

E-Commerce: Challenges and Issues

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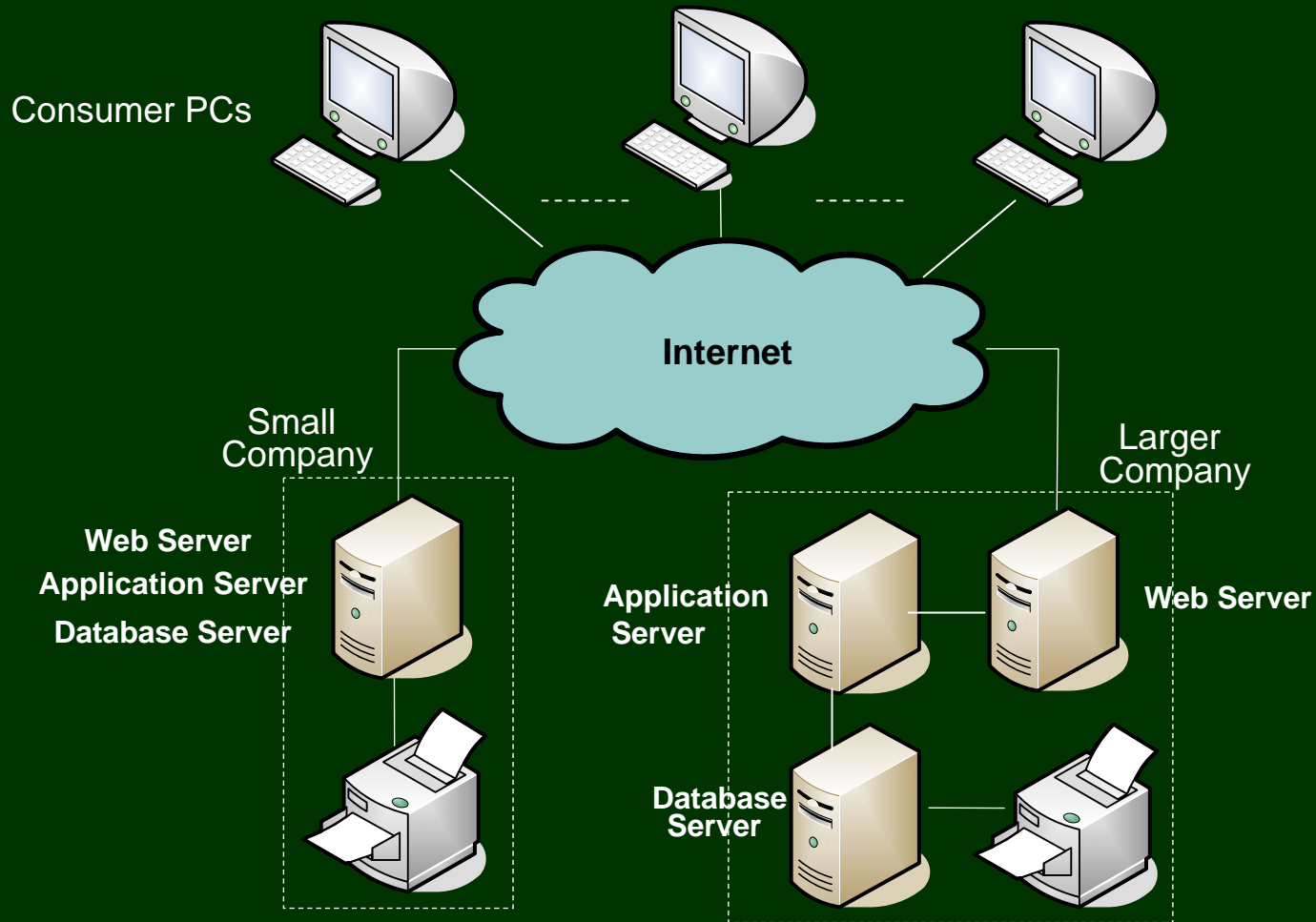
Agenda

- E-Commerce: What is it?
- E-Commerce: Business Models
- Why is E-Commerce important?
- Challenges and Issues
- Conclusions

E-Commerce: What is it?

