Course Code	:	**DCIT 65**
Course Title	:	**Social and Professional Issues**
Course Description	:	The course argues about the pros and cons of the design and implementation of computing solutions in various organizations.

Lecture 1

Social Context of Computing

Learning Objectives:

After the completion of the chapter, the students will be able to:

- explain the impact of the digital divide;
- discuss the social context of a particular software / hardware implementation;
- describe the positive and negative ways in which computing alters the modes of interaction among people;
- explain how income, geography, race and culture influence access to information technology and technology in general; and
- analyze the role and risks of computing in the implementation of public policy and government.

Introduction

In the last 70 years or so, we have witnessed an invasion of computers and computer-related equipment in workplaces, homes, and schools. The advent of the Internet, wireless communication, and mobile computer technology has considerably expanded this invasion into planes, trains, and automobiles. The widespread use of computers and computer technology in its present form has also resulted in a shift in computer usage. The computer started as a utilitarian tool but has now also been embraced as a social tool. Probably due to the popularity of the Internet, both young and old have found solace in computing devices everywhere. Playing this double role as a utility and an entertainment tool, the computer has become an integral part of our social fabric.

However, in the meantime, two worlds have been created for humanity: the unreal world of entertainment and a real computer technology-driven world, which augments our familiar environment and makes our daily activities easier and more enjoyable. This in turn has led to an influx of computer technology into the workplace, schools, and the home. Indeed, the home has turned into a hub of technology. No one knows,

as yet, the social, psychological, and intellectual implications that may result from this. Predictions abound that this will enhance our intelligence and improve our performance at whatever we do. This belief alone has been a driving force for the computerization of schools and homes, with parents hoping to produce young geniuses.

These beliefs about the value of technology, whether supported by scientific research or not, are not new. Ever since the beginning of the industrial age when technology started entering the workplace and homes, the aim has been to utilize it and help make us wiser and more productive. It is, therefore, no wonder that as technology has developed, progress and fundamental changes have been taking place almost daily. Our focus in this chapter is on both the social and ethical effects of computer technology on people, whether we are at home, school, or work. We will focus on the social and economic dimensions of computing as a result of the “digital divide,” the workplace, workplace monitoring of employees, and the well-being of employees.

The Digital Divide

The technological inequalities among people in one country and between countries, commonly known as the digital divide. The digital divide debate has been raging, centered on a number of key critical issues including:

- Whether there is such a thing as a digital divide
- Indicators that should be used to measure such a divide if it exists and
- The best ways to close such a divide.

Much of the debate is the result of a lack of understanding about the digital divide—its origins, inputs, and responses to inputs. In general, in a broader sense, the study of the digital divide involves the study of the impact of the digital divide indicators. These indicators concern communication technologies such as radio, television, the press, fixed and cellular telephones, fax machines, computers, and connectivity to the Internet, and participation in cyber activities for all members of a society. However, in its most basic definition, it is a discrepancy in access to information technology. What causes it? Why does it exist? Answers to these two questions can take up to two large books. There are a multitude of causes and enablers, and as long as these exist in any society, the digital divide will exist. Study after study, since the inception of the concept, have pointed to social, economic, and geographic factors as influencing the digital divide. More specifically, the following are the enablers of the digital divide: access, relevant technology, humanware (human capacity), infrastructure, and enabling

environment. These enablers fuel the following causes of the digital divide: geography, age, education, income, race, and ethnicity.

It is interesting to see the forecasted increase in smartphone users in the Philippines between 2024 and 2028 as shown in Figure 1.1.

