CHAPTER 2: CONNECTIVITY

Networks and telecommunications are the transmission of signals over a distance for the purpose of communication. In modern times, this process almost always involves the sending of electromagnetic waves by electronic transmitters, but in earlier years it may have involved the use of smoke signals, drums or semaphore. Today, network and telecommunication is widespread and devices that assist the process such as the television, radio and telephone are common in many parts of the world. There is also a vast array of networks that connect these devices, including computer networks, public telephone networks, radio networks and television networks. Computer communication across the internet, such as email and instant messaging, is just one of many examples of telecommunication.

SECTION 2.1:
THE BUSINESS VALUE OF A CONNECTED WORLD

- **Overview of a connected world**
- **Benefits of a connected world**
- **Challenges of a connected world**

SECTION 2.2:
BUSINESS AND THE INTERNET

- **Disruptive and sustaining technologies**
- **Characteristics of Web 2.0**
- **Networking communities with Business 2.0**
- **Business 2.0 Tools for collaborating**
- **Web 3.0: Defining the next generation of online business opportunities**

SECTION 2.1 THE BUSINESS VALUE OF A CONNECTED WORLD

LEARNING OUTCOMES

Learning Outcome 2.1: Identify the benefits of a connected world.

Learning Outcome 2.2: Identify the challenges of a connected world.

Wireless technologies are transforming how we live, work, and play. Handheld devices are continuing to offer additional functionality and cellular networks are advancing rapidly in their increased speed and throughput abilities. These enabling technologies are fuelling widespread adoption and creation of new and innovative ways to perform business.

Learning Outcome 2.1:
Identify the benefits of a connected world.

Before networks, transferring data between computers was time-consuming and labour intensive. People had to physically copy data from machine to machine using a disk. Networks offer many advantages for a business including:

- sharing resources
- providing opportunities
- reducing travel.

Classroom opener 1

How the internet infrastructure works

Start the class by asking students who understands how the internet works. How does email go from the University of Sydney to the University of Melbourne? Or how does a web page go from client to server back to client?

For an overview of how the internet infrastructure works, including diagrams and easy-to-understand explanations, go to:

http://computer.howstuffworks.com/internet-infrastructure.htm

Classroom opener 2

Paywalls and the business future of newspapers

The Economist magazine and Jay Rosen debate the effects of the internet on journalism:

www.youtube.com/watch?v=HHJ8kT167RI[50]

See also the Opening Case Study in Chapter 2 of the textbook.

Class exercise 2.1 (LO 2.1)

Changing the world using mass collaboration online

Don Tapscott and Anthony D. Williams, co-authors of *Macrowikinomics: New solutions for a connected planet,* talk about using mass collaboration via technology to launch innovative ways to change society and business:

http://youtu.be/rK4If-FFjW8[51]

Class exercise 2.2 (LO 2.1)

Showing TV news viewers where the stories are happening by using Google Earth

This video shows how News TV programs use Google Earth to help viewers locate and visualise news stories:

www.gearthblog.com/blog/archives/2012/07/using_google_earth_to_geo_relevance.html[52]

Learning Outcome 2.2:
Identify the challenges of a connected world.

Networks have created a diverse, yet globally connected world. By eliminating time and distance, networks make it possible to communicate in ways not previously imaginable. Even though networks provide many business advantages, they also create increased challenges in (1) security and (2) social, ethical and political issues.

Videos (LO 2.2)

Save the Elephants uses GPS to track elephants

What are the dangers of poachers using this information to track the elephants?

www.savetheelephants.org/video.php?file=gps[53]

Wikileaks

Wikileaks has changed the way we find information by releasing information from government sources without permission or controls.

http://wikileaks.org[54]

Classroom exercise 2.3 (LO 2.2)

Click fraud

Have students read the following articles:

- In 'Challenge To Google, Microsoft Pays $6 Billion For Online Advertising Firm', Microsoft ties to grab a larger piece of the online advertising market in 2007: www.informationweek.com/news/showArticle.jhtml?articleID=199601932[55]
- Then it writes off almost the entire cost of the acquisition in 2012—'Microsoft's $6 billion whoopsie': http://money.cnn.com/2012/07/02/technology/microsoft-aquantive/index.htm[56]
- Overcharging per click and Microsoft: www.mediapost.com/publications/article/178632/microsoft-sued-for-overcharging-pay-per-click-mark.html[57]
- Microsoft and click fraud: http://blogs.technet.com/b/microsoft_on_the_issues/archive/2009/06/15/using-enforcement-to-crack-down-on-click-fraud.aspx[58] http://blog.clickdimensions.com/2012/02/protect-yourself-with-a-click-fraud-detection-dashboard.html[59]

