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ILLINOIS INSTITUTE OF TECHNOLOGY

ITMT430

Impacts of Computing in the World

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Objectives

At the conclusion of this lesson, students should be able to:

- Recall and discuss social issues in information technology and related responsibilities of professionals in the field
- Analyze the local and global impact of computing on individuals, organizations, and society
- Explain what is meant by "The Digital Divide"

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Learning Objectives:

Upon completion of this lesson the students should be able to:

- Describe and discuss moral and ethical issues that define & surround the Digital Divide and proposals for its resolution
- Describe and discuss issues surrounding making technology available to people with disabilities
- Discuss the effect of information technology on racism

Learning Objectives:

Upon completion of this lesson the students should be able to:

- Discuss the impact of information technology on gender issues
  - Describe and discuss gender issues in employment in the technology field
- Explain and discuss the impact of information technology on democracy and democratic values

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Learning Objectives:

Upon completion of this lesson the students should be able to:

- Describe how information technology has transformed the nature of work and discuss its impact on the quality of work life

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What Is The Digital Divide?

◆ "The Digital Divide,"

- Phrase coined in 1990s
- New label for an old concept involving information "haves" and "have-nots" (Benjamin Compaine, 2011)

◆ Phrase now often used to describe disparity between those who have access to Internet technology and those who do not

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The Digital Divide

◆ Compaine defines the digital divide as "the gap, or the perceived gap," between those who have and those who do not have either:

a) access to information technology

b) the knowledge and ability to use that technology

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The Digital Divide

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◆ Discussions might suggest there is one overall divide—that is, a single divide as opposed to many "divides," or divisions

◆ Actually *multiple divisions* involving access to information technology

The Digital Divide

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◆ Kieron O'Hara and David Stevens (2006) describe three kinds of "divides," which involve divisions between:

- rich and poor people
- rich and poor regions
- rich and poor nations

The Digital Divide

◆ For our purposes, we will examine the digital divide as it exists at two distinct levels:

- a "global digital divide" *between developed and developing nations*
- a divide between groups *within developed nations*, based on factors such as income and education

The Global Digital Divide

◆ In 2000, estimate was that 429 million people—≈ 6% of Earth's population—were online globally

- 68% lived in North America and Europe
- Two billion people had no electricity
- In developing countries roughly 69 phones for every 1000 people (*2000 Human Development Report*)

◆ In 2016, 50.1% of the world's population had Internet access (http://www.internetworldstats.com)

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Some Statistics from the 2000 *Human Development Report*

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◆ In 2000, the developing nation of Nepal had

- approximately 35,000 Internet users in a population of 21 million people

- (now almost 6 million in a population of 31 million)

- only 15% of houses with electricity (*2000 Human Development Report*)

Some Statistics Noting Growth Between 2000 and 2005

◆ Global Internet usage more than doubled between 2000 and 2005

- ▪ In late 2005, it was estimated that there were more than 972 million Internet users (*Internet World Stats News*, 2005)

- ▪ By 2005, seven nations had an Internet penetration rate of higher than 60%, and the list of countries or regions where more than 50% of the population used the Internet had grown to 30 (*Internet World Stats News*, 2005)

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Some Statistics as of 2016

◆ 2016: estimated 3.676 billion Internet users; 50.1% of world population

◆ Yet, disparity between percentage of Internet users in developed and developing countries still significant

- In India, for example, the penetration rate for Internet users in 2014 was 19.7%, jumping to 36.5% in 2016, while in the United Kingdom it was 91.6%

- Many users' only access is through mobile devices, especially smartphones

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2016 Statistics

◆ Current disparity is especially apparent when viewed from the perspective of continents or world regions

◆ For example, in Africa, with 16.2% of the world's population, Internet penetration rate was 28.7%, but in North America with only 4.9% of the world's population, the Internet penetration rate was 89%

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2016 Statistics

◆ However, Internet usage growth in Africa between 2000 and 2016 was 7,448.8% (wow!)

◆ William Wresch (2009) notes that in a 33-month period during those years there was a 60% growth in the number of African Web sites

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2016 Statistics

◆ Initially, it might be encouraging that some reports describe such growth in Internet usage at the global level

◆ Yet, despite progress made on the African continent, critics worry that much more work still needs to be done to narrow, and perhaps one day even bridge, the global divide

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The Digital Divide Within Nations

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◆ Surprisingly, perhaps, significant discrepancies still exist involving access to information technology within developed nations

◆ Kieran O'Hara and David Stevens (2006) point out such discrepancies in the UK

- They note that in 2004, approximately one half of all households were online, but only 3% of the poorest households were included in this number

The Digital Divide Within Nations

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◆ Also significant disparities exist within some developing nations as well

◆ In India, for example, the divide appears to be exacerbated for two reasons:

- a growing segment of the population who are fluent in English and have the technical literacy required to be able to work in the many skilled jobs outsourced there are doing very well

- those on the other side of the divide—the majority of the population—who have low levels of literacy + little or no access to information technology are not doing very well

The Digital Divide in the U.S.