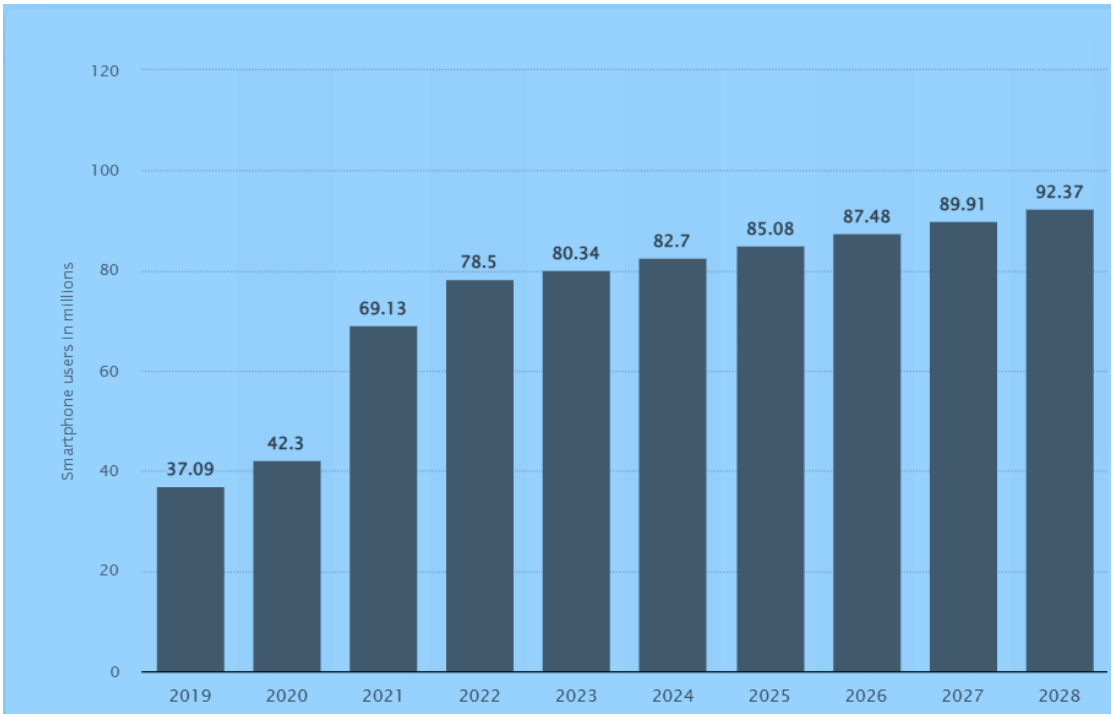

Figure 1.1 Number of smartphone users in the Philippines from 2019 to 2028

The forecast suggests a continuous rise in the number of smartphone users in the Philippines from 2024 to 2028, with a total increase of 12 million users, equivalent to a growth rate of approximately 14.94 percent. In 2028, it is projected that the smartphone user base will reach a new peak at 92.37 million users. Notably, this trend reflects the consistent growth of smartphone usage in the country in recent years.

Access

Access is a crucial component in the digital divide. It involves obstacles that exist even if all the other remaining indicators are in place. Such obstacles may include, but are not limited to, costs involved in acquiring the technologies, availability of free or low-cost facilities in the neighborhood, the ability to travel to places where there are low-cost access points such as libraries and community centers, and having the capacity needed to utilize the technologies. These obstacles can broadly be grouped into five categories: geography, income, ethnicity, age, and education.

Geography

There is a big digital divide between the rich industrialized countries and the poor, less industrialized countries. The poor, developing countries, geographically are more deprived of the access to information although mobile technology has improved this situation a lot in the last few years.

Focusing on information communication technology (ICT), the main driver among the indicators of the digital divide, the picture, though improving some, remains the same, and this is depicted in mobile cellular, mobile broadband, fixed broadband, and Internet technology.

Digital inclusion describes the effort to ensure that every individual and community has access to Information Communication Technology (ICT), along with the skills to make use of it. It is also defined as “equitable, meaningful, and safe access to use, lead, and design of digital technologies, services, and associated opportunities for everyone, everywhere”.

Income

According to recent studies, household income is the greatest predictor of Internet and other ICT technologies’ use. Reports showed that the analysis of several surveys revealed significant key differences between those who live in household making higher income to those in lower income households. The key findings featured in the report presented the three information communication technologies, namely broadband at home, Internet use and mobile phones ownership.

Ethnicity

One’s ethnicity has a great influence on ICT access. Although there has been no comprehensive study of global ICT access based on ethnicity and race, there have been limited but revealing national studies.

There have been interesting changes in the issue of ethnicity and access to ICT technologies. These dramatic changes have been brought about by the rapid changes in modern communication technologies, more specifically Internet-able mobile communication technologies. Today, mobile technology has become an equalizer of sorts, in some aspects, as it brings computers and the ability to access Internet and the Web.

