

SOCIAL IMPACT

CSE 4201: Ethical Issues and Professional Practice in Computing

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Social Impact

- ▶ The impacts that cybertechnology has had so far for a wide range of issues that cut across three broad (social) categories:
 - 1) *sociodemographic groups* (affecting social/economic class, race, and gender),
 - 2) *social and political institutions* (such as education and government),
 - 3) *social sectors* (including the workplace).

1. Sociodemographic Groups

- ▶ The *sociodemographic groups* that have been impacted by cybertechnology include:
 - social/economic class (e.g., low-income groups),
 - race (i.e., racial and ethnic minority populations),
 - gender (women),
 - disabled populations.
- ▶ We begin by examining disparities affecting socio-economic groups vis-à-vis cybertechnology - viz., the *digital divide*.

What Is The Digital Divide?

- ▶ The phrase “the digital divide,” coined in the 1990s, is a new label for an old concept involving information “haves” and “have-nots” (Compaine, 2001).
- ▶ *The digital divide* is now often used to describe the disparity between those who have access to Internet technology and those who do not.
- ▶ 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 cybertechnology,
 - b) the knowledge and ability to use that technology.

Digital Divide (Continued)

- ▶ Kenneth Himma and Maria Bottis (2014) believe that this “divide” or gap is better understood as a “series of gaps” affecting the technological haves and have-nots, which includes gaps (or divisions) between those have and do not have:
 - digital devices and Internet access,
 - the knowledge and ability to use digital tools, and thus enjoy their benefits.
- ▶ Along similar lines, Martin Ryder (2015) claims that the digital divide reflects the significant gap between those who can and those who cannot “effectively benefit” from cybertechnology.

Digital Divide (Continued)

- ▶ Discussions about *the* digital divide might suggest that there is one overall divide—that is, a single divide as opposed to many “divides,” or divisions.
- ▶ There appear to be *multiple divisions* involving access to cybertechnology.
- ▶ O’Hara and Stevens (2006) describe three kinds of “divides,” which involve divisions between:
 - rich and poor people,
 - rich and poor regions,
 - rich and poor nations.

Digital Divide (Continued)

- ▶ We examine the digital divide as it exists at two distinct levels:
 - 1) a “global digital divide” *between developed and developing nations.*
 - 2) a divide between *groups within Guyana*, based on factors such as **Region, Income and Education.**

The Global Digital Divide

- ▶ In 2000, it was estimated that 429 million people (approximately 6% of the world's population) were online globally.
- 68% of those online in 2000 lived in North America and Europe.
- Two billion people in the world didn't even have electricity, and in developing countries, there were roughly 69 phones for every 1000 people (*2000 Human Development Report*).

Some Statistics from *Internet Live* (www.InternetLiveStats.com)

- ▶ Internet Users in Guyana (2016*): **305,007**
 - % (penetration) of Guyana Population: **39.6**
Total Population : **770,610**
 - Share of World Internet Users: **0 %**
 - Internet Users in the World: **3,424,971,237**
- ▶ * estimate for July 1, 2016
- ▶ ** **Internet User** = individual who can access the Internet at home, via any device type and connection.

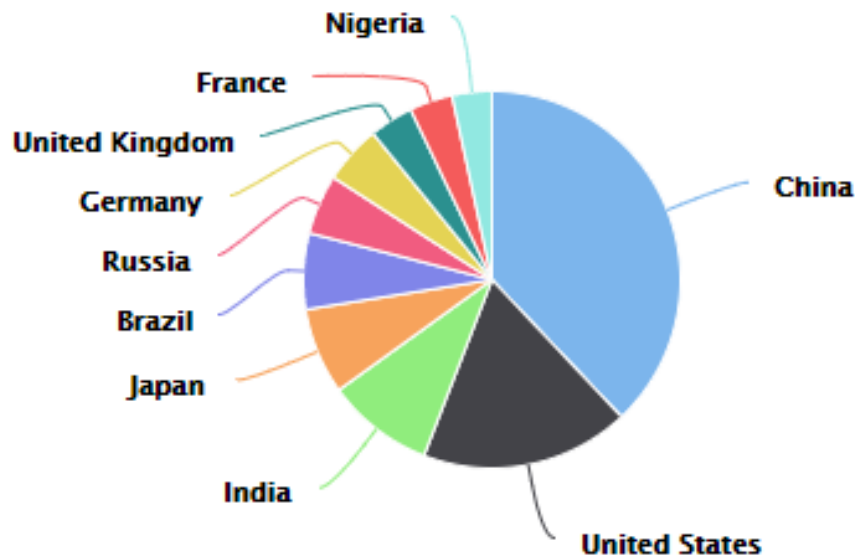
Country comparison for Guyana

Top 10 countries in the world

Guyana is **#143** in the world.

