7. IT and society

1. The information society
2. Privacy and security
3. Freedom of expression
4. Intellectual property
5. Work, education, and the future

Inquiry

• How will changes in IT affect all of us, in our personal and work lives?
• What new issues of debate does IT create?
• Do you have privacy concerns about IT?
Why study this?

*We seek*
- a basis for understanding privacy and security policies
- to know our rights
- to be effective citizens
- to be effective professionals

Topic objective

Explain how the IT revolution has developed and how it raises new ethical and legal issues in several fields
Essential and priority objectives

7.0a Recall basic design concepts*  
7.0b Recall programming concepts  
7.1b Describe technical changes that raise social issues**  
7.2 Explain new issues in privacy and security*

1. The information society

- Have you heard of ‘globalization’?
- Has the society changed as a result of developments in computer technology?
- Has your life changed as a member of society?
- Do these changes deserve a new name for the kind of society we live in?
Subtopic objectives

7.1a Explain economic and social factors in the IT revolution

7.1b Describe changes in IT that raise legal or ethical issues**

Mutual influences

IT makes possible more social centralization and decentralization; new mathematical ideas enabled creation of IT

Our ideas are shaped by our social experience and our experience with IT; new ways of thinking have social consequences

Business needs and industrial-scientific advances created IT; IT changes social relationships and raises new ethical and legal problems
Globalization

- Globalization emerged from the convergence of computer and communications technology in response to a profit squeeze in the 1970s
- *Key new element:* In a self-feeding spiral, progress in management, knowledge, and technology is applied to these same three things

Global economy

- *Definition:* “an economy with the capability to work as a unit in real time ... on a planetary scale”
- Not the same as world economy, which has existed since 16th century
- Core of most national economies is global
- Examples of global aspects: financial markets, international trade, transnational production
The network economy

- Thesis by M. Castells: The global informational economy is associated with “a new organizational logic” that converges and interacts with new technological paradigm
- Mass production is converted to flexible production
- Crisis, not of the large corporation, but of its traditional form of hierarchical, vertical integration and functional management

Special characteristics of network communication

- Scope (speed/immediacy; vastness of reach; interactivity)
- Anonymity (implying diminished trust)
- Reproducibility (enables violation of privacy and copyright)
Kinds of policy choice

• **Personal**: Choices depend on values and situation
• **Organizational or business**: Choices depend on consumer demand, market behavior, ethics, laws
• **Law**: Decisions impose constraints on people who didn’t make them
• **A moral framework for legal discourse**
  – Based on notion of human rights
  – Freedom and autonomy of the individual must be recognized
  – Individuals have responsibility toward society

Rights, goals, and laws

• **Negative rights** (liberties) imply that no one may prevent a person from acting
• **Claim rights** (positive rights) imply an obligation by others to provide something
• **Laws** may enforce ethical principles (e.g., against stealing) or may establish *conventions* (e.g., driving on the right)
• **Goals** (e.g., profit maximization) may be ethical, but ethical constraints may also apply to *actions* pursuing these goals
New ethical challenges

- Scope of interaction is worldwide
- Environment is interactive
- IT enables anonymity
- IT enables
  - universal connectedness
  - new ways to reproduce information
  - cheap copying, storage, communication
  - malleability of information

Does this hypothesis hold?

The networked character of computing today accelerates the rate of change in computing and in society.

(M. Castells, The Network Society)
2. Privacy and security

• Do you have privacy today?
• Are you concerned about privacy?
• Is privacy about power?
• Do privacy safeguards protect the power of individuals?
• Do IT-enabled security and privacy intrusions assert power over individuals?