◆ In the U.S., discussions about the digital divide have focused on factors such as:

- income

- education

- race

- gender

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The Digital Divide in the U.S.

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◆ In the 1990s, a National Information Infrastructure (NII) was proposed to ensure all Americans would have access to information technology

◆ The National Telecommunications and Information Administration (NTIA) conducted a series of studies on computer use among various groups

The Digital Divide in the U.S.

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◆ Early NTIA reports confirmed that access to information technology was related to socio-demographic factors

◆ Later NTIA reports noted that:

- rate of access to information technology in the U.S. had increased overall

- significant disparities still existed with respect to socio-demographic factors involving race, education, income, and marital status

Digital Divide in the US: Universal Service vs. Universal Access

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◆ The US Congress passed the Communications Act of 1934, distributing the cost for telephone service to be affordable to all Americans, i.e., providing *universal service*

◆ Telephone users still pay a universal connectivity fee, or surcharge, to support universal service

Universal Service vs. Universal Access

◆ Should a universal service policy for the Internet be subsidized in a similar manner?

◆ In the case of telephone technology, it was argued that having a telephone was necessary for well being

◆ Can the same argument be made for information technology?

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Universal Service vs. Universal Access

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◆ Universal service policies are controversial because they require subsidies, often resulting either in user fees or higher taxes

◆ Advocates of a *universal service* policy for the Internet note that without a government subsidy, people living in less-populated rural areas would not have been able to afford telephone service

◆ Critics of universal service argue that Americans already have *universal access* to information technology, e.g., public points of access such as in libraries

Universal Service vs. Universal Access

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◆ Some argue the U.S. government should provide in-home Internet service for all K-12 students whose families cannot afford to pay for it

- The government mandates all school-age children receive free public education
- The government is required to provide those children with resources necessary to complete their education

Universal Service vs. Universal Access

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- Today, in-home Internet service is a critical resource for students to be able to complete homework assignments
- School-aged students whose families cannot afford in-home Internet service are at a significant disadvantage
- Students whose families cannot afford Internet service should have that service subsidized by government funding

◆ Is this argument convincing?

The Digital Divide as an *Ethical Issue*

◆ Is the digital divide an *ethical* issue?

◆ Is every kind of divide regarding unequal access to goods necessarily an ethical issue?

- For example, skeptics have pointed out that there is a divide between those who have and do not have Mercedes-Benz cars, and many of us fall on the "wrong side" of the "Mercedez-Benz Divide"

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The Digital Divide as an *Ethical Issue*

◆ Is the divide affecting unequal access to information technology similar to the "Mercedes-Benz Divide"?

◆ Or is it closer to divisions involving access to vital human resources such as food and healthcare?

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The Digital Divide as an *Ethical Issue*

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◆ Many ethicists believe that divisions between those who do and do not have access to vital resources, such as food and healthcare, raise questions of *distributive justice*

◆ Distributive justice refers to "just distribution" of primary goods and resources in populations

Distributive Justice

◆ What, exactly, do we mean by "distributive justice" in the context of info technology?

◆ According to Jeroen van den Hoven and Emma Rooksby (2008):

Distributive justice in contemporary information societies concerns, among other issues, the *distribution of information, information services, and information infrastructures* [Italics Added]

◆ Van den Hoven and Rooksby's view is influenced by John Rawls' theory of justice and "primary social goods"

Distributive Justice and Rawls

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◆ In his classic work, *A Theory of Justice*, Rawls describes *primary social goods* as "resources that satisfy basic human needs and thus have a special value or moral weight in society"

◆ Rawls notes that with these goods, humans "can generally be assured of greater success in carrying out their intentions and in advancing their needs"

◆ Van den Hoven and Rooksby extend Rawls' notion of primary social goods to include "information goods"

Bridging the Digital Divide

◆ Jeremy Moss (2002) argues that people in developing countries who do not have access to information technology are unfairly disadvantaged because they:

  i. are denied access to knowledge

  ii. are unable to participate fully in democratic decision making processes

  iii. have prospects for economic growth that are hindered

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Bridging the Digital Divide

◆ Pippa Norris (2001) believes that "the underclass of the "information poor" may become "further marginalized in societies where basic computer skills are becoming essential for economic success and personal advancement"

◆ Norris also notes that these skills are necessary for "entry to good career and educational opportunities," as well as "full access to social networks…and opportunities for civic engagement"

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Do We Have a Moral Obligation to Bridge the Digital Divide?

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◆ If Moss and Norris are correct, it would seem that we have a moral obligation to provide access to those who are disadvantaged?

◆ However, some argue that we are morally obligated *only* to "do no harm"

- For example, they believe we have no explicit "obligation to do good"—in this case, no obligation to provide Internet access to disadvantaged groups

◆ But we can question whether a "minimalist" view of morality is adequate

Do We Have a Moral Obligation to Bridge the Digital Divide?

