Chapter 9 EMERGING TRENDS AND TECHNOLOGIES Business, People, and Technology Tomorrow

> Management Information Systems

for the Information Age >>>

_Stephen Haag / Maeve Cummings

© 2008 The McGraw-Hill Companies, Inc. All rights rese

McGraw-Hill

STUDENT LEARNING OUTCOMES

- 1. Describe emerging trends and technologies that will impact the changing Internet.
- 2. Describe emerging technologies for physiological interaction with technology.
- Describe emerging trends of Near Field Communication, Bluetooth, Wifi, cell phones, and RFID.
- 4. Define and describe emerging "pure" technologies that will impact the future.

CAN AN E-SOCIETY REPLACE OUR REAL SOCIETY?

- The question is not so far-fetched
- The average broadband user belongs to 4 online communities (e.g., Facebook, Myspace)
- Average U.S. child under the age of 12 spends only 45 minutes per week outdoors in unstructured activities (i.e., just playing)
- An exploding e-society is Second Life (http:// secondlife.com)

CAN AN E-SOCIETY REPLACE OUR REAL SOCIETY?

• At Second Life, you can...

- Buy land on which to build a home or business
- Connect with people with common interests
- Meet people in nightclubs
- Spend and make a lot of money, called Linden Dollars
- Buy Linden Dollars with real money
- Exchange Linden Dollars for real money

CAN AN E-SOCIETY REPLACE OUR REAL SOCIETY?

Class questions...

- How many social networking sites do you belong to? How much time do you spend weekly at those sites?
- 2. Beyond those sites, how much in total do you spend online per week? What do you do?
- 3. Are we becoming a society that is disassociated with the real environment? Is being online so much good or bad?

INTRODUCTION

• Technological changes will be unbelievable

Cummings

- You need to focus on how they will change your personal and business life
- Don't get caught up in only the technology itself

INTRODUCTION

I// Savanth Edition // 7/

for the Information Age

Systems

Management Information

Haag / Cummings



CHAPTER ORGANIZATION

- 1. The Changing Internet
 - Learning Outcome #1

ummings

- 2. Physiological Interaction
 - Learning Outcome #2
- 3. The Wireless Arena
 - Learning Outcome #3
- 4. Pure Technology
 - Learning Outcome #4

Cummings

THE CHANGING INTERNET

- Software-as-a-service (SaaS)
- Push, not pull, technologies and personalization
- F2b2C
- Voice over Internet Protocol (VoIP)
- Web 2.0

Software-as-a-Service

- Software-as-a-service (SaaS) delivery model for software in which you pay for software on a pay-peruse basis instead of buying the software outright
 - Use any device anywhere to do anything
 - Pay a small fee and store files on the Web
 - Access those files later with your "regular" computer
 - Makes use of an application service provider

Software-as-a-Service

- Application service provider (ASP) supplies software applications (and other services such as maintenance, file storage, etc) over the Internet that would otherwise reside on customers' computers
 - Now, mainly limited to business applications
 - Future, personal ASPs renting software to you

Software-as-a-Service

Software-as-a-Service



1/1 Sevanth Edition //

Push, Not Pull, Technologies and Personalization

- We live in a "pull" environment
- That is, you visit Web sites and request information, products, and services
- The future is a "push" environment
- Push technology environment in which businesses come to you with information, services, and product offerings based on your profile

Push, Not Pull, Technologies and Personalization

- This isn't spam or mass e-mail
- Businesses will know so much about you that they can tailor and customize offerings
- Consider a GPS cell phone and a movie rental store that monitors where you are
 - A system will determine if there any movies you like but haven't seen
 - The system will call you on your cell phone

Push, Not Pull, Technologies and Personalization



III. Sevanth Edition/// II for the Information Age Haag / Cummings

SE

Information

Management

F2b2C

New e-commerce business model

Cummings

• F2b2C, Factory-to-business-to-Consumer, a consumer communicates through a business on the Internet and directly provides product specifications to a factory that makes the customized and personalized product to the consumer's specifications and then ships it directly to the consumer

F2b2C

- - The business (small f) is only an intermediary between the consumer (capital C) and the factory (capital F)
 - A form of disintermediation
 - **Disintermediation** the use of the Internet as a delivery vehicle, whereby intermediate players in a distribution channel can be bypassed