Internet users

Top 10 countries in the world



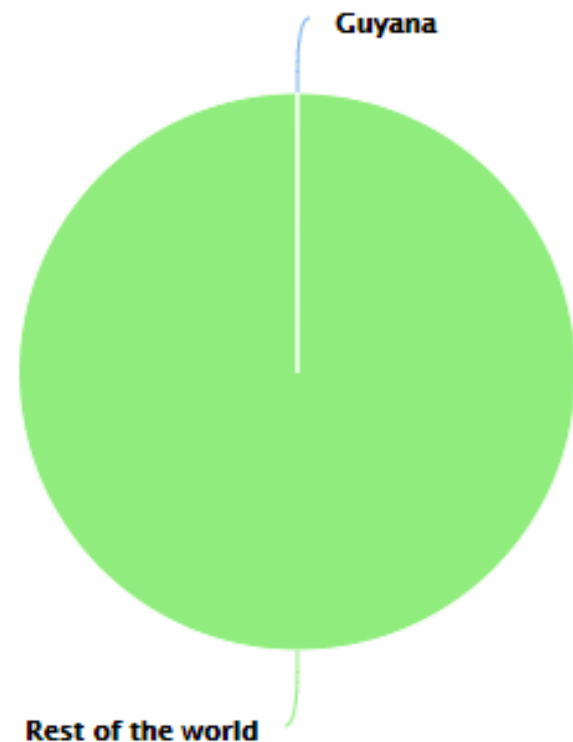
Source: Worldbank

World share for Guyana

Guyana has a world share of **0.0%**.

Internet users

World share for Guyana



Source: Worldbank

Some Statistics Noting Growth Between 2005 and 2011)

- ▶ In 2011 (*World Stats: Usage and Population Studies*), it was estimated that there were slightly more than two billion Internet users.
- ▶ But the despite this increase, the disparity in the percentage of users in developed and developing countries was still significant.
- In India, for example, the penetration rate for Internet users in 2011 was 8.4%, while in the United Kingdom it was 82% that year.

Statistical Data (Continued)

- ▶ The disparity seems especially apparent when viewed from the perspective of continents or world regions.
- For example, in Africa (which includes approximately 15% of the world's population) the Internet penetration rate was (as of 2011) 11.4%, whereas in North America, the Internet penetration rate was 78.3% that year.
- ▶ However, the Internet usage *growth* in Africa between 2000 and 2011 was 2,527.4%.
- Wresch (2009) notes that in a 33-month period during those years there was a 60% growth in the number of African Web sites.

Some Statistical Data (as of 2014)

- ▶ As of 2014 (*World Stats: Usage and Population Studies*), the disparity between the percentage of Internet users in developed and developing countries continues to be significant.
- In India, the penetration rate for Internet users (June 2014) was 15.8% (up from 8.9% in 2011), while in the United Kingdom it was 89.8% (up from 82% in 2011).
- On the continent of Africa (which includes approximately 15% of the world's population) the Internet penetration rate (June 2014) was 26.5% (up from 11.4% in 2011), whereas in North America, the Internet penetration rate is 87.7% (up 78.3% in 2011).

Statistical Data (Continued)

- ▶ Initially, one might be encouraged by some reports (from the 2014 statistics) describing growth in Internet usage at the global level, especially in Africa.
- ▶ Yet, despite the progress that has been 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.
- ▶ Others worry about the divides that continue to exist *within* nations.

The Digital Divide Within Nations

- ▶ Surprisingly, perhaps, there are still significant discrepancies involving access to cybertechnology within developed nations.
- ▶ O'Hara and Stevens (2006) point out a discrepancy in the UK.
 - For example, they note that in 2004, approximately one half of all the households were online, while only 3% of the poorest households were included in this number.