Classroom exercise 2.4 (LO 2.2)

On a wing and a prayer, the Dalai Lama tweets to the Chinese

Hearing from His Holiness the Dalai Lama (HHDL, or Tenzin Gyatso to his friends) about, say, his anti-establishment stance on Tibetan autonomy is tricky for mainland Chinese citizens, thanks to the strict national control over media and censorship of China's internet ties to the outside world.

But the Dalai Lama has found a fabulously geeky way to get his opinions broadcast on the mainland. He's had a verified Twitter account in his name for quite some time, and several times a day it's a vehicle for some of his thoughts, musings, observations about life and news stories about where he's been or who he's spoken to. One tweet is pretty representative: 'Meeting so many people from all over the world and from every walk of life constantly reminds me of our basic sameness as human beings.'

Ask students to read the following article and answer the following questions:

- Explain the issues surrounding the Dali Lama's tweets in China.
- Do you agree or disagree with China's censorship?
- How are networks and technologies limiting a government's ability to censor?

www.fastcompany.com/1650516/dalai-lama-china-tweet-twitter-google-social-networking-green-wall-censorship?partner=rss[60]

PowerPoint presentations

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.

SECTION 2.2 BUSINESS AND THE INTERNET

LEARNING OUTCOMES

Learning Outcome 2.3: Compare disruptive and sustaining technologies, and explain how the internet and www caused business disruption.

Learning Outcome 2.4: Explain Web 2.0 and identify its four characteristics.

Learning Outcome 2.5: Explain how Business 2.0 is helping communities network and collaborate.

Learning Outcome 2.6: Describe the three Business 2.0 tools for collaborating.

Learning Outcome 2.7: Describe Web 3.0 and the next generation of online business.

Section 2.2 discusses different business departments and how the internet and e-business is affecting each. This is a great opportunity for instructors to discuss how learning about technology can impact people's careers and help them achieve success. Opening student's eyes to how technology can help them in their marketing, finance, accounting and other careers can even help students become more engaged in the course and perhaps elect MIS as their major or minor.

Learning Outcome 2.3:
Compare disruptive and sustaining technologies, and explain how the internet and www caused business disruption.

Disruptive technologies offer a new way of doing things that initially does not meet the needs of existing customers. Disruptive technologies redefine the competitive playing fields of their respective markets, open new markets and destroy old ones, cut into the low end of the marketplace and eventually evolve to displace high-end competitors and their reigning technologies. Sustaining technologies produce improved products that customers are eager to buy, such as a faster car or larger hard drive.

Classroom opener 3

GREAT BUSINESS DECISIONS – Jeff Bezos decides to sell books over the internet

Jeff Bezos owns 41 per cent of Amazon and is estimated to be worth over $900 million. Bezos graduated from Princeton and was the youngest vice president at Banker's Trust in New York. Bezos had to make a decision to stay and receive his 1994 Wall Street bonus or leave and start a business on the internet. 'I tried to imagine being eighty years old, looking back on my life. I knew that I would hardly regret having missed the 1994 Wall Street bonus. But having missed being part of the Internet boom—that would have really hurt,' stated Bezos. The first books ordered through Amazon were dispatched in the fall of 1994 (personally packaged by Bezos and his wife). Amazon.com is now the biggest bookstore on the planet. It is the exemplar of electronic business.

Classroom exercise 2.5 (LO 2.3)

Twenty-five startups from 2007—where are they now?

It's getting crowded on the Web 2.0 frontier, but there are still some startups that truly stand out. *Business 2.0* magazine identifies the ones most likely to strike gold in 2007:

http://money.cnn.com/galleries/2007/biz2/0702/gallery.nextnet.biz2/index.html[61]

I like to discuss the funding for these start-ups. For example, the average funding for enterprise e-business start-ups were $33 million. It is a great way to show students how much money is being invested in IT. I also like to reflect on where these startups are today—is what we thought was hot in 2007 still hot? Ask the students to find out from the web where the 2007 hot businesses are now going. What happened to the 'hot' companies? What companies are hot today? How can you identify new trends?