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◆ Maria Bottis and Kenneth Himma (2008) note that some important points of clarification are needed to make the case that "affluent nations" have a moral obligation to do bridge the divide

◆ They also point out that we need to draw an important distinction between saying that:

- ▪ "X is a good thing to do"
- ▪ "We are obligated to do X"

Do We Have a Moral Obligation to Bridge the Digital Divide?

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◆ Bottis and Himma believe most people would likely agree that eliminating the digital divide would be "a good thing to do"

◆ But they also note that there would likely be far less consensus as to whether we – i.e., some affluent nations – have an obligation to do it

Do We Have a Moral Obligation to Bridge the Digital Divide?

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◆ Himma (2007) points out that because many people believe that we are morally obligated *only* to do no harm, those people tend to infer that we have no moral obligation to bridge the digital divide

◆ But Himma also argues that this view is "inconsistent with the ethics of every classically theistic religion as well as our ordinary intuitions," as well as with most ethical theories

Information Technology & the Disabled

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◆ The World Wide Web Consortium (W3C) was formed to, among other things, promote standards that ensure universal Web access

◆ W3C established a Web Accessibility Initiative (WAI), which has produced guidelines and protocols for developing software applications that improve access for disabled persons

Information Technology & the Disabled

◆ WAI applications range from software used in speech synthesizers and screen magnifiers to proposed applications that will benefit disabilities that are:

- visual
- hearing
- physical
- cognitive
- neurological

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Information Technology & the Disabled

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◆ WAI has established guidelines for developing "user agents" that are:

- intended to lower barriers to Web access for people with disabilities
- designed to conform and communicate with "assistive technologies" such as screen readers (performing a function similar to Braille in off-line contexts)

Information Technology & the Disabled

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◆ Frances Grodzinsky (2000) argues that computers equipped with assistive technologies and "adaptive devices" can be an "equalizer" in the era of information technology

- For example, they enable disabled persons to participate in and compete for jobs that require computer access

Disabled Persons and Remote Work

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◆ Has the practice of *remote work*—made possible by technology that enables employees to work outside the traditional workplace, typically in their homes—benefited or harmed disabled persons?

◆ N. Ben Fairweather (1998) acknowledges remote work has provided opportunities to some disabled workers who otherwise would be denied access to a job

Disabled Persons and Remote Work

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◆ But Fairweather worries that for some disabled employees, especially those who are capable of working in both conventional and remote workplace settings, remote work can also have unfortunate consequences

◆ He worries that a company's remote work policies might provide employers with a convenient scheme for keeping disabled workers out of physical workplaces

Disabled Persons and Remote Work

◆ Fairweather believes that this troubling for three reasons:

1. It affects worker autonomy
2. Can be used to "hide" disabled workers
3. Provides employers with an excuse not to make the physical workplace compatible with laws such as ADA

Arguments for Continued WAI Support for Disabled Persons

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◆ Despite questions surrounding the potential downside of remote-work practices for disabled persons, there are many examples in which WAI's assistive and adaptive technologies have clearly benefited disabled workers

◆ So, on balance, WAI has made a difference for many disabled persons who desire to compete for jobs in the contemporary workplace

Arguments for Continued WAI Support for Disabled Persons

◆ But some critics might ask why we should continue to fund WAI initiatives, which can be very expensive, especially given that disabled persons comprise a relatively small portion of the overall population

◆ WAI proponent Cheiko Asakawa (2012) argues that access to technology is not simply a privilege but rather a "human right"

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Arguments for Supporting WAI

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◆ Other WAI supporters point out that some technology-related measures taken for the disabled have had positive outcomes for other groups

◆ Some also believe that voice recognition technology designed to assist disabled persons unable to use keyboards will ultimately benefit nondisabled persons with low literacy skills

Arguments for Supporting WAI

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◆ WAI advocates also point out measures taken for the disabled have had positive outcomes for other groups:

- ▪ poor people who often are forced to deal with literacy problems have benefited
- ▪ ramps designed for wheelchair accessibility not only benefit people in wheelchairs, but also non-disabled persons as well (such as parents pushing baby carriages)

Arguments for Supporting WAI

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◆ Some argue ordinary users will likely continue to benefit from design enhancements to user interfaces intended to assist disabled persons

◆ But there is a danger in using this kind of utilitarian argument as the main rationale

- For example, suppose that some enhancements do not benefit non-disabled persons as well?

- Should we then cease to fund research for those kinds of technologies that support the disabled?