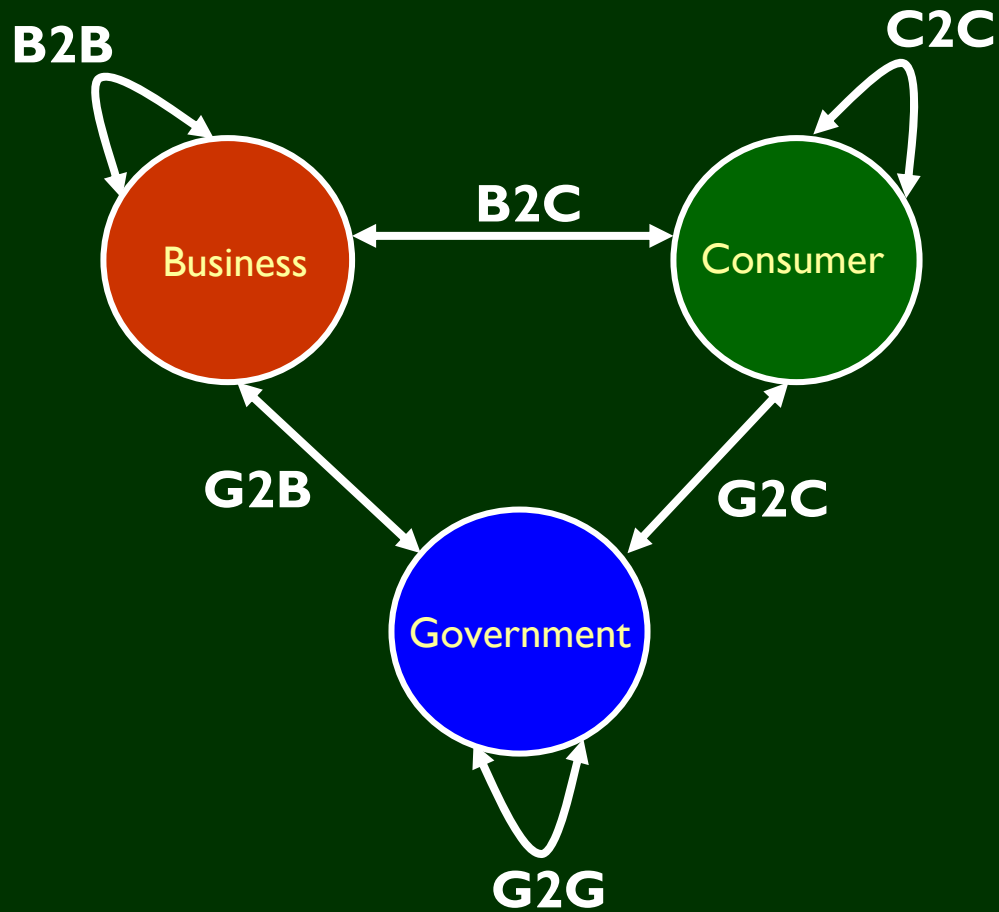
- Wiegand (1997): “Any form of economic activity conducted via electronic connections”
- Does not have to involve the Internet and WWW
- Three main components to e-commerce:
 - Economic activity involved
 - Interaction occurs electronically
 - The interaction crosses organizational boundaries
- What about “e-business”?
 - e-commerce definition plus within firm operations

An E-Commerce System Architecture Example



Examples of 2-tier and n -tier implementations

E-Commerce: Business Models



Why is E-Commerce important?

- Lowers transaction costs
- Estimates of future use in the trillions of dollars of activity