Classroom exercise 2.6 (LO 2.3

Bad bosses collaboration

Below is an interesting website with stories on bad bosses – a great example of the power of collaboration!

www.workingamerica.org/badboss [62]

Classroom exercise 2.7 (LO 2.3)

Fair use of the net

World Fair Use Day seminar on hip hop and fair use video:

http://youtu.be/4_T9RgpUR_c[63]

Videos (LO 2.3)

e-Business disruption of traditional industries

Entertaining animated video showing emerging and disruptive technologies:

http://youtu.be/gVhifG3Czo8[64]

Cloud benefits

How the Cloud technology can benefit publishers by providing cost-effective solutions:

http://youtu.be/4WTx1bnmodI[65]

Learning Outcome 2.4:
Explain Web 2.0 and identify its four characteristics.

Web 2.0, or Business 2.0, is the next generation of internet use—a more mature, distinctive communications platform characterised by new qualities such as collaboration, sharing and free. Web 2.0 encourages user participation and the formation of communities that contribute to the content. In Web 2.0, technical skills are no longer required to use and publish information to the World Wide Web, eliminating entry barriers for online business. The four characteristics of Web 2.0 include content sharing through open sourcing, user-contributed content, collaboration inside the organisation and collaboration outside the organisation.

Classroom exercise 2.8 (LO 2.4)

User-contributed content

Interesting paper on user-contributed content from 2008 but is still relevant:

www.iab.net/media/file/2008_ugc_platform.pdf[66]

The rise of mobile user-generated content and applications is discussed by Angelo Biasi at:
www.mobilemarketer.com/cms/opinion/columns/11792.html[67]

Learning Outcome 2.5:
Explain how Business 2.0 is helping communities network and collaborate.

A social network is an application that connects people by matching profile information. Providing individuals with the ability to network is by far one of the greatest advantages of Business 2.0. Social networking is the practice of expanding your business and/or social contacts by constructing

a personal network. Business 2.0 simplifies the way individuals communicate, network, find employment and search for information.

Classroom exercise 2.9 (LO 2.5)

The ten most creative people on Twitter

Fast Company ranked the ten most creative people on Twitter. Ask your students to review the slideshow demonstrating the ten most creative people on Twitter and answer the following:

- Rank the people in order form greatest to least creative—1 being greatest
- Which person do you think has the best creative ideas and explain why?
- Which person has the least creative idea and why?
- What other ways could you use Twitter for business?

www.fastcompany.com/1650139/the-most-creative-people-on-twitter?partner=rss[68]

Learning Outcome 2.6:
Describe the three Business 2.0 tools for collaborating.

The three tools that harness the 'power of the people' for Business 2.0 include blogs, wikis and mashups. A blog, or web log, is an online journal that allows users to post their own comments, graphics and video. Blog websites let writers communicate—and reader's respond— on a regular basis through a simple yet customisable interface that does not require any programming. A wiki is a type of collaborative Web page that allows users to add, remove and change content, which can be easily organised and reorganised as required. While blogs have largely drawn on the creative and personal goals of individual authors, wikis are based on open collaboration with any and everybody. A mashup is a website or web application that uses content from more than one source to create a completely new product or service. A mashup allows users to mix map data, photos, video, news feeds, blog entries and so on to create content with a new purpose.

Classroom exercise 2.10 (LO 2.6)

Wikis, blogs and mashups as collaborative tools for business

Wikis, blogs and social media for Business: social media expert Suw Charman talks about the good the bad and the ugly of social media for business:

http://youtu.be/c4HVVdLeijo[69]

Professional fashion bloggers share their ideas on blogging, getting noticed and earning a living as a blogger:

http://youtu.be/39U-5HSy1TU[70]

Mashups can be fun music or video combinations or can be used to combine information for business scenarios. Here IBM creates a mashup for Boeing on disaster relief:

http://youtu.be/6xB0psBjpjI[71]

Serena provides an explanation of business mashups:

www.serena.com/docs/repository/mashups/serena-business-mashups-wp-era_of_collaborative-process-centric-applications.pdf[72]

Learning Outcome 2.7:
Describe Web 3.0 and the next generation of online business.