Race and Information Technology

◆ Background: Consider some statistics ranging from 2000 to 2011 that correlate race with the U.S. digital divide

◆ In 2000, 51% of all homes had at least one computer, and 41.5% of all homes had Internet access

  ▪ From the vantage point of race, 46.1% of white Americans and 56.8% of Asian Americans and Pacific Islanders had access, contrasted with only 23.5% of African Americans and 23.1% of Hispanics who did in 2000

Race and Information Technology

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◆ By 2011, statistics for African American vs. white users had changed significantly

- While Internet usage among whites was estimated to be 88%, the rate of African American Internet usage had grown to 80%

- Perhaps even more interesting was the rate at which the use of access to broadband Internet connection had grown for African Americans

- Whereas 65% of African American Internet users had broadband access, only 53% of white American Internet users enjoyed this service
  - (May be "urban versus rural" divide)

Race and Information Technology

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◆ We focus mainly on two different kinds of issues affecting race and information technology:

1. Internet usage patterns among minority groups

2. Ways in which the Internet has been used as a medium to spread racial prejudice

Race and Information Technology Issues Affecting Usage Patterns

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◆ Susan Kretchmer and Rod Karveth (2001) note that in studies involving African-Americans:

- average age for African-American Internet users tends to be younger than for whites

- African Americans typically tend to access the Internet less frequently than whites

- adult African American Internet users are much more likely than their white counterparts to have modest incomes, no college degrees, and children under eighteen

Race and Information Technology Issues Affecting Usage Patterns

◆ Kretchmer and Karveth also claim African-American Internet users are:

- *more likely* to use the Internet for entertainment and for locating information about quality-of-life activities, such as job training, school, health care, and hobbies

- *less likely* to participate in Web-based auctions, and to use e-mail to develop and sustain friendships

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The Internet as a Medium to Spread Racist Speech

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◆ Lynn Theismeyer (1999) believes two distinct kinds of racist speech can be found on the Internet:

a) *hate speech* itself, which can include text, music, online broadcast, and images that exhort users to act against targeted groups

b) *persuasive rhetoric* that does not directly enunciate racism and corresponding violence, but which ultimately promotes or justifies it

Racism and Rhetoric on the Internet

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◆ In her analysis of racist rhetoric on the Internet, Theismyer examines two questions:

I. Does information technology make the reemergence of prejudicial messages and attitudes swifter and more likely?

II. Does the Internet's wide range of distribution make for more followers of racial prejudice, and finally more persuasion?

Racism and Rhetoric on the Internet

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- ◆ Theismeyer concludes it is impossible to know at this point whether information technology has been the main cause of the rapid spread of racism, especially the neo-Nazism movement, in recent years
- ◆ However, she is convinced that information technology has been its principal tool

Gender & Information Technology

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◆ The gap that has traditionally existed between the percentage of female and male Internet users in the United States has changed significantly since some studies that were conducted in (or before) 2000

◆ According to a 2005 report by the *Pew Internet & American Life Project*, young women were slightly more likely to be online than young men, and the number of black women online surged between 2002 and 2005; black women who used the Internet outnumbered black men by about 10%

Gender & Information Technology

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◆ Pew Internet-Project surveys conducted in 2005 also showed that in the United States, 66% of women went online, as opposed to 68% of men

◆ But one possible reason why the percentage of male Internet users in the U.S. was higher than female users in 2005, is because woman make up a greater share of the overall U.S. population

◆ By 2008, proportion of women overall who used the Internet was equal to that of men

Gender & Information Technology

◆ In recent *Pew Internet & American Life Project reports,* gender gap is essentially gone by 2014 with only a 1% difference in internet use

- Overall in U.S. 87% men, 86% women
- African-Americans: 81% men, 80% women

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Gender & Information Technology

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◆ While the gap between female and male Internet users has virtually disappeared in the U.S., and has narrowed considerably in many other Western countries as well, this has not been the case globally

◆ Leslie Shade (2002) describes how some women in the Philippines, Latin America, Africa, and Asia have developed "grass-roots" initiatives, referred to as "globalizing from below," to address the technology gap

Gender & Information Technology

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◆ Shade also notes that at the second Global Knowledge Conference, held in Malaysia in 2000, specific initiatives were introduced to support gender equity and women's empowerment using information technology

Gender & Information Technology

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◆ We focus on two distinct kinds of issues affecting gender:

1. access issues, i.e., access to jobs for women in the computing/engineering fields

2. gender bias in software applications, including video-games

Access Issues for Women

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◆ Access-related issues affecting computing include the "pipeline" for women entering the field of computer science (CS)

◆ In a classic study, Tracy Camp (1997) noted that the number of women earning PhDs in CS had increased slightly

◆ However, Camp also noted that the number of women getting BS degrees in CS had decreased

Gender and Access to High-Tech Jobs

◆ Kirlidog, Aykol, and Gulscecen (2009) cite more recent evidence to support ongoing concerns about the "pipeline"

- They argue that computing disciplines are still typically regarded as a "male profession," both in industry and academia

- They also believe that women remain in the "margins" of a male-dominated profession, which is filled with highly gendered expressions such as "killing or aborting programs," "workbench," "toolkit," etc., that reflect the masculine culture of the field

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Gender and Access to High-Tech Jobs

◆ Kirlidog, et al. also identify three "net results" of the "male-dominated computing profession," in which they claim women are:

1) under-represented in computer-related jobs

2) more under-represented in the managerial ranks in the computing field because of the 'glass ceiling'

3) earn less than men for doing the same jobs

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Gender and Access to High-Tech Jobs

◆ One question that has baffled researchers is: Why don't more women enter college degree programs in computing, particularly computer science (CS)?