The Digital Divide Within Nations

- ▶ There are also significant disparities within some developing nations as well.
 - In India, for example, the divide appears to be exacerbated for two reasons:
 - 1) a growing segment of the population who are fluent in English and who have the technical literacy required to be able to work in many of the skilled jobs outsourced there are doing very well.
 - 2) those on the other side of the divide - the majority of the population - who have a low level of literacy and little or no access cyberterchnology, are not doing very well.

The Digital Divide in Guyana

- ▶ In Guyana, discussions about the digital divide have focused on factors such as:
 - Rich & Poor Regions - Coastal vs. Hinterland, Poor, Remote Communities,
 - Access to Income earning opportunities
 - Access to the Internet and ICTs.
 - Access to Health
 - Access to Education
 - Access to Government Services

Human capital development and the Transformation of Guyana through the use of ICT's

- ▶ UN Sustainable Development Goal: Target 9c:
“Significantly increase access to information and communications technology, and strive to provide universal and affordable access to the Internet in Least Developed Countries by 2020.”
- ▶ This vision outlined in Guyana's E-Government's mandate includes the need to bridge the digital divide that exists between the coast and our hinterland, poor and remote communities which is based purely on accessibility to the internet or the lack thereof.
- ▶ The Goal is to create a society in which information is equitably distributed, readily available and easily accessible to all.
- ▶ The objective of the vision is the creation of an information-based society, i.e. one that utilizes ICT's for the development of the economy in Education, Health, Agriculture and Business.
 - ▶ <https://mopt.gov.gy/speeches/human-capital-development-and-the-transformation-of-guyana-through-the-use-of-icts/>

The Digital Divide in Guyana - Region

- ▶ Today, poverty continues to linger in both urban and rural areas, particularly in the hinterland, our rural interior. The Hinterland regions of Guyana comprise about 2/3 (67.6 percent) of the landmass of Guyana, accommodating only 10.9% (approx.) of our total population.
- ▶ Because of the wide spread of homes and businesses across the sprawling interior regions, it is difficult for government and other services to reach the poorest. Cost and other barriers affect those residents' ready access to vital services available in urban and rural areas.

The Digital Divide in Guyana - Education

- ▶ E-learning, online courses, smart classrooms video conferencing should all allow Guyanese students to access the same quality of learning material online no matter where they are.
- ▶ The objective is to facilitate the students at the St. Ignatius High School in Lethem to connect in real time with a Biology class at Bishops High School.
- ▶ Provided connectivity and Internet access to over 250 educational institutions for teaching, learning, planning and for administration.
- ▶ Distribution of laptops to almost every Guyanese teacher, and the creation of a national e-Library, were also among the interventions we have made to bridge the gaps in quality and educational opportunities that exist between the coast and hinterland.

The Digital Divide in Guyana - Health

- ▶ The transportation of health information and specialized services online.
- ▶ This is critical especially given the challenges and costs associated with transporting patients and medical personnel between the interior and the coast (where most public health resources are currently concentrated).
- ▶ The objective is to have patients in rural health centres or hospitals being able to interact directly with a medical professional in the city ... online, of course, in the company of their resident Medic, nurse or doctor.

The Digital Divide in Guyana - Access to Information (Document Conversion)

- ▶ To enhance access to information in a more timely manner.
- ▶ Project to convert records from hospitals, the police, fire service, military, large public companies, the archives and national libraries to computers.
- ▶ This will ultimately save time, money and lives, especially when health workers are able to utilize the many opportunities abroad to upgrade their skills through online courses and research.
- ▶ Further, the adoption of ICTs in the public health sector would strengthen Guyana's capacity to identify and monitor the spread of diseases through the early warning system, reduce risk and manage national health risks.

The Digital Divide in Guyana - Building Human Capacity

- ▶ The objective is to train people in Communities to access and make full use of ICTs and the e-services.
- ▶ These are the areas in which the jobs of the future lie - the Government see the need to prepare citizens of the future for a range of employment opportunities in this sector.
- ▶ Training of persons in communities via ICT Hubs
- ▶ Encouraging STEM development via Robotics Camp etc
- ▶ Encouraging youths to take up a career in ICT Via Hackaton & Code Sprint - Both competitions produced dynamic apps such as the Farmers Market Exchange app which connects farmers with potential markets, live and in real time. We're looking forward to the launch of the finished product and the increase in agri business.