Web 3.0 is based on 'intelligent' web applications using natural language processing, machine-based learning and reasoning, and intelligent applications. Web 3.0 is the next step in the evolution of the internet and web applications. Business leaders who explore its opportunities will be the first to market with competitive advantages. Web 3.0 offers a way for people to describe information such that computers can start to understand the relationships among concepts and topics.

Classroom exercise 2.12 (LO 2.7)

Dynamic content

Dr James Canton talks about the future of business and the connected economy:

www.youtube.com/watch?v=Jbf4ekW7VcI&feature=share&list=UUxk_qTog2C-cPndFaMpem1w[73]

Classroom exercise 2.13 (LO 2.6)

Process of collaboration

Collaboration is always operating through certain group processes – processes of communication, coordination and cooperation, but also information sharing.

Divide students into four groups, each representing one of the processes above. Ask each group to make a list of the collaborative technologies differentiated by the collaboration processes they support.

These processes do not work independently of one another but are usually intermingled and determined by each other. True collaboration tools will try to provide help for all those collaboration processes, but their main focus is mostly on one of these areas.

Videos

Web 2.0/3.0

What is Web 2.0/3.0 for business? This video explains the differences for business:

http://youtu.be/l-JRhGwlBmU[74]

Entertaining video on Web 1.0, 2.0 and 3.0:

http://youtu.be/9ndQWJbbzos[75]

PowerPoint presentations

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CHAPTER 2
END OF CHAPTER SOLUTIONS

OPENING CASE STUDY
Paywalls and the business future of newspapers

1. **Do you think that 'citizen journalism' will eventually replace newspapers or merely supplement them?**

   There is no 'right' answer—students should express their opinions based on their own experience, their preferences or some consideration after searching the web.

2. **On the evidence to hand, do paywalls appear to be working?**

   The answer is both yes and no. After reading the case, students should be able to give the successful and not so successful strategies. Answers might also reflect their own opinions, a good thing!

3. **Will there still be print newspapers in five years' time? In ten years' time?**

   One answer—yes there will, but the form might be somewhat different. Not a week goes by without some comment by someone in the newspaper business somewhere in the world, so there is plenty of scope for students to have picked up on the general flow of opinion. Being generally in the younger demographic, they might be of the opinion that newspapers are useless, and they get all their news on their smart devices, phones or tablets.

4. **Will newspapers eventually have to get into the business of selling Kindle-type devices, such as electronic readers designed specifically for newspapers?**

   Again, one answer might be no—there is such a battle going on among tablet manufacturers that there might not be room for other players, like newspaper publishers. But then again, there might. There is plenty of room for debate.

CLOSING CASE STUDY 2.1
Ironman in Hawaii

1. **How is WTC using telecommunication and network technologies to improve its competitive advantage in the professional sports broadcasting industry?**

   WTC deployed a WiMAX wireless network across the course. WTC uses a variety of wireless technologies, namely RFID, wi-fi and WiMAX. The company used radio frequency identification (RFID) technology to track each athlete's progress, and used the WiMAX network's high bandwidth and geographic reach to transmit high-quality video and stream it over the internet in near real time. Home viewers and event spectators could view the video and monitor the athletes' progress by logging on to Ironmanlive.com. Wi-fi hotspots and an internet cafe provided convenience access. Staff used wireless technologies to plan and manage the event, enhancing their productivity and the athletes' wellbeing.

2. **Describe the different types of network architectures WTC is using.**

   WTC uses LAN, MAN and WAN architectures supported by wired and wireless technologies.

3. **Explain the role TCP/IP plays in the broadcast of the Ironman Triathlon World Championship.**

   TCP (Transmission Control Protocol) consists of a set of rules, the protocol, that are used with the internet protocol, the IP, to send data 'in a form of message units' between computers over the internet. Therefore, TCP/IP makes sure that the information being broadcast is sent and received from the devices (or people) that request it.

4. **Identify a new telecommunication or network product that WTC could use to improve its operations.**

   As time passes there will be many new innovations, which will in turn depend on when a student is using the text. Two possibilities that might spring to mind at the start of 2013 are GPS and miniaturisation.

   (a) There is no mention in the case of the use of GPS by the organisers. As such devices become more accurate and smaller they might well provide useful additional information to the competitors and their team management. As they use input from satellites for navigation, their information would be independent of the course WiFi network and video cameras.