◆ Paul De Palma (2005) considers and dismisses the view that women do not pursue CS careers because of "math anxiety"

- He notes that many women pursued degrees in mathematics, long before fields such as medicine and law were available to them

Gender and Access to High-Tech Jobs

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◆ De Palma infers that mathematics programs in higher education must have been doing something right in attracting and graduating women

◆ He suggests that if CS programs were more like mathematics programs than they currently are, perhaps more women would be attracted to them (yeah, right.)

Gender and Access to High-Tech Jobs

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◆ De Palma also notes that much of the high-tech culture associated with the early days of computing was dominated by males, who:

- tended to be fascinated with gadgetry and devices, as opposed to mathematics per se

- affected how programming courses were conceived of and taught

Gender and Access to High-Tech Jobs

◆ De Palma speculates that if course instruction in programming were designed to be as close as possible to logic and mathematics, women might find CS programs more attractive

◆ This would seem like an interesting hypothesis to test

◆ (Based on my experience I believe it to be patently false)

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Gender Bias in Video Games

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◆ Does gender bias exist in software development for video games technology?

◆ Elizabeth Buchanan (2000) argues that video games contribute to gender bias because many of them tend to:

1) *misrepresent* or to *exclude* female characters

2) perpetuate traditional *sexist stereotypes*

Gender Bias in Video Games

◆ Initially, we might be inclined to dismiss concerns about gender bias in video games on the grounds that many women aren't interested in these applications

◆ But Philip Brey (2008) argues that the question of gender bias in video games is "morally significant" because women will have less opportunity to enjoy computer games and their possible benefits, if computer games tend to be designed and marketed for men

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Gender Bias in Video Games

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◆ The "benefits," for which women would have less opportunity include greater "computer literacy," which Brey notes is an important quality in today's market place

◆ Brey also notes that many critics argue that the computer industry is mainly to blame for the gender gap that exists

- For example, critics point out that most game developers are male

Gender Bias in Video Games

◆ Brey also notes that there may be little interest on the part of software developers to design appropriate video games for women

◆ He notes that very few computer games include "decent role models" for women

- ▪ For example, he argues that "a disproportionate number of the female characters" in these games are strippers or prostitutes and that these characters tend to have "unrealistic body images"

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Gender Bias in Video Games

◆ It would seem that both Brey and Buchanan make a plausible case for:

- ▪ how the assumptions of developers designing video games can contribute to gender bias

- ▪ why gender bias is morally significant

◆ Recently we have seen "GamerGate"

- ▪ Has resulted in serious threats against game developer Zoe Quinn & feminist videogame critic Anita Sarkeesian

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Information Technology, Democracy, and Democratic Ideals

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◆ We have already analyzed equity-and-access issues pertaining to social/economic class (the digital divide), race, gender, and disabled persons

◆ Underlying many concerns involving these socio-demographic groups are issues that also affect democracy, more broadly, as well as democratic ideals and values in particular

◆ A number of interesting questions arise at the intersection of democracy and information technology

Information Technology, Democracy, and Democratic Ideals

◆ We examine two different kinds of questions affecting information technology and democracy:

1) has the use of information technology thus far enhanced democracy and democratic ideals, or has it threatened them?

2) what impact has information technology had so far on the political-election process in democratic nations?

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Democracy and Democratic Ideals

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◆ Democracy, when compared to alternative forms of government, seems an attractive political structure and, arguably, one of the fairest

◆ Because of these assumptions, Gordon Graham (1999) points out that it is difficult to get people, especially in the Western world, to engage in a serious debate about the merits of democracy

Democracy and Democratic Ideals

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◆ Graham correctly notes that democracy, along with its corresponding notion of a "democratic ideal," has won almost universal and largely unquestioning acceptance in the West

◆ Graham also notes that some political theorists and philosophers have not always regarded democracy as the best form of government

Democracy and Democratic Ideals

◆ For example, in *The Republic*, Plato was highly critical of democratic government and viewed it as a form of mob rule in which important decisions could be made by a citizenry that typically was not well informed on matters involving the state

◆ Even as late as the nineteenth century, philosopher John Stuart Mill questioned whether democracy was the ideal form of government

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Democracy and Democratic Ideals

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◆ From a personal perspective, my father always argued that the best form of government is "benevolent dictatorship"

- Frees the populous from concerns about politics as their perception is that the government sincerely has their best interests at heart—which may or may not be actually true

- In reality almost never occurs with what appears to be one significant exception: *Singapore*

Democracy & Information Technology

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◆ But we can assume, for the sake of argument, that democracy is superior to alternative political structures

◆ Does information technology favors democracy and democratic ideals?