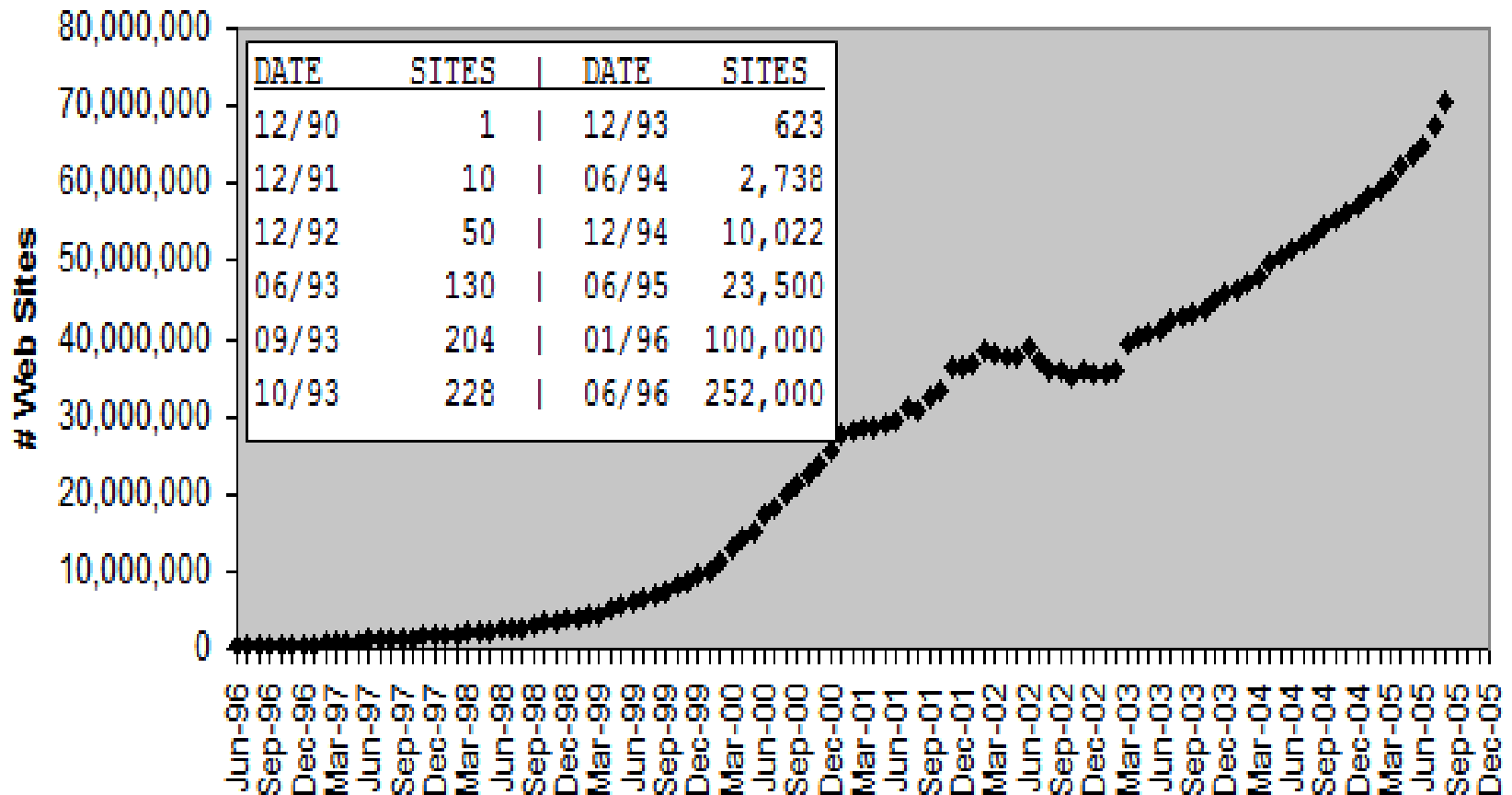
Industry	Total Market	Internet Share	Internet Share in 2003	% increase
Retail	\$2.6 trillion	\$16.8 billion	\$62 billion	269
Manufacturing	\$4.2 trillion	\$134 billion	\$1.7 trillion	1169
Finance	\$1.9 trillion	\$103 billion	\$435 billion	322

Source: C. Byron, "Net Dry Rot," Business 2.0 (April 2000): 195-210

Challenges: Exponential growth of internet networks and connections

Hobbes' Internet Timeline Copyright ©2005 Robert H Zakon

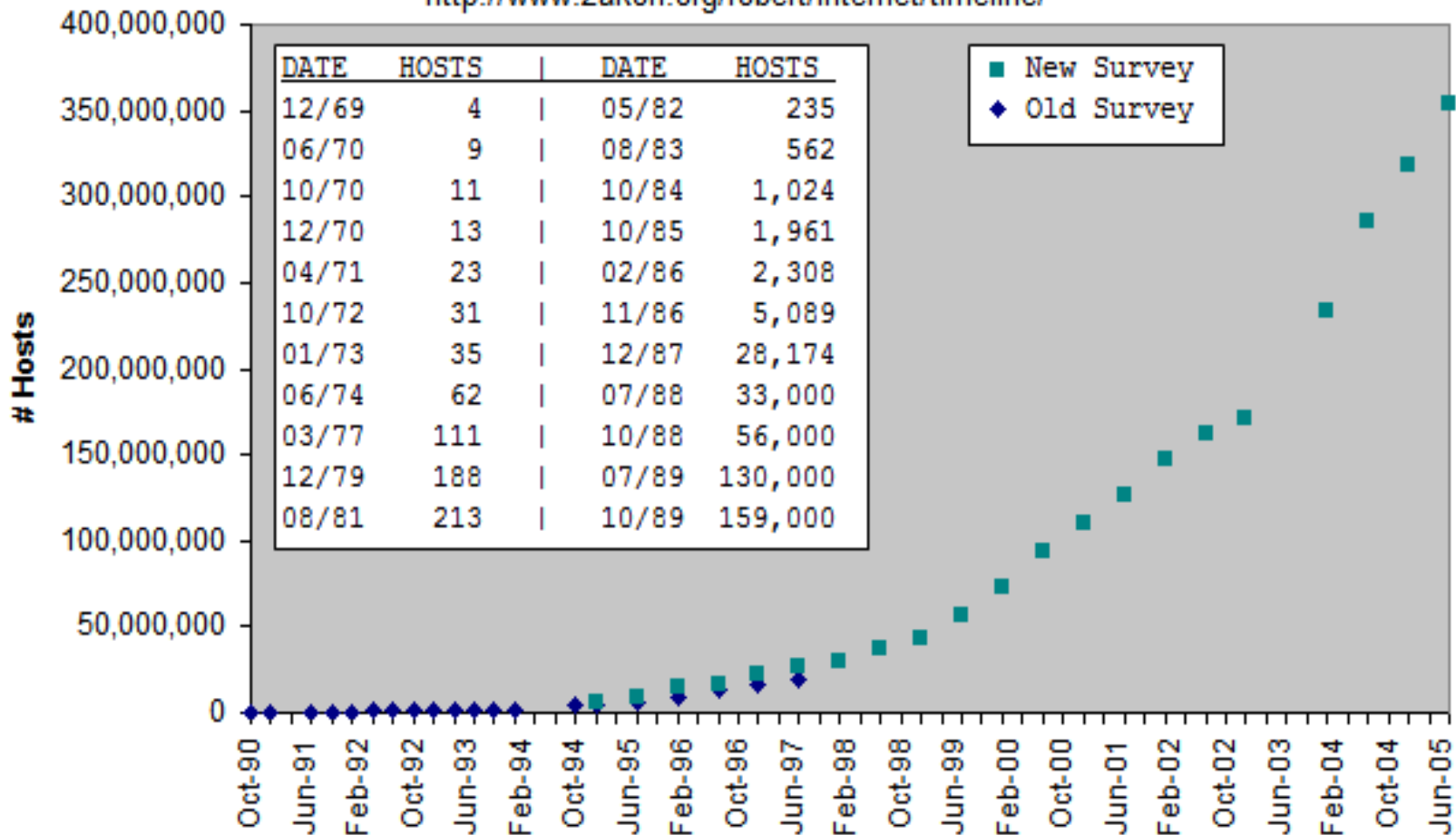
<http://www.zakon.org/robert/internet/timeline/>



