can find the article at [www.mckinseyquarterly.com/Strategy/Innovation/Hal\\_Varian\\_on\\_how\\_the\\_Web\\_challenges\\_managers\\_2286](http://www.mckinseyquarterly.com/Strategy/Innovation/Hal_Varian_on_how_the_Web_challenges_managers_2286).
3. Consider the costs of a system in light of these five components: the costs to buy and maintain the hardware; the costs to develop or acquire licences to the software programs and to maintain them; the costs to design databases and fill them with data; the costs to develop procedures and keep them current; and, finally, the human costs, both to develop and use the system.
  - a. Over the lifetime of a system, many experts believe that the single most expensive component is people. Does this belief seem logical to you? Explain why you agree or disagree.
  - b. Consider a poorly developed system that does not meet its defined requirements. The needs of the business do not go away, but they do not conform to the characteristics of the poorly built system. Therefore, something must give. Which component picks up the slack when the hardware and software programs do not work correctly? What does this say about the cost of a poorly designed system? Consider both direct money costs as well as intangible personnel costs.
  - c. What implications do you, as a future business manager, recognize after answering questions (a) and (b)? What does this say about the need for your involvement in requirements and other aspects of systems development? Who will eventually pay the costs of a poorly developed system? Against which budget will those costs accrue?

## Collaborative Exercises

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1. Watch the video “Did You Know 3.0” ([www.youtube.com/watch?v=jpEnFwiqdx8](http://www.youtube.com/watch?v=jpEnFwiqdx8)). Discuss this video with your group and identify three specific impacts that you think the information in this video will have on your business career. Be as specific as possible, and link the ideas to your intended major, interests, and career aspirations.
2. Watch the video “A Vision of Students Today” ([www.youtube.com/watch?v=dGCJ46vyR9o](http://www.youtube.com/watch?v=dGCJ46vyR9o)). Discuss this video with your group and identify three ways that courses could be designed to improve the way students engage in the course. Be as specific as possible and be prepared to share your ideas with the class.

## Case Study 1

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### *Running at the Speed of the Web: The Running Room*

The Running Room ([www.runningroom.com](http://www.runningroom.com)) is North America’s largest specialty retailer of sporting goods, apparel, and footwear for runners and walkers. The company operates over 90 corporately owned stores in Canada and the United States. The Running Room website was created in early 2000.

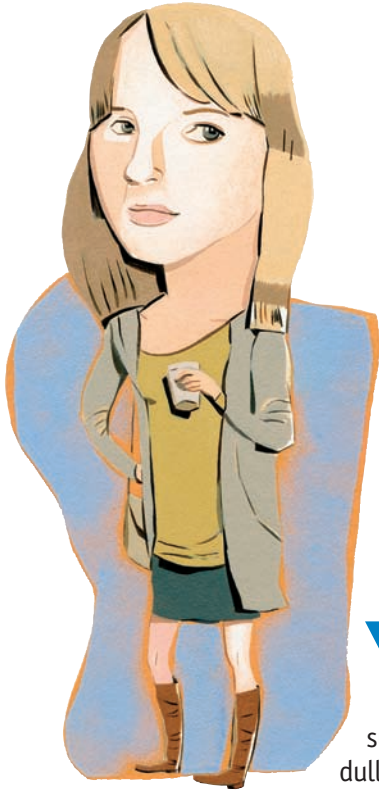
## Questions

1. Do you think The Running Room would be as successful as it is if it didn't have a website? In other words, is the company's website a critical component for success, or simply a nice "extra" for its customers?
2. Could The Running Room provide the same customer experience without using its website? For example, could the company use more mailings and telephone calls to stay in touch with its customers?
3. Do you think The Running Room's website creates a barrier to entry for its potential competitors? Explain your answer.
4. Check out The Running Room's mission statement. Does the website help the company meet these goals? Discuss why or why not.



Visit the MyMISLab website at [www.pearsoned.com/mymislalab](http://www.pearsoned.com/mymislalab). This online homework and tutorial system puts you in control of your own learning with study and practice tools directly correlated to this chapter's content.

# WHAT DO YOU THINK?



## Duller Than Dirt?

**Y**es, you read that title correctly: This subject can seem duller than dirt. Take the phrase *development and use of IS in organizations*.

Read just that phrase and you start to yawn, wondering, “How am I going to absorb almost 400 pages of this stuff?” Don’t worry. You’re not alone. Take a few minutes and look at this video: “A Vision of Students Today” ([www.youtube.com/watch?v=dGCJ46vyR9o](http://www.youtube.com/watch?v=dGCJ46vyR9o)).

Now stop and think: Why are you reading this book? Right now in the Sea of Cortez, the water is clear and warm, and the swimming and diving are wonderful. You could be kayaking to Isla San Francisco this very minute. So why are you here, reading this book? Why aren’t you there?

Suppose you take an hour tonight to read your assigned chapter in this book. For a typical person, that is 4320 heartbeats (72 beats times 60 minutes) you have used to read this book—heartbeats you will never have again. For some reason, you chose to major

in business. For some reason, you are taking this class. And, for some reason, you have been instructed to read this textbook.

Now, given that you made a good decision to major in business, the question becomes, “How can you maximize the return on the 4320 heartbeats you are investing each hour?” The secret is to personalize the material. At every page, ask yourself, “How does this pertain to me? How can I use this to further my goals?”

MIS is all-encompassing. To us, that’s one of its beauties. Consider the components: hardware, software, data, procedures, and people. Do you want to be an engineer? Then work the hardware component. Do you want to be a programmer? Write software. Do you like people? Become an IS trainer or a computer-systems salesperson. Do you like business systems and sociology? Learn how to design effective organizational procedures. Do you enjoy management? Learn how to bring all of those disparate elements together. We’ve worked in this industry for many years. The breadth of MIS and the rapid change of technology have kept us fascinated for every one of those years.



So wake up. Why are you reading this? How can you make it relevant? Jump onto Google and search for business-analyst or project-management careers, or use some other phrase from this chapter and see what you get. Challenge yourself to find something that is important to you personally in every chapter.

You just invested 780 heartbeats in reading this editorial. Was it worth it? Keep asking!



## DISCUSSION QUESTIONS

1. Are you awake to your life? How do you know? What can you do once a week to ensure that you *are* awake?
2. What are your professional goals? Are they yours, or are they someone else's? How do you know?
3. How is this class relevant to your professional goals?
4. How are you going to make the material in this class interesting?