Age

There is a myth that young people use computers and the Internet far more than any other age group. There is also conventional wisdom that young people under age 18 do more surfing of the Internet than any other age group.

On wireless communication, the picture becomes more interesting. Smith reports that nine in ten 18–29-year-olds own a cell phone, and these young cell owners are significantly more likely than those in other age groups to engage in all of the mobile data applications as follows:

- there were 85.16 million internet users in the Philippines at the start of 2023, when internet penetration stood at 73.1%.
- The Philippines was home to 84.45 million social media users in January 2023, equating to 72.5 percent of the total population.
- Filipinos have the highest average screen time spent on phones, and rank consistently high for average screen times on computers, social media and gaming.
- Filipinos spend nearly a third of their day (32.53%) on their phones
- younger people are more likely than older adults to own a phone in the Philippines (41%)

There is growing evidence that this love for mobile devices is also growing fast among the 30–49-year-olds.

Education

The profound impact of the educational digital divide on students' overall development, safety, and welfare, as well as their potential for present and future success, has led numerous community and business leaders to consider addressing this issue at a local level. While there are various technological solutions that can have a positive influence on the educational digital divide, the following three stand out as particularly noteworthy.

Universal Connectivity/Enhancing Connectivity: At present, the most significant obstacle affecting educational access is the issue of connectivity. Almost all policy recommendations aimed at bridging the digital divide prioritize the enhancement of connectivity as the foremost concern. Unequal access to electronic devices and reliable, high-speed internet connections has a detrimental impact on educational opportunity, academic achievement, and equity disparities. Many argue that high-speed broadband should now be considered a fundamental

community infrastructure, given its critical importance in virtually all aspects of modern life. Initiatives and programs designed to rectify disparities in internet access, such as universal community-based Wi-Fi and those facilitated through the Wireless Reach Initiative, have the potential to enrich educational opportunities and ensure that all students are well-prepared for success.

Adaptable Educational Platforms: In response to the pandemic, virtually all educational institutions adopted digital platforms for content delivery, student and parent communication, and instructional purposes. However, like any technological solution, the attributes and advantages of these platforms can differ, with some offering greater flexibility than others. There are alternatives that offer offline access to content or enable the downloading and storage of educational materials.

Engaging with Families on an Individual Basis: In areas where achieving universal Wi-Fi coverage is not feasible, communities might explore the possibility of enhancing public access through venues like libraries and community centers. Additionally, communities can collaborate with various businesses and organizations to help individuals overcome technology access challenges, such as through partnerships with organizations like the Closing The Gap Foundation. By identifying the required resources, the community can collectively address these needs and reduce the educational digital divide.

Technology

It is often said that necessity drives innovation, and indeed, all technologies that have arisen and flourished have been created to address societal needs. With the introduction of new technology, it consistently mirrors the core requirements and desires of a population. Presently, technology and societies are intricately linked, forming a cyclical relationship where each profoundly influences the other. As human beings evolve and as their needs and desires evolve over time, advanced and contemporary technology steps in to fulfill these evolving demands. Technology is shaping our contemporary society. Here are several ways in which it is enhancing our everyday existence:

Enhancing Business Efficiency: The business landscape is undergoing a remarkable surge in exponential technological advancements. In the contemporary market, a lot of companies exist to innovate, adapt, and make significant strides through technology. The adoption of business analytics has proven to be advantageous in elevating the customer experience. These technology-driven

business tools have propelled various facets of business to new heights. The use of personalized messaging and analysis of user behavior has further enabled businesses to establish their successful presence in the market.

Enhanced Communication Speed: When we consider the undeniable impact of technology on our lives, one remarkable change is the transformation of how we interact with one another. This transformation has given rise to numerous electronic communication methods, including smartphone communication and social media. In today's society, we have advanced to a stage where fast and seamless communication has become readily accessible. Speed stands out as a significant enhancement brought about by technology, making instant and effortless communication achievable from the convenience of our homes.