Challenges: Exponential growth of internet networks and connections

Hobbes' Internet Timeline Copyright ©2005 Robert H Zakon

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The Dot-coms Crashes: Lessons Learned

Top 5 dot-com flops*

1. Webvan (1999-2001): online grocery
2. Pets.com (1998-2000): online pet-supply store
3. Kozmo.com (1998-2001): online store and delivery service
4. Flooz.com (1998-2001): online currency
5. eToys.com (1997-2001):

* Source: Top 10 dot-com flops, cnet.com

E-Commerce Challenges and Issues

- Technical issues
- Perceptual issues
- Societal issues
- Legal and ethical issues
- Intellectual property issues

Technical Issues

- Interoperability
- Security
- Privacy
- Connectivity to existing systems (backward compatibility)
 - Web-based front-end systems must be able to connect with back-end legacy systems that tend to be large, complex, and poorly documented.
 - Must use “middleware” to **translate data from one system to another.**
- Internet “pipeline” capacity to support efficient transmission of possibly large-sized contents (music, videos, high-resolution graphics/photos)
 - E.g., Napster phenomenon
- Web organization – how to conveniently locate products or services on-line from a dozen of “directories” on the Web.

Technical Issues: Interoperability

- The ability of systems running in different operating environments to communicate and work together.
 - E.g., clients running Windows XP can access Web pages from servers running Linux.
- For the interoperability to work, the same set of rules (protocols) must be followed.

Technical Issues: Interoperability

- Internetworking standard, i.e., TCP/IP
 - TCP: managing overall network transport function
 - Breaking information into data packets, tagging each packet with a sequence number before submitting it to the IP layer.
 - At the other end, TCP layer assembles all packets received and rearrange them in original order.
 - IP: managing addressing and routing
 - Addressing – determining the addresses to be used
 - Routing – determining the best possible route for packet transmission

Technical Issues: Security

- Threats to systems
- Three types of security threats
 - denial of service,
 - unauthorized access, and
 - theft and fraud

Technical Issues: Security (DOS)

- Denial of Service (DOS)
- Two primary types of DOS attacks: spamming and viruses
- Spamming
 - Sending unsolicited commercial emails to individuals
 - E-mail bombing caused by a hacker targeting one computer or network, and sending thousands of email messages to it.
 - Smurfing involves hackers placing software agents onto a third-party system and setting it off to send requests to an intended target.
 - DDOS (distributed denial of service attacks) involves hackers placing software agents onto a number of third-party systems and setting them off to simultaneously send requests to an intended target

Technical Issues: Security

- Viruses: self-replicating computer programs designed to perform unwanted events
- Worms: special viruses that spread using direct Internet connections
- Trojan Horses: disguised as legitimate software and trick users into running the program

Technical Issues: Security (unauthorized access)

- Illegal access to systems, applications or data
- Passive unauthorized access – listening to communications channel for finding secrets.
 - May use content for damaging purposes
- Active unauthorized access
 - Modifying system or data
 - Message stream modification
 - Changes intent of messages, e.g., to abort or delay a negotiation on a contract

Technical Issues: Security (unauthorized access)

