Social Implications of a Computerized Society

Lecture 1

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Outline

- Applications, Benefits and Problems of Computers.
- We will talk about <u>problems</u> later.
- Key concepts and issues:
  - Different types of benefits (economic, efficiency, convenience, new personal opportunities, better government)
  - Do computers make old problems worse? How?
  - Do computers introduce new problems?
  - Where can we look for solutions: law, technology, education, the marketplace?

INTRODUCTION

Change is Rapid

1940s: First computer was built.

1956: First hard-drive disk weighed a ton and stored five megabytes.

1991: Space shuttle had a one-megahertz computer. Ten years later, some automobiles had 100-megahertz computers. Speeds of several gigahertz are now common.

Computers are everywhere

- taking and sharing pictures
- downloading music and watching videos
- checking email and playing games
- banking and managing investments
- finding maps

"The most important technological discovery of the last few decades is that computers can be used for many purposes other than calculation." (Leslie Valiant)

The Good and the Bad: Questions for the Class

1. How many believe computers are increasing unemployment in Canadian society?
2. How many believe computers databases are a serious threat to personal privacy? Any ones in particular?

Please try the Canvas survey "Intro Questions"

Group Discussion Questions

1. Do you think computers in the future will understand language?

2. Do you believe computers will eventually really think?

3. What is your favourite computer application/use?

4. What application not yet existing would you like to see most in the future?

5. What for you is the worst aspect of computers?

Examples

IMPACT OF NEW TECHNOLOGY

Some Positive Impacts of New Technology:

- Convenience
- Efficiency
- Reliability: decrease error rates
- New types of jobs.
- Infrastructure: More options for communication, transactions.

Negative Impacts of New Technology

- Job Losses
- Abuse by bad actors (criminals)
- Detrimental to health (physical and mental)
- Complexity ➔ more errors
- Concentration of power

Cell Phones: Benefits

- Relatively few in 1990s. Approximately five billion worldwide in 2011.

- Used for conversations and messaging, but also for:
  - taking and sharing pictures
  - downloading music and watching videos
  - checking email and playing games
  - banking and managing investments
  - finding maps, routes

- What is your favourite use?

Cell Phones: Problems

- Location tracking raises privacy concerns.
- Cameras in cell phones affect privacy in public and non-public places.
- Cell phones can interfere with quiet and concentration.
- Talking on cell phones while driving is dangerous.
- Other unanticipated negative applications:
  - terrorists detonating bombs
  - rioters organizing looting parties.
- *"While all this razzle-dazzle connects us electronically, it disconnects us from each other, having us "interfacing" more with computers and TV screens than looking in the face of our fellow human beings. Is this progress?"*
  Jim Hightower, radio commentator, 1995

- What is your biggest concern?

Social Networks

- First online social networking site was www.classmates.com in 1995.

- Facebook was started at Harvard as an online version of student directories

- Now 2.89 Billion user

Social Networks: Benefits

- Easily share part of our lives.
- Businesses connect with customers.
- Organizations seek donations.
- Groups organize volunteers.
- Protesters organize demonstrations and revolutions.
- Individuals pool resources through "crowd funding".
- What is your favourite use?

Social Networks: Problems

- Stalkers and bullies.

- Jurors tweet about court cases during trials.

- Socialbots simulate humans.

- Misinformation hurts democratic debate

- Facebook use correlates with depression
  - Recent whistleblower has leaked internal documents exposing potential harms

- What is your biggest concern?

The Internet and Communication

- In the 1980s, email messages were short and contained only text.

- People worldwide still use email, but texting, tweeting , and other social media are now preferred.

- Creating and sharing videos is possible at a huge scale – the Youtube culture

Internet Communication: Benefits

- Non-invasive; read at recipient's convenience.
- Saves time
- Free Access to vast amounts of information - **empowerment.**
  - including user fora, Craigslist
- Much information on WWW is free.
- Public fora not limited to geographic boundaries.
- More independence.
- More options for communicating.
  "Many-to-many" medium; TV/radio are "one-to-many".

Internet Communication: Problems

- Contributes to Alienation, Isolation (?)
- Hacking, Computer Crime
- Scale back of customer service
- Enables piracy, violation of copyright
- Facilitates government surveillance (Edward Snowden)
- Your biggest concern?

Medical Computing

- Software controls pacemakers that sense abnormal heartbeat and give a low-voltage shock to the heart.

- MRI imaging, CT scans for diagnosis.

- Joystick surgery: software filters out shaky movements by physician.

- Telemedicine: Remote performance of medical exams and procedures, including surgery.

- Record keeping: quick access to your record in the hospital.

Benefits Computers Bring to Medicine

- Sophisticated imaging.
- Reduced surgery time.
- Training surgeons.
- Patient monitoring.
- Improved treatments.
- Fewer errors.
- Faster paperwork (reports, referrals, records)
- But also more paperwork?

Q: How does your doctor make use of computers? Would you use a computerized diagnosis system? Instead of a doctor?

E-Commerce

- Amazon.com started in 1994 selling books on the Web. It has grown to be one of the most popular, reliable, and user-friendly commercial sites.

- eBay.com facilitates online auctions and second-hand sales.

- Traditional brick-and-mortar business have established Web sites.

- Online sales in the United States now total hundreds of billions of dollars a year.

E-Commerce: Benefits

- Sellers can sell directly to buyers
  - larger choice, lower prices
  - A new type of economy: Peer-to-peer
- Convenience
- Your favourite use?
- Take canvas survey "e-commerce"

E-Commerce: Problems

Trust concerns:

- People were reluctant to provide credit card information to make online purchases.

- Solutions:

  - PayPal.com grew out of need for trusted intermediary to handle payments.

  - Encryption and secure servers made payments safer.

  - The Better Business Bureau established a Web site to help consumers see if others have complained about a business.

  - Auction sites implemented *rating systems.*

Benefits of Computers in Reducing Paper Use and Garbage

- Send/receive digital documents instead of hardcopy.
- Read, write, and edit online.
- Cost-saving; smaller storage needed.
- Creation of toxic wastes at paper mills reduced.

Q: Have computers reduced paper use in your school or workplace?

CHALLENGES AND SOLUTIONS

Themes of Technology Challenges

- Old problems in a new context: crime, pornography

- Adapting to new technology: thinking in a new way

- Global reach of Net: ease of communication with distant countries

- Problem/solution cycle: natural part of change and life

Themes of Solutions

- Trade-offs and controversy
  - Increasing security means reducing convenience.
- Perfection is a direction, not an option.
  - SWOT analysis aims to be more comprehensive
  - Positive + negative view = realistic view
- Different criteria for personal choices, business policies, government, and law.
- A variety of sources:
  - Technology.
  - Law.
  - Education.
  - The market.

Undergraduate Writing Contest

- Maybe your term paper can make it to the SFU Writing Contest
- See course website