Democracy & Information Technology

◆ Authors who believe that it does generally point to one or more of four factors, where the Internet is alleged to provide greater:

1) "openness" (i.e., an open architecture)
2) empowerment
3) choice
4) access to information

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Does Information Technology Threaten Democracy?

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◆ Lucas Introna and H. Nissenbaum (2000) suggest that Internet search engines threaten democracy because they "systematically exclude certain sites and certain types of sites, in favor of others"—a practice that they believe privileges some groups and some persons at the expense of others

◆ Alejandro Diaz (2008) raises a related concern when he asks whether Internet search technologies will filter out, and thus exclude, the kinds of "independent voices and diverse viewpoints" that are essential for a democracy

Does Information Technology Threaten Democracy?

◆ Eli Pariser (2011) believes that "personalization filters" now used by major search engines threaten democracy by contributing to political fragmentation and polarization

◆ He also fears that "personalization filters" are already having a negative impact for democratic societies because they enable a kind of "invisible autopropaganda," which can indoctrinate us with our own ideas

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Personalization Filters and Social/ Political Fragmentation

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◆ Pariser notes that while democracy "requires citizens to see things from one another's point of view," we are instead increasingly "more enclosed in our own bubbles"

◆ He also points out that while a democracy "requires a reliance on shared facts," we are instead being presented with "parallel but separate universes"

Social/Political Fragmentation and Polarization in Democracies

◆ To show why is this trend away from citizens having shared facts so dangerous for a democracy, Pariser examines the contentious debate about climate change in the U.S. that has taken place during the past decade

Social/Political Fragmentation and Polarization in Democracies

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◆ He notes that studies show that between 2001 and 2010:

- the views of people's beliefs about whether the climate was warming changed significantly, according to one's political party affiliation (Republican vs. Democrat)

- the number of Republicans who believed that the planet was warming fell from 49 to 29 percent, while the number of Democrats rose from 60 to 70 percent

Social/Political Fragmentation and Polarization in Democracies

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◆ One might ask how such a discrepancy regarding beliefs about climate change is possible among people living in the same country

◆ Pariser notes that an online search for "climate change" will turn up different results for persons that the search algorithm understands to be:

- an environmental activist vs. an oil company executive

- a Democrat vs. a Republican

Polarization and Deliberative Democracy

◆ With entrenched views about current controversial topics such as climate change, citizens in democratic countries such as the U.S. are becoming increasingly polarized

◆ Cass Sunstein (2001) worries that increased polarization threatens *deliberative democracy* – i.e., the process of rationally debating issues in a public forum

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Polarization and Deliberative Democracy

◆ Sunstein suggests that deliberative democracy may suffer irreparable harm because of the ways in which the Internet now filters information

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Polarization and Deliberative Democracy

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◆ Here is a formal statement of Sunstein's argument:

- Internet filtering schemes (a) provide people with information that reinforces ideas that they already hold, and (b) screen out novel information and different points of view

- Screening out novel information and different points of view will eliminate people's exposure to new ideas or to ideas that may question or conflict with their own

- Decreased exposure to different points of view can lead to greater isolation and polarization of citizens

- Increased isolation and polarization can encourage extremism and radicalism rather than fostering compromise and moderation

Polarization and Deliberative Democracy

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◆ Here is a formal statement of Sunstein's argument:

- Compromise and moderation are needed for the traditional give-and-take process in resolving differences in a public forum

- Technologies that screen out different points of view, lead to greater isolation and polarization, encourage extremism and radicalism, and prevent compromise and moderation tend to undermine deliberative democracy

- This brings us to the logical conclusion that the Internet tends to undermine deliberative democracy

The Impact of Information Technology on Political Elections in Democratic Nations?

ITMT 430

◆ We examine this impact in terms of two broad categories:

a) the use of electronic devices and social media sites to influence political outcomes

b) the use of political blogs to spread (false) information and influence election outcomes

The Use of Electronic Devices and Social Media

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◆ You may recall a political uprising that many in the news media now refer to as the "Arab Spring" – a political movement that began in January 2011 in Cairo, Egypt—which many might argue is now in "phase 2"

◆ When protestors there assembled and threatened to bring down Hosni Mubarak and his government, the Mubarak administration reacted immediately by shutting down the country's Internet services and mobile phone resources

The Use of Electronic Devices and Social Media

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◆ But protestors had already unified and planned out organized demonstrations via social media sites such as Facebook and Twitter before the online services in Egypt could be shut down (Ratti and Townsend, 2011)

Political Blogs and their Impact for the Democratic Process

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◆ During the 2008 U.S. presidential elections, extreme right-wing political bloggers reported that then presidential candidate Barack Obama was a Muslim and that he was not born in the United States

◆ At the same time, radical left-wing bloggers reported that vice presidential candidate Sara Palin's youngest child was really her grandchild and that Palin was protecting her unmarried daughter from embarrassment