Subtopic objective

7.2 Explain new issues in privacy and security*
Privacy

- **Definition:** a person's control of revelation of personal information about self, attitude, behavior
- A human right (UN)
- Business information - whose?
- Role of technology in enabling erosion of privacy
- Email at work: not private

Privacy standards

- Fair Information Practices principles (OECD, 1980)
  - Limited collection
  - Quality
  - Purpose
  - Use limitation
  - Security
  - Openness
  - Participation (access)
  - Accountability
Why IT raises privacy issues

• Ease of collecting data
• Ease of copying
• Ease of communication
• Power of processing data
• Storage capacity

Third-party cookie loophole

• You visit site B and see there an ad at site A, which leaves a cookie on your computer when you visit
• Same when you visit site C.
• So A can know about your visits to B and C.
Search and seizure of electronic data

- Search requires warrant with specifics
- Seizure of evidence not related to warrant is allowed only if “in plain view”
- What is “plain view” on a laptop?
- Automated search is a grey area

Effect of data collection on privacy

- Online data is collected and linked by computers
- User is often uninformed of collection
- “Secure” data may be leaked
- Re-identification of “anonymous” data is possible, e.g., queries about one’s car make, college, etc.
- Data online is copied and re-published even if removed
- Data provided for one purpose is often used for other purposes
Security and encryption

- *Secure connections* are those that encrypt the data communicated; protocol is *https*
- *Encryption* transforms a message into a difficult-to-read text; decryption transforms encrypted text to readable form
- Encryption/decryption use algorithms and a private key; sometimes also a public key
- *Strong encryption* is hard to “break”
- Public keys enable client browsers to encrypt messages for sending securely to recipients

Case: corporate data collection

- *Big data* is the massive collection of transaction and demographic data about customers and others
- The *customers* of Facebook, Google, and Twitter are not the *users*; they are the organizations that pay for data about the users collected online
National-security privacy issues

- In June 2013, a contractor revealed that the National Security Agency collects data on every phone call made on certain carriers such as Verizon.
- A secret court grants permission for the NSA to order carriers to provide this data.
- What safeguards are needed for the handling of personal data?
- Is security in conflict with privacy?

Back-door access for government

- Regulations in 1990s required export of products only with weak encryption, e.g., phones.
- Enforcement of weak encryption enabled intelligence agencies and FBI to intercept communications.
- Research has found that weak keys enable non-governmental hacking of devices and sites as well.
- 2015: Weak encryption keys are still used in some devices and websites; 36% of online servers are vulnerable.
3. Freedom of expression

- What is freedom of expression, for you?
- What are *human* rights?
- Do computer systems widen freedom of expression, or limit and constrain it?
- What expression is not protected?

Subtopic objective

7.3 Explain new issues in freedom of expression
Human rights

• The Universal Declaration of Human Rights was adopted in December 1948 by U.N. General Assembly

• Excerpts:
  – “All human beings are born free and equal in dignity and rights.”
  – “Everyone has the right to freedom of opinion and expression … through any media and regardless of frontiers.”

The First Amendment

• U.S. Constitution: “Congress shall make no law … abridging the freedom of speech, or of the press…”

• Protection is precisely for speech that may offend

• Covers many forms of expression

• Encodes a negative right (liberty); does not ensure that a writer gets a publisher
Corporations and First Amendment

• 2010 Supreme Court decision extended free-speech coverage to corporations

• *Question:* are corporations persons in the sense intended by the First Amendment?

• *Citizens United* case was about funding of a documentary/advocacy video to affect an election campaign

• Advocacy groups such as PACs may collect anonymous donations

Workplace freedom of expression

• The first Amendment protects against *government* restrictions on freedom of speech

• It does *not* cover relations between employers and workers or contractors

• *Examples:* Workers have been fired for working for candidates, *outside work time*

• This tells us that privacy may also be a free-expression issue
**Freedom-of-expression issues**

- Changes in IT raise dilemmas due to
  - Widespread access to sending or receiving
  - Easy copying
  - Faster communication
  - Anonymity
- Questions:
  - Is Internet more like TV broadcasting or like print publishing?
  - Is a link equivalent to publishing?
  - Is a chat room a public place?