   (b) All runners are expected to wear ankle bracelets with RFID tags. Perhaps this requirement to wear the bracelet on one ankle might be superseded by a miniature RFID tag embedded in clothing or implanted under the competitor's skin (to be removed after the event perhaps?!).

5. **What security issues does WTC need to address?**

   The main ethical and security dilemmas WTC faces are:

   - encryption of data sent via wireless devices
   - authorisation and authentication to use data services
   - privacy infringement with the use of RFID tags.

CLOSING CASE STUDY 2.2
Wireless bikes

1. **What advantages does a wireless network provide Denver B-cycle?**

   A wireless network can enhance mobility, provide immediate data access, increase location and monitoring capabilities, provide mobile commerce opportunities, improve work flow and provide an alternative to wiring. By implementing wireless network, the company is able to realise the benefits of new wireless technology without compromising their network security. By providing its customers with better access to information—real-time field reporting, database queries and bi-directional communication—customers can easily find any bike in the city. In addition to time savings, there will also be a significant improvement in the flow of information. With real-time communication across any available wireless network connection, requests can be filed immediately. The company can be more productive and accurate in their work, which in turn creates a more efficient and effective company.

2. **What challenges does a wireless network create for Denver B-cycle?**

   There are several challenges of wireless networks including protecting against theft, protecting wireless connections, preventing viruses on mobile devices and addressing privacy concerns with RFID and LBS. Any mobile device is vulnerable to loss no matter how big or small it is. The company may face significant exposure from stolen IDs, passwords, encryption keys and confidential information if the device falls into the wrong hands, especially if the theft is not discovered or reported immediately and the company does not have time to revoke access. Network intrusions can occur if access codes or passwords are stored on a device that is lost or stolen. However, any time a wireless network connects to a wired one, the wireless network can serve as a conduit for a hacker to gain entry into an otherwise secure wired network.

   The potential for contracting viruses on mobile devices is becoming a reality. The need for virus protection at the device level is critical. Any device that can access the internet or receive email is at risk of catching a virus and passing it on to other devices. As technology advances, the potential for privacy infringement does as well. RFID already has the capability to determine the distance of a tag from the reader location. LBS can track and monitor objects much like RFID. LBS risks the invasion of privacy and security caused by indiscreet location tracking. The main security risks the company should be aware of is someone intercepting their data transmissions. A few precautions the police department can take include:

   - encryption of data sent via wireless devices
   - authorisation and authentication to use data services
   - enable, use and routinely test the inherent security features, such as authentication and encryption methods that are available in wireless technologies
   - firewalls and other appropriate protection mechanisms should also be employed.

3. **What information not described in this case study can Denver B-cycle use with RFID and LBS data?**

   RFID could be used to tag all equipment and people who are renting bikes as well as tracking equipment.

   A WiMAX network could function as a backhaul connecting all of the fiber-ready towers to one another. It can also produce a wireless Cloud connectivity to the entire city using just a few

base stations. A WiMAX network could be deployed citywide and all communications applications run over it.

Using LBS applications with an integrated web and mobile-based solution will enable its employees and customers to quickly and easily access data right from their bike including maps, 'where am I' and directions.

4. **How could Denver B-cycle use other wired or wireless network technologies to gain a competitive advantage?**

   The wireless technology increases efficiencies and productivity with better, real-time access to information. The technology is designed to help companies provide better customer service by increasing their ability to securely access customer and equipment records, payment data and maps anywhere in the city. The possibilities for wireless technology are endless. As computers are combined with various forms of hand-held devices, it won't be long before wireless networks are as ubiquitous as refrigerators and dishwashers. In the long run, wireless networks will be cheaper since no structural changes will need to be made to the building's walls, ceilings or floors. If they want to add equipment, they simply add another node to the network. The company won't have to cut holes, run wires or alter the physical structure at all.

   Companies should use RFID to:

   - continuously track bike location
   - track the location of customers and employees throughout the city
   - track the location of expensive and critical repair equipment
   - restrict access to equipment.

