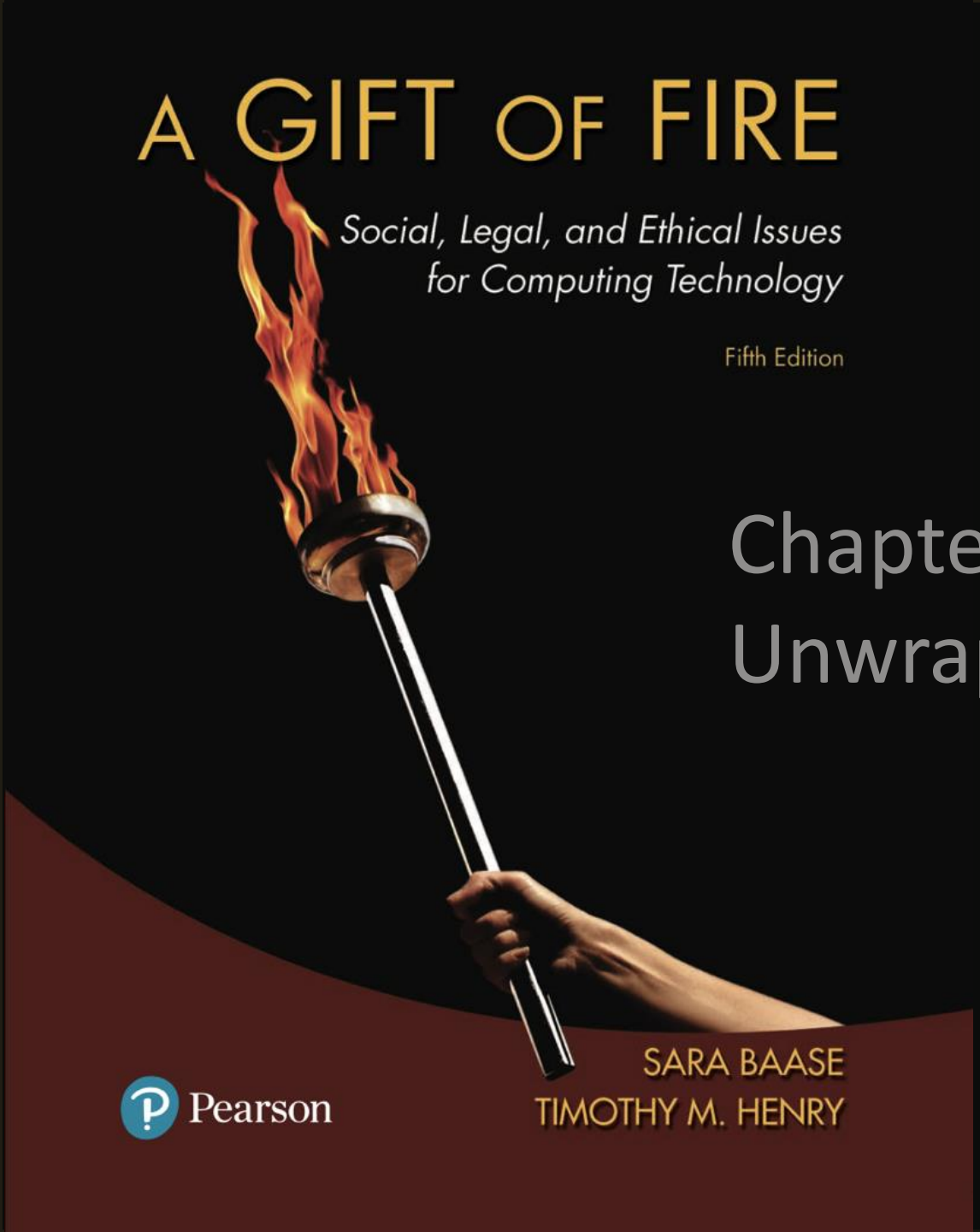

Chapter 1: Unwrapping the Gift

Based on slides prepared by Cyndi Chie, Sarah Frye and Sharon Gray.
Fifth edition updated by Timothy Henry

What We Will Cover

- The Pace of Change
- Change and Unexpected Developments
- Themes of Technology Challenges
- Ethics

The Pace of Change

"In a way not seen since Gutenberg's printing press that ended the Dark Ages and ignited the Renaissance, the microchip is an epochal technology with unimaginably far-reaching economic, social, and political consequences."

– Michael Rothschild[1]

Pearson

The Pace of Change

- 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.

Change and Unexpected Developments

"It is precisely this unique human capacity to transcend the present, to live one's life by purposes stretching into the future – to live not at the mercy of the world, but as a builder and designer of that world – that is the distinction between human and animal behavior, or between the human being and the machine."

– Betty Friedan[3]

Pearson

Change and Unexpected Developments

Cell Phones

- 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
- Smartphone apps for many tasks, including:
  - monitoring diabetes
  - locating water in remote areas

Pearson

Change and Unexpected Developments

Cell Phones:

- Location tracking raises privacy concerns.
- Cameras in cell phones affect privacy in public and non-public places.
- Cell phones can interfere with solitude, quiet and concentration.
- Talking on cell phones while driving is dangerous.
- Other unanticipated negative applications: teenagers sexting, terrorists detonating bombs, rioters organizing looting parties.

Change and Unexpected Developments

Kill switches

- Allow a remote entity to disable applications and delete files.
- Are in operating systems for smartphones, tablets and some computers.
- Used mainly for security, but raise concerns about user autonomy.

Change and Unexpected Developments

"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[7]

Pearson

Change and Unexpected Developments

Social Networking:

- First online social networking site was www.classmates.com in 1995.
- Founded in 2003, Myspace had roughly 100 million member profiles by 2006.
- Facebook was started at Harvard as an online version of student directories
- Social networking is popular with hundreds of millions of people because of the ease with which they can share aspects of their lives.