- Masquerading or spoofing – sending a message that appears to be from someone else.
 - Impersonating another user at the “name” (changing the “From” field) or IP levels (changing the source and/or destination IP address of packets in the network)
- Sniffers – software that illegally access data traversing across the network.
- Software and operating systems’ security holes

Technical Issues: Security (theft and fraud)

- Data theft already discussed under the unauthorized access section
- Fraud occurs when the stolen data is used or modified
- Theft of software via illegal copying from company's servers
- Theft of hardware, specifically laptops

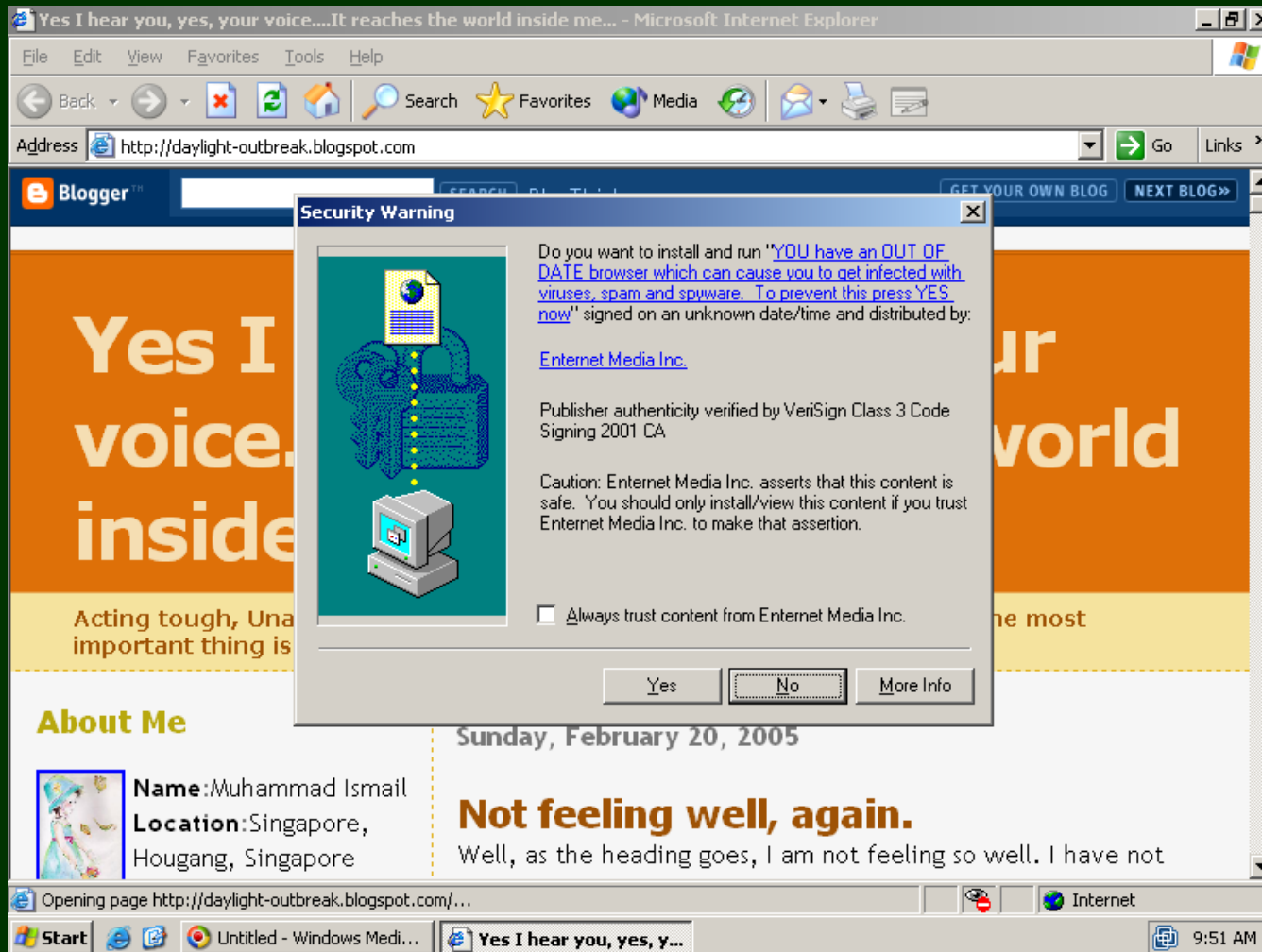
Technical Issues: Privacy

- Threats to data
- Data collection
 - Faster and easier data collection thru online technology
 - Cross-referencing (aggregation) real offline consumer data with online purchasing habits collected with or without their knowledge. Or cross-referencing online data with other online data between several Web entrepreneurs, for example
 - Hidden data collection without consumer consent, possibly thru cookies, for example
- Usage tracking
 - Patterns of online activity lead to inferences about the user's product preferences for providing customized pop-up ads and referring sites.
 - May include today's spyware.