Political Blogs and the Democratic Process

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- ◆ Neither blog that included stories about Obama and Palin was vetted in the way that a report submitted by a professional journalist working for a reputable news organization would be
  - ▪ Neither story would likely have been published in a reputable newspaper or magazine
  - ▪ But these stories were read online by numerous people, many of whom had assumed the reports to be true merely because they were published on the Internet
- ◆ Sadly, these kinds of stories can influence the way that some citizens vote

Employment and Work

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◆ We examine two different kinds of concerns affecting the impact of information technology on employment and work:

1. the *quantity* of jobs resulting from the use of information technology
2. the *quality* of work-life for employees in the digital era

Information Technology, the Quantity of Jobs and the Transformation of Work

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◆ Thus far, it is not clear whether information technology has either created or eliminated more jobs

◆ It is clear, however, that information technology has *transformed* the nature of work in the digital era

◆ Those arguing that information technology has reduced jobs point to the number of factory and assembly jobs that have been automated—and thus eliminated

Information Technology, the Quantity of Jobs and the Transformation of Work

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◆ Those claiming that information technology has created jobs, argue that it has introduced newer industries, such as computer support companies

◆ This *transformation*, or shift in jobs overall, can be analyzed in terms of two broad categories:

    I.   *job displacement* and automation

    II. *globalization* and *outsourcing*

Job Displacement and Automation

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◆ *Job displacement* can be measured in terms of the net result of jobs gained and lost

◆ Job displacement involving workers has been significantly affected by *automation*, where human workers were replaced by machines beginning with the Industrial Revolution in the 19th century

◆ Problem: first jobs to go are low-skilled, low-paying jobs

Job Displacement and Automation

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◆ "Luddites" (followers of Ned Ludd) reacted to automation in the textile industry by smashing machinery

◆ People who oppose new technology in the workplace today are sometimes referred to as "NeoLuddites" or even just "Luddites"

Robotics and Expert Systems as Forms of Job Displacement

◆ *Robots* have also either replaced or displaced many factory and "blue collar" workers

◆ *Expert systems* (ES programs) have replaced some highly-skilled professional workers

◆ Both have also raised ethical issues

- People have even posited scenarios in which an "expert administrator" system is programmed to "lie" or to mislead people in order to be an *expert at* its task

The Problem of RoboTrucks

◆ Currently there are 3.5 million truckdrivers and 233K cab/limo drivers in the U.S.

◆ Some forecast that by 2046 all vehicles will be autonomous

- ▪ This will displace 3.7 million (probably more by then) decently paying jobs for unskilled/semi-skilled labor

◆ Societal impact yet to be tabulated…

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Globalization and Outsourcing

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◆Torin Monahan (2005) defines *globalization* as

…the blurring of boundaries previously held as stable and fixed…between local/global, public/private [and] nation/world

Globalization and Outsourcing

◆Discussions of globalization tend to focus on concerns affecting:

- labor outsourcing
- international trade agreements
- immigration
- cultural homogenization

Globalization and Outsourcing

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◆ Our focus here is mainly on the economic aspects of globalization, particularly as they impact information technology and the workplace

◆ Trade agreements have made possible a new global economy, encouraging:

- greater competition between nations
- greater efficiency for businesses

Globalization and Outsourcing

◆ Some nations economies have been severely impacted by the loss of jobs that has resulted from globalization

◆ In the U.S., many manufacturing jobs, including traditional "blue-collar" jobs, as well as jobs in the service sector, have been exported "offshore"

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Globalization and Outsourcing

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◆ Outsourcing now also affects many highly-skilled "white collar" jobs, including jobs in the computing field

◆ Some programming jobs traditionally held by employees in American companies are being "outsourced" to companies in India and China, or even outsourced domestically to companies employing young H-1B visa foreign employees

Globalization and Outsourcing

◆ Ironically, the jobs of programmers, whose skills were essential to make remote work a reality, are now being outsourced to countries where programmers earn less money

◆ Steven Baker and Manjeet Kripalani (2005) suggest that career prospects of some American programmers may be less promising than in the past

The *Quality* of Work-life

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◆ Quality issues include concerns about employee health, which can pertain both to physical-and-mental-health related issues

◆ Two quality-related concerns involving the contemporary workplace result from:

1. *employee stress* and *workplace surveillance*
2. *computerized monitoring* (including the monitoring of an employee's electronic devices)

Employee Stress and Workplace Surveillance

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◆ A 2008 report on employee monitoring by the American Management Association noted that

- 43% of American companies monitor employee email

- 96% of those companies "track external (incoming and outgoing) messages"

◆ The report also noted that 45% of companies track the amount of time an employee spends at the keyboard

Employee Stress and Workplace Surveillance

ITMT 430

◆ Increasingly, companies now also monitor the blogosphere to see what is being written about them in various blogs, as well as what is said about them on social networking sites such as Facebook

◆ As a result of increased monitoring, many employees have been fired for misusing a company's email resources or its Internet connection, or both