The Digital Divide in Guyana - GTT

- ▶ The Guyana Telephone and Telegraph Company (GTT), over the next two years plans to invest US\$30M to bridge the digital divide.
- ▶ one of the pillars lies in provision of high speed Internet to homes and businesses.
- ▶ prices for such services are competitive and more affordable when compared to other competitors.
- ▶ <https://guyanachronicle.com/2017/02/05/us-30m-to-bridge-digital-divide>

IMMEDIATE CHALLENGES

- ▶ Limited access to electricity
- ▶ Restricted access to basic public services
- ▶ Negligible access to education and health resources
- ▶ Lack of resident ICT-related capacities

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 automobiles, and that many of us fall on the “wrong side” of the “Mercedez-Benz Divide.”

The Digital Divide as an Ethical Issue (Continued)

- ▶ Is the divide affecting unequal access to cybertechnology similar to the “Mercedes-Benz Divide”?
- ▶ Or, is it closer to divisions involving access to vital human resources such as food and healthcare?
- ▶ 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 the “just distribution” of primary goods and resources in populations.

Distributive Justice

- ▶ What, exactly, do we mean by “distributive justice” in the context of cybertechnology?
- ▶ According to van den Hoven and 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 Rawls’ theory of justice and “primary social goods.”

Distributive Justice and Rawls

- ▶ In his classic work, *A Theory of Justice*, John 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

- ▶ Moss (2002) argues that people in developing countries who do not have access to cybertechnology are unfairly disadvantaged because:
 - i. they are denied access to knowledge;
 - ii. they are unable to participate fully in democratic decision making processes;
 - iii. their prospects for economic growth are hindered.

Bridging the Digital Divide (Continued)

- ▶ 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.”

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

- ▶ 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 (see Chapter 2).

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

- ▶ Bottis and Himma (2008) note that some important points of clarification are needed to make the case that “affluent nations” have a moral obligation to 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.”
- ▶ Bottis and Himma believe that 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.

3. Social Sectors: The Workplace Employment and Work

- ▶ We examine two different kinds of concerns affecting the impact of cybertechnology on employment and work:
 1. the *quantity* of jobs resulting from the use of cybertechnology;
 2. the *quality* of work-life for employees in the digital era.

Cybertechnology, the Quantity of Jobs and the Transformation of Work

- ▶ Thus far, it is not clear whether cybertechnology has either created or eliminated more jobs.
- ▶ It is clear, however, that cybertechnology has *transformed* (the nature of) work in the digital era.
- ▶ Those arguing that cybertechnology has reduced jobs point to the number of factory and assembly jobs that have been automated (and thus eliminated).
- ▶ Those claiming that cybertechnology 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

- ▶ *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).
- ▶ “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.”

Robotics (and Some Implications for Job Displacement)

- ▶ Developments in the field of *robotics* have also raised social concerns affecting job displacement.
- ▶ *Robots* have already replaced or displaced many factory and “blue collar” workers.
- ▶ Consider that some robots have been programmed to perform tasks that are:
 - a) routine and mundane for humans,
 - b) considered hazardous to humans.

Robotics (Continued)

- ▶ Patrick Lin (2012) notes that robots (in work-related contexts) are typically tasked to perform the “three Ds” — i.e., jobs that humans consider “dull, dirty, and dangerous.”
- ▶ Although robots were once fairly unsophisticated, contemporary robotic systems are now able to perform a wide range of tasks in the workplace.
- ▶ Some ethical aspects of robots and robotic systems are examined in detail in Chapter 12.

Expert Systems (and Some Implications for Job Displacement)

- ▶ While (physical) robots have eliminated many blue-collar jobs, sophisticated programs called *expert systems* increasingly threaten many professional jobs.
- ▶ An expert system (ES) is a problem-solving computer program that is “expert” at performing one particular task.
- ▶ ESs use “inference engines” to capture the decision-making strategies of experts (usually professionals).
 - They execute instructions that correspond to a set of rules an expert would use in performing a professional task.
- ▶ “Knowledge engineer” ask human experts in a given field a series of questions to extract the critical rules (used by professionals in their field of work) and then they design programs based on the responses to those questions.