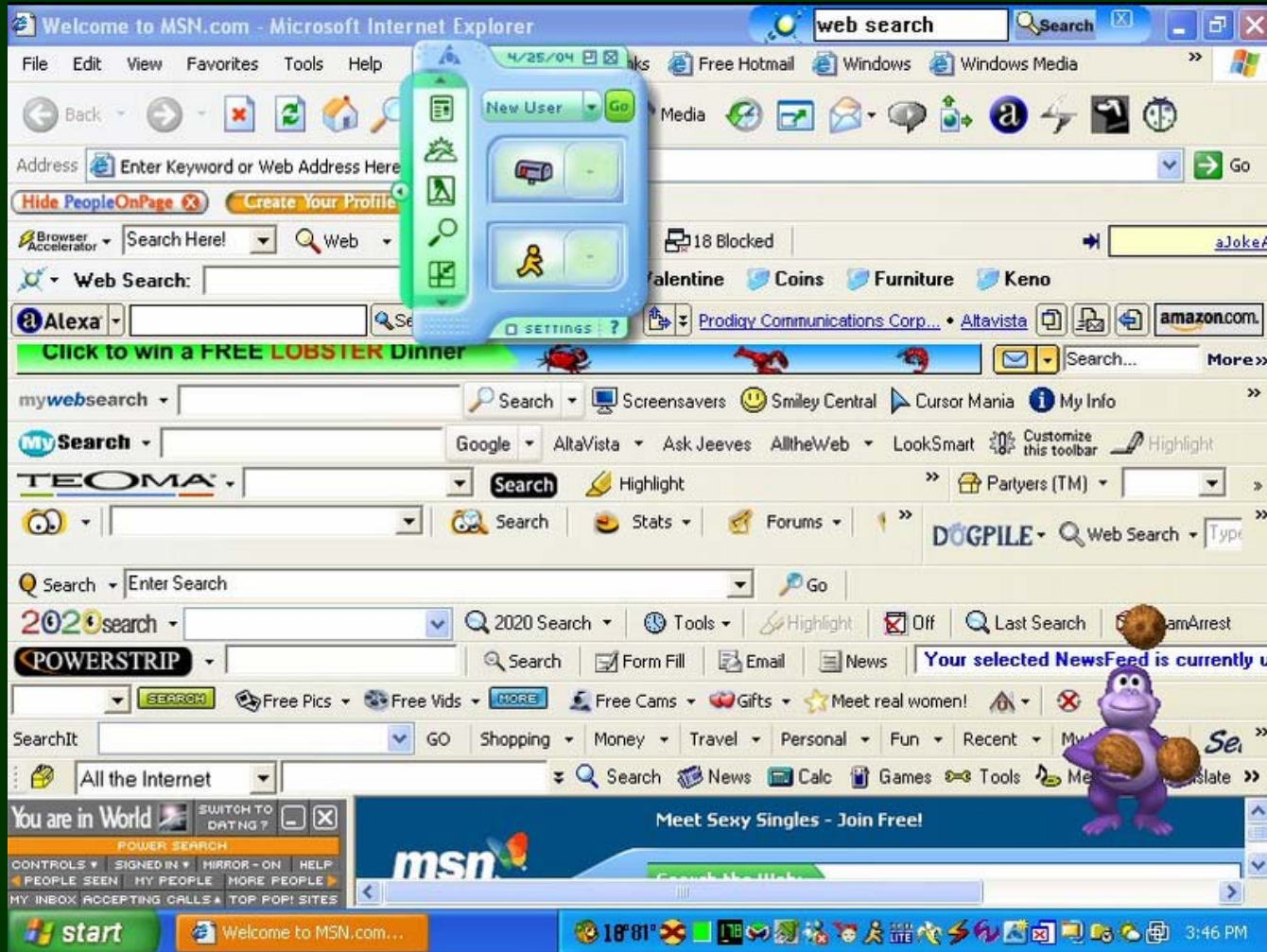
Technical Issues: Privacy

- Spyware: a type of program that watches what users do with their computer and then sends that information over the Internet to the spyware's author

Technical Issues: Privacy (A Spyware Example)



Technical Issues: Privacy (Another Spyware Example)



Technical Issues: Privacy (Phishing Techniques)

- Misspelled URLs or the use of subdomains, e.g.,
`http://www.yourbank.com.example.com`
- Spoofing links using Web addresses containing the @ symbol, e.g.,
`http://www.google.com@members.tripod.com`



`//<user>:<password>@<host>:<port>/<url-path>`

- Use of JavaScript commands to alter the address bar by placing a picture of the legitimate URL over the fake one, or by closing the fake URL and opening a new one containing the legitimate URL

Technical Issues: Privacy (Phishing: An Example)



Dear valued customer of TrustedBank,

We have recieved notice that you have recently attempted to withdraw the following amount from your checking account while in another country: \$135.25.