**Incitement, threats, and cyberbullying**

- Inciting, threatening harm, or planning crimes are not protected forms of expression
- *Cyberbullying* is a widely recognized problem that includes harassment with or without threats and defamation
- Cyberbullying is a special concern because young persons have been harmed by it and some have harmed themselves
Defamation

- Elements of a claim:
  - False and defamatory statement exposing someone to contempt or ridicule
  - Published to one or more third parties
  - Negligence or worse by publisher
  - Result is presumed or actual damage

- Distributors of information are not liable as publishers are

Dilemmas about free speech online

- Is an ISP, or another intermediary, a publisher?
- Is anonymous speech threatened?
- Can you be sued in many countries for your posting?

- Example: Is French ban on Nazi paraphernalia applicable to Yahoo (US)?
Global information infrastructure

• *GII*: Computer and telecommunications technology, together with resources that support the Internet
• Telcom lines *can* connect everyone in the world to everyone else; do they?
• The GII’s *values* may be said to include symbolizing the future
• Do these values include expanded democratic freedom?

4. Intellectual property

• What kind of file sharing is OK?
• Is software the property of the buyer?
• How does the law protect intellectual-property rights?
• Are current law and law enforcement appropriate?
Subtopic objective

7.4 Explain intellectual-property issues

Copyrights and patents

- *Intellectual property*: Owner’s monopoly control of distribution of *expressions* of ideas
- *Copyright law* protects ownership of text, music, and other forms of expression
- *Patents* protect *ideas* and *processes*
- Software vendors own and *license* their code
- *Copyright* protection has expanded, but Supreme Court has invalidated existing *patents* for some human genes
Intellectual property and the Internet

- Before printing, intellectual property was not an issue because it was almost as hard to copy a book as to write one
- Copying is easier
- Medium is decreasing part of cost
- Production costs may be recovered by access control, technical assistance, advertising

Electronic publishing and intellectual property

- Electronic publishing reduces costs and risk of publication
- “Access to an overwhelming number of elements of daily life is now controlled by intellectual property law.” (S. Warwick)
- “Copyright in the United States is becoming more a tool for securing property interests than a mode of encouraging new works.” (Warwick)
**Plagiarism**

- Plagiarism violates academic integrity and intellectual property but is not often a court matter
- In the August, 2010, article, “Plagiarism lines blur for students in digital age,” the author describes “a disconnect that is growing” between students and professors about plagiarism.
- Do you agree or disagree?

**Purpose of intellectual property**

- Public benefits (not a “natural” right)
- To encourage innovation by rewarding it
- Limited monopolies for creators
- Lockean labor theory of property: possession of rights comes from labor invested
- Hegelian personality theory: our intellectual creations are part of us
What is special about intellectual artifacts

*Intellectual artifacts*

- Persist over time, rather than dissipate
- Can be used by an unlimited number of persons at a time
- Are built to a greater degree on the previous work of others

Limitations on intellectual property

- *Fair use*: copying for purposes of criticism, comment, news reporting, teaching, scholarship, research
- Time limitation
- Not all information is eligible
- Want a public domain as well (like the natural environment), as common intellectual property
Civil vs. criminal law

<table>
<thead>
<tr>
<th>Civil</th>
<th>Remedy</th>
<th>Standard</th>
</tr>
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<tbody>
<tr>
<td>Civil</td>
<td>payment of damages to injured party</td>
<td>preponderance of evidence</td>
</tr>
<tr>
<td>Criminal</td>
<td>prison or fine</td>
<td>proof beyond a reasonable doubt</td>
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Peer-to-peer file sharing

- P2P is distinguished from communications with central server
- Napster software enabled P2P exchange of files listed in a directory on a central server
- Courts shut down Napster for enabling copyright violations
- KaZaA: true P2P application
- After courts refused to shut down similar Grokster and Morpheus sites, RIAA sued 261 users, Fall 03
Fair use

- Recognized by 1976 law
- Criticism, comment, news reporting, teaching, scholarship, research
- Factors:
  - Purpose of use (commercial or not)
  - Nature of work (fiction less likely to be fair use)
  - Size of material copied
  - Effect on market value
- Copying video for later viewing is fair use (Sony case, 1984)