CLOSING CASE STUDY 2.3
Pilot testing of the Explorer project

1. **Why did the development team pilot the Explorer project on the Sunshine Coast mainland rather than Fraser Island?**

   Trialling the Explorer project on the mainland rather than on Fraser Island reduced the cost of the pilot and facilitated participation of schools, teachers and students. Although school groups regularly attend the university's educational facility on Fraser Island, participation in the Explorer project trial would detract from the existing planned field work activities for these students. As a school-funded trip and with limited time on Fraser Island, teachers were reticent to allow students to participate in trials of new technology. Conversely, working with mainland schools means that the trial can fit into student free time or with existing school curriculum and lessons. Schools can report the trial as evidence of engagement with the ICT curriculum and next generation technologies. Student are able to work for longer periods with the development team to provide feedback on their experience with the device and assist the development team through iterative redesign and repeat visits. A mainland location reduced the cost and time demands for the development team to engage with the school and students resulting in more of the development team visiting the school and working with the student. A mainland school location was chosen for the trial with similar attributes to Fraser Island. The location is an environmentally sensitive and remote natural biosphere with similar flora, terrain and telecommunications coverage as Fraser Island.

2. **At what point in the development of the Explorer project should the team pilot the solution with the target user group? What can the development team learn through pilot testing, and how does this help improve the solution?**

   Testing a solution with your target users early in the development cycle can lead to solutions which better meet the user needs and reduce overall development costs. As the project progresses more money is expended on the development. It you test often, any misalignment between the user need and proposed solution can be rectified easily and cheaply. However, if the solution is only tested late in the project, there is the potential that more substantial change will be required rendering worthless existing costly development work. In the case of the Explorer project it was necessary for the device to be fully functioned and operational for students to be able to interactive with the device unaided and self-directed. However, as is often the case with technology development, the final artwork for the software was incomplete (e.g. icons, navigation style, fonts, skins etc.). The development team were able to test how well the students understood the device functions, were able to interact with the device and how they used the device to complete the required tasks.

3. **How can the development team formally assess the efficacy of the Explorer device for students' learning?**

   Few designs are rigorously evaluated, however it is important that the development team understand how well the solution meets user needs. The simplest evaluation strategy is to compare the performance, experience and/or usage of users with the new solution (experimental group) compared to users using a traditional solution and/or without a supporting solution (control group). In the case of the Explorer project, the development team compared the learning gains, experience and usage behaviour of students using the smartphone device against students completing the same task but using paper-based materials. The activities completed by students are the same for both smartphone and paper-based instructions. In the case of the smartphone group, all instructions are presented on the device and student record all data using the device. Those students using paper-based materials followed printed instructions and recorded data onto the paper as writing and sketches. Standardised instruments for learning, experience and usage were used with both the experimental and control groups.

4. **Why was one member of each participating student team asked to video record all interactions of their team with either the smartphone solution or paper-based materials? What could be learned from the video?**

   There are a number of benefits from participants recording the interaction of their colleagues with new technologies:

   - Participants are less inhibited in their behaviour compared to if a member of the development team was compiling notes or recording the video. Students trialling the Explorer device may alter their natural interactions with the device if a member of the development team were present. Although not present at the time, by watching the recorded video the development team can observe the student interaction with the device from within the group itself.
   - Participants often tell the development team what they believe the development team want to hear. By asking the team to video their interaction with the device the

development team get access to objective user experiences with the device rather than subjective accounts of experience.

- Trialling of GPS-triggered devices requires that users move about the environment. The Explorer trail involved multiple groups of users moving around a large natural environment. It would be difficult for the development team to track closely and concurrently the interaction of the groups with the device across multiple locations. Instead the students record as video their interactions during their movements around the environment.
- The teams tend to record what interest them and what is important to them. Students involved in the Explorer pilot videoed those aspects of the environment in which they were most interested and how and why they used the smartphone or paper-based materials to record information about these locations and items.

5. **Focus group discussions and the data collected by students and how it was used by students were analysed. How can this different data provide different understandings of how students use the Explorer device?**

   The data collected by students and the medium of collection (e.g. text, drawings, audio, photos, video) provides an insight into what interested students and how they wish to communicate this interest. The ability to use the smartphone to record more rich data (such as video) encouraged students to collect more information about more items and to consider how best to record the key attributes of items (e.g. course of water). Analysing data collected by students as part of the activities allows the team to understand how and when students engaged with the activities and the environment. Focus group discussions provide opportunities for the development team to understand the experience and emotional engagement of the students with the activities. Through focus groups, the team seeded the discussions around what aspects of the activities students liked the most (and why) and the least (and why). Additionally, students discussed in the focus groups what activities took longest to complete, were most difficult and which activities they would like to do more of and why. A combination of qualitative data in the form of focus group discussions and data collected by students, and quantitative data around learning gains and usage logging enables the team to iterative improve the solution to better meets the needs and abilities of the target user population.