If this information is not correct, someone unknown may have access to your account. As a safety measure, please visit our website via the link below to verify your personal information:

<http://www.trustedbank.com/general/custverifyinfo.asp>

Once you have done this, our fraud department will work to resolve this discrepancy. We are happy you have chosen us to do business with.

Thank you,
TrustedBank

Member FDIC © 2005 TrustedBank, Inc.

Technical Issues: Privacy (Phishing: Another Example)

From: service@paypal.com
Subject: Your PayPal Account

PayPal The way to send and receive money online

Security Center Advisory!

We recently noticed one or more attempts to log in to your PayPal account from a foreign IP address and we have reasons to believe that your account was hijacked by a third party without your authorization. If you recently accessed your account while traveling, the unusual log in attempts may have been initiated by you.

If you are the rightful holder of the account you must **click the link below** and then complete all steps from the following page as we try to verify your identity.

[Click here to verify your account](#)

Actual link URL: [http://80.179.238.73/ ... paypal/](http://80.179.238.73/...paypal/)

If you choose to ignore our request, you leave us no choice but to temporarily suspend your account.

Thank you for using PayPal! The PayPal Team

Please do not reply to this e-mail. Mail sent to this address cannot be answered. For assistance, [log in](#) to your PayPal account and choose the "Help" link in the footer of any page.

To receive email notifications in plain text instead of HTML, update your preferences [here](#).

PayPal Email ID PP697

Protect Your Account Info

Make sure you never provide your password to fraudulent persons.

PayPal automatically encrypts your confidential information using the Secure Sockets Layer protocol (SSL) with an encryption key length of 128-bits (the highest level commercially available).

PayPal will never ask you to enter your password in an email.

For more information on protecting yourself from fraud, please review our Security Tips at <http://www.paypal.com/securitytips>

Protect Your Password

You should never give your PayPal password to anyone, including PayPal employees.

Technical Issues: Privacy (Phishing: One More Example)

The screenshot shows a browser window with the address bar containing a URL that appears to be a legitimate Yahoo! Photos link but is actually a phishing site. The page layout mimics the real Yahoo! Photos interface, including a sign-in form, promotional banners, and a search bar. The sign-in form asks for a Yahoo! ID and password, with a 'Remember my ID on this computer' checkbox and a 'Sign In' button. Below the form, there are links for 'Why this is secure', 'Forgot your ID or password?', and 'Sign-in help'. To the right of the sign-in form, there are three boxes: 'Don't have a Yahoo! ID? Signing up is easy. Sign Up', 'One Yahoo! ID. So much fun!', and a search bar. The page footer contains copyright information and a privacy policy link.

Yahoo! Photos - organize, share, and print your digital photos online - Mozilla Firefox

File Edit View go Bookmarks Tools Help

http://www.geocities.com/lots_of_laifs.com36/

Latest Headlines News tp Photography Email Travel

YAHOO! PHOTOS Yahoo! - Help

Wow... Talk about a photo opportunity
Jump in and enjoy the Web's largest photo sharing service.

How many photos did you say you have?
Yikes! No problem though, we offer FREE unlimited storage.

Get 'em in as little as an hour
Order professional quality prints for pick-up at your neighborhood Target store.

Play nice - learn how to share
Share photos through email, in real time using Yahoo! Messenger with Voice, or even from your mobile phone with Yahoo! Mobile.

To access Yahoo! Photos...
Sign in to Yahoo!

Yahoo! ID:
Password:

Remember my ID on this computer

Sign In

Why this is secure
Forgot your ID or password? [Sign-in help](#)

Don't have a Yahoo! ID?
Signing up is easy. [Sign Up](#)

One Yahoo! ID. So much fun!
Use it to check mail, listen to music, share photos, play games, instant message, and so much more.

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[E-commerce Solutions from Yahoo!](#)
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[Yahoo! Web Hosting \\$25 Setup Waived](#)
Reliable plans include free domain & 24-7 support. [webhosting.yahoo.com](#)