Voice over Internet Protocol (VoIP)

- Voice over Internet Protocol (VoIP) allows you to send voice communications over the Internet and avoid the toll charges that you would normally receive from your long distance carrier
 - Catching on quickly in the business world
 - A little slower in the personal world
 - Not everyone has high-speed in-home Internet access

Web 2.0

Cummings

 Web 2.0 – 2nd generation of the Web with online collaboration, users as both creators and modifiers of content, dynamic and customized information feeds, and much more

- Wikis
- Social networking sites
- Blogs
- RSS feeds
- Podcasting

Web 2.0

 Wiki – allows you (as a visitor) to create, edit, change, and often eliminate content

- Enables crowdsourcing, when businesses provide enabling technologies that allow people (i.e., crowds)
 - instead of paid employees to create, modify, and oversee the development of products/services
- Social networking site sites like Myspace, Facebook, etc where you post information about yourself, find friends, and so on

Web 2.0

- **Blog** Web site in the form of a journal where you can post entries and people can provide comments
- RSS feed provides frequently published and updated digital content on the Web
- Podcasting ability to download audio and video files for viewing and listening to on portable devices and computers

PHYSIOLOGICAL INTERACTION

- Now, you use keyboards, mice, and the like
- These are physical interfaces
- Physiological interfaces will actually capture and use your real body characteristics
 - Voice
 - Iris scan
 - And the like

Automatic Speech Recognition

- Automatic speech recognition (ASR) not only captures spoken words but also distinguishes word groupings to form sentences
 - Becoming more a reality everyday
 - Commercial systems cost less than \$100

ASR 3 Step Process

Feature analysis – captures words and converts them into phonemes (syllables)

ummings

- **Pattern classification** matches phonemes to words in an acoustic model database
- *Language processing* makes sense of what you're saying by choosing the best words

Virtual Reality

- *Virtual reality* three-dimensional computer simulation in which you actively and physically participate
- Uses 3 unique devices
 - Glove

Cummings

anag

- Headset
- Walker

Virtual Reality Devices

- Glove input device; captures movement and strength of your hands and fingers
- Headset (head-mounted display) I/O device; captures your head movement; screen covers your field of vision
- Walker input device; captures movement of your feet as you walk or turn

Virtual Reality Applications

- Matsushita design your own virtual kitchen
- Volvo demonstrate car safety features
- Airlines train pilots for adverse weather conditions
- Motorola train assembly line workers
- Health care train doctors in surgery on virtual cadavers

Cave Automatic Virtual Environment

- Cave automatic virtual environment (CAVE) special 3-D virtual reality room that can display images of people and objects in other CAVEs
- These are holographic devices
- Holographic device creates, captures, and/or displays images in 3-D form

Cave Automatic Virtual Environment

th Edition///

genag

Ś



Cave Automatic Virtual Environment

- Visit friends and family without getting on an airplane
- Customer service the agent will appear next to you when you make a call
- The possibilities are limitless

Haptic Interfaces

- Haptic interface technology to add the sense of touch to an environment that previously only had visual and textual elements
 - Stationary jet ski arcade game in which the jet ski moves and rocks
 - Joysticks and game controllers that provide feedback in the form of vibration
 - Wii, which has revolutionized the home video game market

Biometrics

- Biometrics the use of physiological characteristics – fingerprint, iris, voice sound, and even breath – to provide identification
- That's the narrow definition
- Can also create custom-fitting clothes using biometrics

Custom Clothes with Biometrics



_Haag / Cummings







Biometric Security

Best security is 3-step

- 1. What you know (password)
- 2. What you have (card of some sort)
- 3. Who you are (biometric)
- Today's systems (ATMs for example) use only the first two
- One reason why identity theft is so high

Sprimm

Integrating Biometrics with Transaction Processing

- TPS captures events of a transaction
- Biometric processing system captures information about you, perhaps...
 - Weight loss
 - Pregnancy
 - Use of drugs
 - Alcohol level
 - Vitamin deficiencies

Cummings

Integrating Biometrics with Transaction Processing

Managemen



BUSINESS INTELLIGENCE

- Transaction processing information
- Biometric processing information

Integrating Biometrics with Transaction Processing

Is this ethical?