Pearson

Change and Unexpected Developments

Social Networking:

- Businesses connect with customers.
- Organizations seek donations.
- Groups organize volunteers.
- Protesters organize demonstrations and revolutions.
- Individuals pool resources through “crowd funding”.

Pearson

Change and Unexpected Developments

Social Networking:

- Stalkers and bullies stalk and bully.
- Jurors tweet about court cases during trials.
- Socialbots simulate humans.

Change and Unexpected Developments

Communication and the Web

- 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.

Change and Unexpected Developments

Communication and the Web

- Blogs ("Web log") began as outlets for amateurs wanting to express ideas, but they have become significant source of news and entertainment.
- Inexpensive video cameras and video-manipulation tools have resulted in a burst of amateur videos.
- Many videos on the Web can infringe copyrights owned by entertainment companies.

Change and Unexpected Developments

Telemedicine

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

Change and Unexpected Developments

Collaboration

- Wikipedia: The online, collaborative encyclopedia written by volunteers.
- Informal communities of programmers create and maintain free software.
- Watch-dogs on the Web: Informal, decentralized groups of people help investigate crimes.

Change and Unexpected Developments

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.
- Traditional brick-and-mortar business have established Web sites.
- Online sales in the United States now total hundreds of billions of dollars a year.
- Sellers can sell directly to buyers, resulting in a peer-to-peer economy.

Change and Unexpected Developments

E-commerce and trust concerns

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

Pearson

Change and Unexpected Developments

Free stuff

- Email programs and email accounts, browsers, filters, firewalls, encryption software, word processors, spreadsheets, software for viewing documents, software to manipulate photos and video, and much more
- Phone services using VOIP such as Skype
- Craigslist classified ad site
- University lectures

Change and Unexpected Developments

Free stuff

- Advertising pays for many free sites and services, but not all.
- Wikipedia funded through donations.
- Businesses provide some services for good public relations and as a marketing tool.
- Generosity and public service flourish on the Web. Many people share their expertise just because they want to.

Change and Unexpected Developments

Free stuff

- In order for companies to earn ad revenue to fund multimillion-dollar services, many free sites collect information about our online activities and sell it to advertisers.

Change and Unexpected Developments

Artificial intelligence

- A branch of computer science that makes computers perform tasks normally requiring human intelligence.
- Researchers realized that narrow, specialized skills were easier for computers than what a five-year-old does: recognize people, carry on a conversation, respond intelligently to the environment.

Change and Unexpected Developments

Artificial intelligence

- Many AI applications involve pattern recognition.
- Speech recognition is now a common tool.

Change and Unexpected Developments

Artificial intelligence

- Turing Test: If the computer convinces the human subject that the computer is human, the computer is said to “pass”.

Change and Unexpected Developments

Discussion Questions

How will we react when we can go into a hospital for surgery performed entirely by a machine? Will it be scarier than riding in the first automatic elevators or airplanes?

How will we react when we can have a conversation and not know if we are conversing with a human or a machine?

How will we react when chips implanted in our brains enhance our memory with gigabytes of data and a search engine? Will we still be human?

Change and Unexpected Developments

Robots

- Mechanical devices that perform physical tasks traditionally done by humans.
- Can operate in environments that are hazardous for people.

Change and Unexpected Developments

Smart sensors, motion, and control

- Motion sensing devices are used to give robots the ability to walk, trigger airbags in a crash, and protect laptops when dropped.
- Sensors can detect leaks, acceleration, position, temperature, and moisture.

Change and Unexpected Developments

Tools for disabled people

- Assistive technology devices help restore productivity and independence to people with disabilities.
- Researchers are experimenting with chips that convert brain signals to controls for leg and arm muscles.

Themes of Technology Challenges

- Old problems in a new context: crime, pornography, violent fiction
- Adapting to new technology: thinking in a new way
- Varied sources of solutions to problems: natural part of change and life
- Global reach of Net: ease of communication with distant countries

Pearson

Themes of Technology Challenges

- Trade-offs and controversy: Increasing security means reducing convenience.
- Perfection is a direction, not an option.
- There is a difference between personal choices, business policies, and law.

Ethics

What is Ethics:

- Study of what it means to “do the right thing”.
- Assumes people are rational and make free choices.
- Rules to follow in our interactions and our actions that affect others.

Ethics

A variety of ethical views:

- Deontological theories
- Utilitarianism
- Natural rights

Ethics

A variety of ethical views:

- Negative rights (liberties)
  - The right to act without interference
- Positive rights (claim-rights)
  - An obligation of some people to provide certain things for others

Ethics

A variety of ethical views:

- Golden rules
  - Treat others as you would want them to treat you.
- Contributing to society
  - Doing one's work honestly, responsibly, ethically, creatively, and well is virtuous.

Ethics

A variety of ethical views:

- Social contracts and a theory of political justice
  - People willingly submit to a common law in order to live in a civil society.

Ethics

A variety of ethical views:

- No simple answers
  - Human behavior and real human situations are complex. There are often trade-offs to consider.
  - Ethical theories help to identify important principles or guidelines.

Ethics

A variety of ethical views:

- Do organizations have ethics?
  - Ultimately, it is individuals who are making decisions and taking actions. We can hold both the individuals and the organization responsible for their acts.

Ethics

Some important distinctions:

- Right, wrong, and okay
- Distinguishing wrong and harm
- Separating goals from constraints
- Personal preference and ethics
- Law and ethics

Ethics

Discussion Question

Can you think of examples of liberties (negative rights) and claim-rights (positive rights) that are at opposition to each other?