How IT changes the discussion

- Information is interchangeable (homologous) regardless of its medium (paper, silicon, DNA, DVD)
- Hence “the medium is not the message; the medium is irrelevant”
- Intellectual property rights have been legally expanded in copyright and then patent form
- Microsoft owns code in PCs; patents exist for some genes of humans
Copyright infringement criminalized

- 1982, Congress made high-volume copying of music and video a felony
- 1992, copying for gain became a 5-year felony
- 1997, No Electronic Theft Act following D. LaMacchia software-distribution case that lacked private gain
- Digital Millennium Copyright Act criminalized circumvention of copy-protection systems
- 2005, recording in a theater became a felony

5. Work, education, and the future

- What is work? What is education?
- Are Facebook, YouTube, and Twitter part of work life?
- How do people learn?
- Is the classroom doomed?
- What is the place of online learning?
- What is the place of laptops in the classroom?
- Will computers and robots replace us?
Subtopic objective

7.5  Describe how information technology affects work, education, and the future

Results of the information revolution

• Individualization of work
• Increased fragmentation and connectedness of society
• Evolution of education as collaboration and as learner’s construction of own knowledge
• Centralization and decentralization of power and production
• Social polarization
• Cultural changes
IT and employment

- *IT industry*: $1 trillion worldwide, 2005
- *IT jobs*: 10.5 million in U.S., 2004
- *Job churn*: 1993-2002, 310 million jobs disappeared; 328 million new jobs were created
- New jobs created by IT tend to require higher education, replacing old jobs that did not
- *Offshoring*: About 3.3 million white collar jobs will have left U.S., 2000-2015

Work in the informational era

- A fundamental change in work: “the individualization of labor in the labor process”
- A reversal of the socialization of production
- Management becomes decentralized, markets become customized, work segmented, and societies fragmented
- Work time, job stability, location of work, and the social contract between employer and employee undergo changes
IT in education

- Custom preparation of course materials
- Communication by students outside classroom
- Collaboration tools
- Research access
- Self-construction of knowledge
- IT at FSU
  - Learning with IT
  - Learning about IT

Collaborative learning

- Students reinforce their own learning by supporting each other’s learning
- *Example*: a student who has just learned a concept may know just the words to help another overcome a conceptual obstacle
- Software and communications technology, e.g., Web 2.0, support collaboration
How the cloud affects work

- *Cloud computing* is the use of online software and storage
- Computing power and storage are accessed from off-site as needed, rather than as available on site
- Sharing and collaboration replace reliance on middle management; work is “analytical, experimental, faster, more data driven”
- *Example*: Amazon is run as “a federation of autonomous groups”

Lifelong learning about IT

*Motivation:*
- Relationship of humans to IT changes and grows
- Change in role of computer
- Long-term use/learning strategy abstracts from details
- Users need to know limits of computation
- Some may wish to consider IT career
Computers vs. brains

- In the brain, computation is interaction among 100 billion neurons
- Neurons are cells that fire (signal other neurons) when incoming signals reach a certain threshold
- The brain adapts by modifying its internal neuron connections
- Other parts of human memory and information processing are muscles, hormones, and glial cells

Debates about artificial intelligence

- Strong AI view: an AI system may be intelligent
- Refutation based on phenomenology (study of experience): machines are said to lack the experience of thought
- Argument based on intentionality: machines are said not to be referencing actual things in the world
- Comparisons: artificial sweeteners; insemination; flowers
Robots in education and manufacturing

• 2-foot-high NAO robots interact well with autistic children in schools
• Small $20K robots are used in small machine shops
• Driverless cars are being tested
• $500 flying drones are available
• Public discussions occur about ethical requirements for robot behavior; e.g., weapons that choose their targets

Where are we going with IT?

• Predicting accurately about IT has been difficult
• Technological singularity: the point at which machine intelligence reaches too far for us to see what is beyond
• Will we still be human when we can implant Internet interfaces in our brains?
References