CRITICAL BUSINESS THINKING

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. **ANYTHING BUT ONLINE**

   Project purpose: To understand the benefits of e-business

   Potential solution: Of course Susan can expand her business by taking it to the internet. And the best part is that putting her business online is essentially free, hence low risk. If she wants to grow her business she must expand by creating an online presence. Of course she will face numerous online security issues such as identify theft, false credit card information, and hackers and viruses. Many T-shirt businesses allow customers to submit their own T-shirt designs and choose the top one to be created into a T-shirt of the week. Susan could easily allow her customers to customise or personalise their T-shirts.

2. **THE FUTURE OF WIKIPEDIA**

   Project purpose: To understand the dangers of open source and open sharing

   Potential solution: Wikipedia's greatest ability is that it can be changed and updated quickly—it really is one of its best features. You can only update an encyclopedia every few years. As Jimmy Whales moves towards greater information reviews and accuracy, checking changing content should become an easier process. I don't think the majority of people realise that *anyone* can just go in and change Wikipedia. I think communicating this fact would be the first thing Wikipedia should do. Then, they should use technology to verify—for example, coloured backgrounds for verified by an expert versus a different colour if not verified. The trick is who decides on the expert and verifying Wikipedia might become a full-time job.

   In terms of the higher purpose of Wikipedia—to supply a free encyclopedia—it makes great sense. In many countries the thought of paying thousands of dollars for a set of encyclopedias is not an option. Wikipedia, although somewhat unreliable and untrustworthy, is a great alternative. I find much of the wiki information on MIS to be very accurate. Wikipedia is an attractive alternative if you have no other options for an encyclopedia.

   There are so many technological things that Wikipedia could do to help track changes and accuracy such as tracing revisions or allowing users to rank posts and their accuracy that allows users to vote how relevant or useful the information was—similar to Digg.com. This democratic method allows input from across the population to provide feedback on what pages are helpful and what are not. These can be very useful when using collaboration tools to help improve the efficiency and effectiveness of the tool. There are also additional collaboration tools that can help by keeping a history of revisions. This could allow your team to review the changes and who made each change—so you can gain insight into the history of the post. There are also ranking technologies that accompany each collaboration tool that allows users to vote how relevant or useful the information was—similar to Digg.com. This democratic method allows input from across the population to provide feedback on what pages are helpful and what are not. These can be very useful when using collaboration tools to help improve the efficiency and effectiveness of the tool.

3. **THE TOUGHEST UNI TEST TO TAKE**

   Project purpose: To understand technology dependency

   Potential solution: This is such a fun exercise to do in the classroom. Of course, this will vary depending on how technologically savvy your students are, but for the most part many of your students have cell phones and are on Facebook. I highly recommend performing this exercise in class. Then extrapolate the exercise to how a business needs to stay in contact 24/7. Just

imagine what can happen when the prime minister doesn't get a sales answer asap or a sales representative does not get an inventory count on the spot. People today want instant access to information and to other employees, which is both good and bad. No more vacations!

4. FIVE WAYS GOOGLE DRIVE SPEEDS UP COLLABORATION

Project purpose: Getting hands-on with open source software

Potential solution: Google Drive is open source software and its revenue model is simply to attract more individuals to the world's greatest search engine website. Create and share your work online with Google Drive. Upload your files from your desktop: it's easy to get started and it's free! Access anywhere: edit and view your docs from any computer or smart phone. Share your work: real-time collaboration means work gets done more quickly.

You can work with documents, spreadsheets, presentations, drawings and forms. There are so many great capabilities in Google Drive—just watch the video or review the functionality website.

www.youtube.com/docs[76]

www.google.com/google-d-s/whatsnew.html[77]

5. CITY COUNCIL MEMBER FIRED FOR PLAYING FARMVILLE GAME AT WORK

Project purpose: Understanding technologies negative impact on productivity

Potential solution: This is such an interesting discussion to share with your students. Student answers to this question will vary depending on their work experience and gaming history.