Expert Systems (Continued)

- ▶ Initially, expert systems were designed to perform jobs in chemical engineering and geology, both of which required the professional expertise of highly educated persons and were also generally considered too hazardous for humans.
- ▶ More recently, however, ESs have been developed for use in professional fields such as law, education, and finance.
- ▶ ES programs have replaced some highly-skilled professional workers in a number of areas or fields.
- Examine the end-of-chapter scenario by Forester and Morrison (in the textbook), which raises some ethical questions about designing an “expert administrator” who may need to “lie” or to mislead people in order to be an *expert at its task*.

Remote Work

- ▶ One way that cybertechnology has transformed work for many employees is by making it possible for them to work “remotely” – i.e., outside the traditional workplace.
- ▶ Even though remote work is a relatively recent practice, it has already raised some social and ethical questions.
- ▶ One question has to do with whether all employees who perform remote work benefit from it equally.
 - For example, are white-collar employees affected in the same way as employees who are less-educated and less-skilled?
- ▶ It is one thing to be a white-collar professional with an option to work at home at your discretion and convenience, but it is very different for some clerical, or “pink collar,” workers who may be required to work remotely out of their homes.

Remote Work (Continued)

- ▶ Some professional men and women may *choose* to work at home because of child-care considerations or because they wish to avoid a long and tedious daily commute.
- ▶ However, other employees may not have the same options, especially those in lower-skilled jobs, because their employers may require them to work at home.
- ▶ In some case, people required to work remotely may not have the same opportunities for promotions and advancements as their (more visible) counterparts who have the option of working in a traditional workplace setting.
- ▶ So, employees in some situations may be disadvantaged because of employer-specific, remote-work policies.

Job Outsourcing

- ▶ Initially, the *outsourcing* of jobs mainly affected employees in manufacturing-related industries.
- ▶ Outsourcing now affects many highly-skilled “white collar” jobs as well, including some high-tech jobs.
 - For example, some programming jobs traditionally held by employees in American companies are now outsourced to companies in India and China.
 - Ironically, the jobs of programmers, whose skills were essential to make (the current practice of) remote work a reality, are now being outsourced to countries where programmers earn less money.

Globalization

- ▶ In addition to, and often in connection with, outsourcing and the loss of jobs, the economies of some nations have also been severely impacted by *globalization*.
- ▶ Monahan (2005) defines globalization as
...the blurring of boundaries previously held as stable and fixed...between local/global, public/private [and] nation/world.
- ▶ Discussions of globalization tend to focus on concerns affecting:
 - labor outsourcing,
 - international trade agreements,
 - immigration,
 - cultural homogenization.

Globalization (Continued)

- ▶ Our concern is mainly with the economic aspects of globalization, particularly as they impact cybertechnology and the workplace.
- ▶ Consider that trade agreements have made possible a new global economy, encouraging:
 - greater competition between nations,
 - greater efficiency for businesses.
- ▶ It is unclear whether these trade agreements have economically benefited some countries.

The *Quality* of Work-life

- ▶ 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

- ▶ 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 (Continued)

- ▶ An increasing number of these 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

- ▶ Kizza and Ssanyu (2005) describe some factors that have contributed to the recent expansion and growth of employee monitoring, two of which are the:
 - 1) plummeting prices of both software and hardware,
 - 2) miniaturization of monitoring products.
- ▶ The lower cost of software and hardware has made monitoring tools available to many employers who, in the past, might not have been able to afford them.
- ▶ The miniaturization of monitoring tools has made it much easier to conceal them from employees.

The Expansion of Workplace Surveillance (Continued)

- ▶ 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 (Continued)

- ▶ 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 and length of breaks an employee takes.

Workplace Surveillance and Monitoring of Electronic Devices

- ▶ Examine Scenario 10-2 (the *Ontario v Quon* case) in the textbook, which describes some controversies involving the 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?
- ▶ 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

- ▶ 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 Distinctions (Continued)

- ▶ 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 Distinctions (Continued)

- ▶ 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.
- ▶ Weckert also notes that it may not be appropriate to monitor email in cases where client confidentiality 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

- ▶ 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

- ▶ 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

- ▶ Do we now need international agreements for employee-monitoring policies (involving cybertechnology) because of the global workforce?
- ▶ 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.
- ▶ Coleman also suggests that an International Bill of Human Rights should be adopted to address global aspects of the employee monitoring.