◆ Some practices involving workplace monitoring have also contributed to increased employee stress

The Expansion of Workplace Surveillance

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◆ Joseph Kizza and Jackline Ssanyu (2005) describe factors that have contributed to the recent expansion and growth of employee monitoring, two of which are:

1) plummeting prices of both software and hardware

2) miniaturization of monitoring products

◆ Lower costs of software and hardware has made monitoring tools available to many employers who, in the past, might not have been able to afford them

◆ Miniaturization of monitoring tools has made it much easier to conceal them from employees

The Expansion of Workplace Surveillance

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◆ Lucas Introna (2004) points out that surveillance technology, in addition to becoming less expensive, has also become "less overt and more diffused"

◆ He also notes that current monitoring technologies have created the potential to build surveillance features into the "very fabric of organizational processes"

The Expansion of Workplace Surveillance

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◆ To support Introna's view, consider that monitoring tools are now being used to measure such things as the:

- number of minutes an employee spends on the telephone completing a transaction, such as selling a product

- number of minutes an employee spends on the telephone completing a transaction, such as booking a reservation

- number and length of employee breaks

Workplace Surveillance and Monitoring of Electronic Devices

◆ The case of *Ontario v. Quon* in California describes controversies involving monitoring of an employee's electronic pager

- Was Jeff Quon's privacy violated in this case?

- Did Quon have a reasonable expectation of privacy in this particular incident, as the lower court initially ruled?

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Workplace Surveillance and Monitoring of Electronic Devices

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◆ *Ontario v Quon*

- Should there be any limitations or constraints placed on an employer's right to monitor an employee's conversations on electronic devices?

- Or, should all forms of employee monitoring be permissible, where employer-owned equipment is involved?

Computerized Monitoring: Some Important Distinctions

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◆ Weckert (2005) points out that it is crucial to draw some distinctions involving two areas of computerized monitoring, which affect:

    1) the different *applications of monitoring*

    2) the different *kinds of work situations*

Computerized Monitoring: Some Important Distinctions

ITMT 430

◆ Regarding the *different kinds of applications*, Weckert notes that employees could be monitored with respect to the following kinds of activities:

- email usage
- URLs visited while Web surfing
- quality of their work
- speed of their work
- work practices (health and safety)
- employee interaction

Computerized Monitoring: Some Important Distinctions

ITMT 430

◆ With regard to the *different kinds of work situations*, Weckert believes that some further distinctions also need to be made

◆ He notes that it may be appropriate to monitor the keystrokes of data-entry workers to measure their performance in specific period of time

Computerized Monitoring: Some Important Distinctions

ITMT 430

◆ Weckert also notes that it may not be appropriate to monitor email in cases where client confidentially is expected

  ▪ For example,, a therapist employed in a health organization may receive highly sensitive and personal e-mail from one of her client's regarding the client's mental state or physical health

Rationales Used to Support Computerized Monitoring

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◆ Those who support computerized monitoring in the workplace tend to believe that it:

- improves workplace productivity
- improves corporate profits
- guards against industrial espionage
- reduces employee theft

Rationales Used to Oppose Computerized Monitoring

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◆ Those who oppose computerized monitoring in the workplace tend to believe that it:

- increases employee stress
- invades employee privacy
- reduces employee autonomy
- undermines employee trust

International Dimensions of Computerized Monitoring in the Workplace

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◆ Do we now need international agreements for employee-monitoring policies (involving information technology) because of the global workforce?

◆ Stephen Coleman (2005) notes that an employees' privacy could be violated by software-monitoring programs that reside on a computer located in a country different from the one in which the person is physically working

International Dimensions of Computerized Monitoring in the Workplace

◆ Coleman also suggests that an International Bill of Human Rights should be adopted to address global aspects of employee monitoring

◆ Actually there already is an International Bill of Human Rights under the auspices of the United Nations; it includes the *Universal Declaration of Human Rights*, the *International Covenant on Economic, Social and Cultural Rights*, and the *International Covenant on Civil and Political Rights*

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UN Universal Declaration of Human Rights

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- ◆ "**Article 12**
    - ▪ No one shall be subjected to arbitrary interference with his privacy, family, home or correspondence, nor to attacks upon his honour and reputation. Everyone has the right to the protection of the law against such interference or attacks."

- ◆ "**Article 19**
    - ▪ Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers."

UN International Covenant on Civil and Political Rights

ITMT 430

◆ **"Article 17**
  - No one shall be subjected to arbitrary or unlawful interference with his privacy, family, home or correspondence, nor to unlawful attacks on his honour and reputation.
  - Everyone has the right to the protection of the law against such interference or attacks."

◆ **"Article 19**
  - Everyone shall have the right to hold opinions without interference.
  - Everyone shall have the right to freedom of expression; this right shall include freedom to seek, receive and impart information and ideas of all kinds, regardless of frontiers, either orally, in writing or in print, in the form of art, or through any other media of his choice."

The End…

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◆Questions?