6. 48 HOUR MAGAZINE

Project purpose: Demonstrating the power of Web 2.0

Potential solution: This is such an interesting business model for a magazine that it is highly recommended to discuss it during your class. The lines between a weekly magazine, a 48-hour magazine, a daily newspaper and RSS feeds are blurring as we are bombarded with news 24/7. Why would someone choose *48 Hour Magazine* over a daily newspaper? Why would someone choose *48 Hour Magazine* over a weekly magazine? How will weekly magazines such as *Time* and *Newsweek* compete with *48 Hour Magazine*?

7. BUILDING NATIONWIDE BROADBAND

Project purpose: To understand the government's role in broadband

Potential solution: To kick start this activity, ask your students to view the following website:

National Broadband Network – Connecting Australia to a Better Future: www.nbn.gov.au[78]

8. SELECTING AN ISP

Project purpose: To begin to understand how vulnerable all computer networks are and the security features needed to protect them

Potential solution: There are a variety of answers here. Students should separate their responses according to software and hardware.

Software

- Virus protection software is crucial to network security. These software programs scan all data entering a network from any outside source for known viruses and warn of any viruses encountered to avoid corrupting network software. Updates for virus software are made available through the vendor, usually on a subscription basis.

Hardware

- Protection against unauthorised access from outside a network is usually provided through some sort of firewall service. Firewalls are either computers or routers that are set up to provide a secured ‘doorway‘ through which users can access the internet and internet users can access web data. Firewall services can be configured to meet specific security needs. They can be set up to screen internet users trying to access a network and to allow only certain authorised employees to access the internet from within a network.
- In addition, many firewalls now feature remote authorisation for employees using a remote (off-site) internet connection to access restricted network resources. Other non-internet applications for firewall services include protecting mainframes or subnetworks from general access within an organisation and ensuring confidentiality of data transmitted across networks.

APPLY YOUR KNOWLEDGE

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.

PROJECT ONE: WIKI YOUR WAY

A primary concern with collaboration tools (for students and in business) is getting people to share, contribute and post. Imagine how you would feel if you spent 10 hours working on a section of a group project and a team member came in and changed all of your material—for the worse. (Interestingly, the topic area that receives the most changes to its materials is Star Trek.) This is a big issue with collaboration software. You must be an avid lover of the topic to spend your time continuously changing and updating that material!

There is also additional collaboration tool functionality that can help businesses when communicating. Wiki software can typically keep a history of revisions. This could allow your team to review the changes and who made each change—so you can gain insight into the history of the post. There are also ranking technologies that accompany each collaboration tool that allows users to vote how relevant or useful the information was—similar to Digg.com. This democratic method allows input from across the population to provide feedback on what pages are helpful and what are not. These can be very useful when using collaboration tools to help improve the efficiency and effectiveness of the tool.

Also, businesses are creating corporate wikis where all common business terms are defined, especially for international organisations. For example, what Americans call a 'sale' may be called 'an order booked' in the United Kingdom, an 'order scheduled' in Germany and an 'order produced' in France. When users are in an application they can consult the corporate wiki if they have any questions on a business process or data definition.

PROJECT TWO: BLOGGING FOR DOLLARS

Student answers will vary depending on the blogs they choose to research and analyse. Prototypes will also vary depending on the company the student chooses to prototype. This site gives you the 15 most popular Blogs for 2012:

www.ebizmba.com/articles/blogs[79]

PROJECT THREE: THE 14TH ANNUAL WEBBY AWARD NOMINEES

Student answers to this question will vary depending on the Webby awards. Here is some interesting information to share with your students from the Webby Awards website.

Webby Judges Identify Top Challenges for the Internet

On the heels of the 20th anniversary of the World Wide Web last month, the International Academy of Digital Arts and Sciences (IADAS) has identified the top five challenges facing the medium in the next five years.

The Internet's Top Challenges In the Next 5 Years

Visit the site to see each of the top challenges explained in full:

http://www.webbyawards.com/press/next5

1. **Protecting privacy**
2. **Modernising Copyright Laws**
3. **Ensuring Net Neutrality**
4. **Maintaining the Open Web**
5. **Strengthening Internet Security**

PROJECT FOUR: STICKY WIKI

This is another great classroom exercise to provide your students with hands-on experience using real open source software.

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