Cummings

- Can banks use ATMs and determine if you've been drinking?
- How will businesses of the future use biometric information?
 - Ethically?
 - Or otherwise?

Other Biometric Devices

- Biochip chip that can perform physiological functions when inserted into the human body
- Implant chip microchip implanted into the human body that stores information about you and can be used for tracking (GPS)
 - Family of 4 in Florida already have them
- *Facial recognition software* provides identification by evaluating facial characteristics

THE WIRELESS ARENA

- Provides tremendous mobility
- Will dramatically change everything
- Bluetooth short-range communication of about 30 feet
- WiFi longer-range communication of up to about several miles
- The next generation of cell phone technology
- RFID

Cummings

Cummings

Next Generation Cell Phones

- Hard disk (upwards of 2Gb now)
- Processor capability
- Music enhancements
- Video support
- Apple's iPhone

Next Generation Cell Phones

- Mobisodes short one-minute video clips of TV shows designed for viewing on a small cell phone screen
 - Download periodically
 - Combine to watch the entire show
 - Watch for them, these are coming soon (to a cell phone near you)

Next Generation Cell Phones

• There is a downside

- Cell phones = next great playground for hackers and virus attacks
- No good anti-virus software for cell phones right now
- Don't download ring tones from Web sites you could be downloading a virus

Cummings

RFID

 RFID (radio frequency identification) – uses a chip in a tag or label to store information, and information is transmitted from, or written to, the tag or label when the chip is exposed to the correct frequency of radio waves

mmings

 Wal-Mart is always in the business news about its requirement that all suppliers use RFID on products

RFID

- Common RFID is passive
- No battery power

Cummings

- Antenna absorbs radio waves and stores as energy
- When enough energy is stored, the chip is "jolted" to life and information transmissions occur

RFID

I// Sevanth Edition/// //

Systems

> Management Information

Haag / Cummings

for the Information Age



RFID Applications

- Exxon/Mobil Speedpass wave key ring at reader instead of swiping card
- Anti-theft car keys
- Library book tracking (the Vatican does it)
- Livestock tracking
- Supply chain most applications are here
- Passports coming to the U.S. in 2007

RFID Future

Each and every product with have an RFID (EPC)

- Uniquely identifies each product
 - Expiration date
 - Places traveled
 - Etc

Cummings

n B

PURE TECHNOLOGIES

- Many will have broad applications in numerous areas
 - Nanotechnology

mmings

- Multistate CPUs
- Holographic storage devices

Nanotechnology

- Nanotechnology discipline that seeks to control matter at the atomic and sub-atomic levels for the purpose of building devices on the same small scale
- Current approach start big and squeeze, press, slice, and dice to make things small
- Nanotechnology approach start with the smallest element possible (i.e., atom) and build up

Multi-State CPUs

Right now, CPUs are binary-state (0 and 1)

Cummings

- Multi-state CPU works with information represented in more than just 2 states, probably 10 states with each state representing a number from 0 through 9
- This will make small computers very fast

Holographic Storage Devices

- **Holographic storage device** stores information on a storage medium that is composed of 3-D crystallike objects with many sides or faces
- This will provide tremendous storage in a small space



MOST IMPORTANT CONSIDERATIONS

- The necessity of technology
- Closing the great digital divide
- Technology for the betterment of society
- Exchanging privacy for convenience
- Ethics, ethics, ethics

Cummings

/ Cummings

for the Information Age : /// Sevanth Edition/

The Necessity of Technology

- It's everywhere
- It's inescapable
- It's up to you how it gets used

Closing the Great Digital Divide

- There are technology-challenged countries and cultures
- You must take technology to those places

mmings

Technology for the Betterment of Society

Businesses use IT to make money and that's okay

Cummings

- Technology can also be used when no money is to be made; and that's great
- Many medical applications of IT will never make any money

Cummings

the Information Age /// Sevanth Edition

Exchanging Privacy for Convenience

- You do this everyday in small ways
- Be careful
- Don't give up too much privacy

Ethics, Ethics, Ethics

Ethics are essential

Cummings

- Our society cannot operate without them
- Use technology wisely
 - For financial gain
 - But never to the detriment of other people