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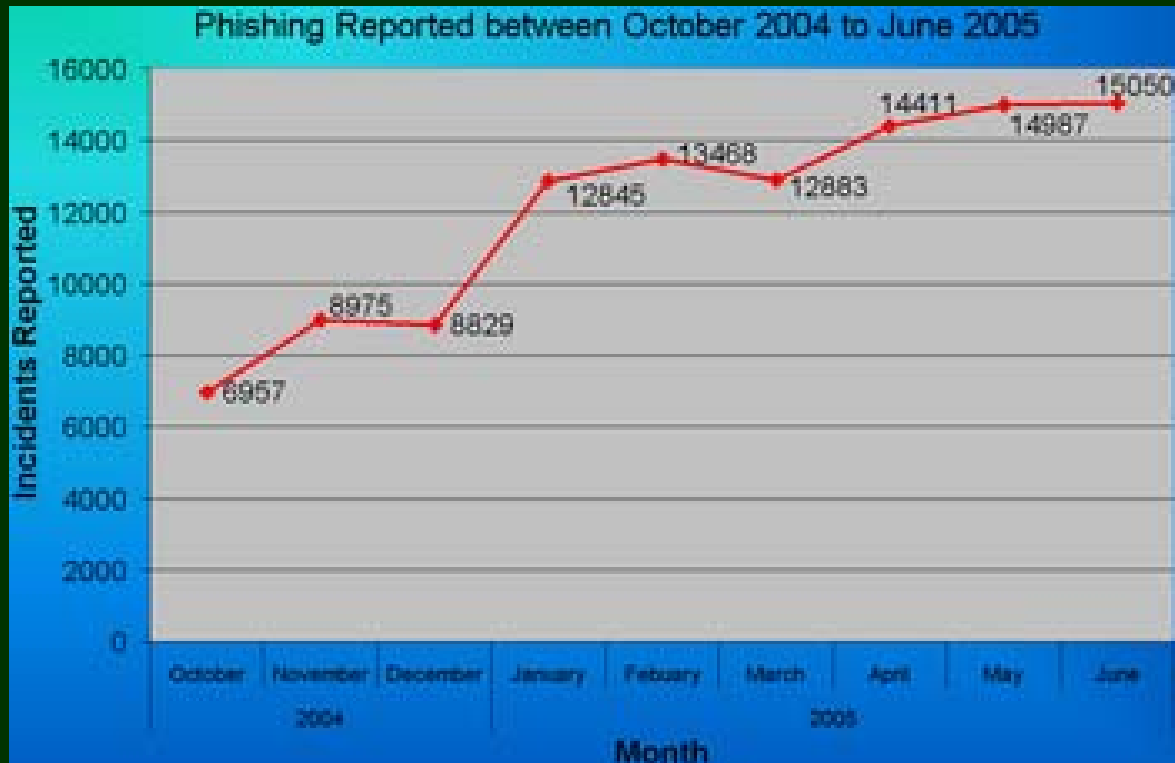
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Done

Technical Issues: Privacy (Phishing: Statistical Data)



Perceptual Issue: Trust

- One of the most important barriers to the use of e-business.
- Hosmer (1995): “the expectation that the other party will behave in accordance with commitments, negotiate honestly, and not take advantage, even when the opportunity arises.”
- Trust lies somewhere between total trust or complete lack of trust.
- Level of trust may change over time as one becomes more familiar with the other party through experience or other knowledge.
- Characteristics of e-business transactions that make trust important
 - Distance
 - Technology – e.g., buyers must trust a merchant to be knowledgeable enough to make use of IT to implement some security measure to protect their credit card numbers.

Perceptual Issue: Components of Trust

- Predictability
 - Establishing clear expectations – e.g., consistently sending email notifications of order confirmation, and of order shipment.
- Reliability
 - Providing follow through (do according to what merchants' promise)
- Technical competence
 - Ability to carry out responsibilities (and show this clearly to potential users)
- Fiduciary responsibility
 - Act on behalf of the customer's interests (e.g., on-line travel agencies)

Societal issues

- Telecommunications Infrastructure
 - Differences in cost of connecting and (cost/income)
- Access Inequalities
 - Digital Divide and access to equipment
- Information Technology Skills Shortage
 - Workforce shortage (large number of unfilled IT positions)
 - Global movement of IT workers (“brain drain”) from developing countries to developed ones for higher salaries
 - Retaining IT workers in the field (jobs rotations, providing training)

Legal and Ethical Issues

- Digital signatures
 - Knowing whose messages come from
 - Used for 2 purposes
 - Authenticate identity of signer
 - Nonrepudiation
- Consumer Protections!
 - Small-claims courts
 - Limited liability
 - Return policies

Intellectual Property Issues

- Protection
 - Copyrights – software, arts (literature, artwork, music)
 - Patents – inventions
 - Trademarks – name brands and logos
- Global uniformity of laws – different countries may enforce software copyright laws differently
- “Link liability” – linking to other sites that publish materials belonging to other people without permission
- Domain names (who owns “lakers.com”?)
 - The basketball team or some individual
- Patenting business processes
 - Amazon’s “1-Click” VS Barnes & Noble’s “Express Lane”
 - Priceline’s name-your-price VS Expedia’s price matching system

Conclusions

- To achieve projected goal of Internet exercise of e-commerce activities, several tasks must be accomplished
 - Telecom and basic infrastructure must be widespread throughout the country and affordable
 - Relevant laws must be in place and strictly enforced
 - Independent organizations must be established to protect consumer's right
 - People must be educated enough to understand how to use the Internet to its fullest capacity
 - IT personnel must be built

Thank you

- These slides can be downloaded from

<http://www.cpe.ku.ac.th/~ms>

Questions