Advanced Lifestyle: Throughout history, societies have undergone a transformation under the influence of technology. Technology has been a cornerstone in shaping human behavior and actions in the world. The constant evolution of technology is a given, with new breakthroughs continuously emerging and significantly impacting our way of life. Thanks to technology, our lives have undergone a radical shift compared to previous decades. The influence of technology is omnipresent, whether in transportation, agriculture, education, and more. Moreover, the Internet of Things (IoT) has ushered in a new era of convenience. Through smart homes and advanced electronic devices facilitated by IoT, our daily routines have been greatly enhanced. These innovations have made various aspects of life more convenient.

Information availability: The impact of technology on how we exchange and retrieve information is substantial. In the present day, information is literally at our fingertips, and we regularly seek answers and collect data from the internet. The key to making technology readily accessible lies in one's ability to navigate and filter for authenticity and relevance. When discussing the benefits of technology, one could argue that information accessibility is among the most noteworthy advantages.

While technology has undeniably enhanced our quality of life in numerous respects, it has also introduced an array of fresh challenges and risks that demand attention. Our lives are presently more intertwined than ever, but this interconnectedness can come at the expense of our privacy and security. Cybersecurity threats have become commonplace and can lead to substantial disruptions, and concerns like cyberstalking, sexting, and cyberbullying now require responsible vigilance from both adults and

children. Technology has wrought innumerable changes in our lives, influencing how we interact and even how we consume media. As technology progresses, its impact on our daily existence continues to expand.

Humanware (Human Capacity)

The availability and easy access to ICT do not always solve the digital divide problem. As Rodriguez and Wilson pointed out, it is only a partial solution to a complex problem. Even if we were to provide everyone on the globe with first-class ICT equipment, the reality would remain that only a few would be able to maintain and gainfully use the provided technologies. This is likely to remain the case until there is a corresponding degree of technical capacity and knowledge acquired by the people intended to use the technologies so that they can maintain the equipment and derive value-laden outputs. The first problem is the lack of humanware in developing counties to maintain the equipment. There is a shortage of teachers, technicians, and institutes to train them. The next challenge is to ensure that people can gainfully use ICT to add value to local inputs. People will take ICT seriously when it meets and serves their own local needs. Human capacity development is complex usually consisting of many parts including:

- Creating awareness of the potential for ICT to meet one's needs
- Creating, developing, and strengthening capacity to use information and ICT effectively, using local inputs
- Building capacity to produce and package information so that it adds value to local inputs
- Ensuring ongoing technical capacity development and developing a format for knowledge and information sharing
- Preventing the local capacity from being drained to other, usually developed countries.

The challenge, therefore, in tackling human capacity development is to deal with each of these issues so that the locals using ICT may find meaningful answers to their local problems. ICT capacity development should take into account equity, fairness, and cultural and other contextual factors at the local levels.

Infrastructure

As noted by many, the digital divide infrastructure is related to access in many ways. They both present obstacles to gaining access to ICT. For us, infrastructure

will mean fixed communication structures. In those countries with good fixed communication structures like electricity, telephones, good roads, and airports, ICT development is a lot faster. Lack of such resources hinders the development of ICT. Those who have worked in developing countries can attest to the enormous difficulties in the logistics of reaching people located in remote rural areas with limited or no access to formal educational systems, health care, portable water, electricity, or jobs related to the new information economy. This highlights the necessity or lack of good fixed communication structures that are crucial to the development of ICT.

The availability of these resources helps to speed up the development of ICT structures like Internet cafes. ICT access enablers such as personal computers, personal assistants, Internet-enabled cellular phones, and other miniature Internet-enabled gizmos in developed countries and the urban areas of developing countries, together with civic centers in developed countries and telecenters in developing countries, have all been hailed in advancing global communication. But in order for them to work, there must be a basic communication infrastructure in place. So if digital communication is to be developed in the developing world, ICT-accessible points such as telecenters, civic centers, and Internet or cyber cafes must be opened up where there are none and expanded where there are a few.

Enabling Environments

As Rodriguez and Wilson noted, there are many countries with similar levels of per capita incomes and economic structures exhibiting widely varying ICT performances. There are no good explanations for this except for the existence, or lack thereof, of enabling environments. An ICT-enabling environment is an environment in which ICT can thrive. There are several things that can bring about such an environment, including politics, public policy, and management styles.

Politics

According to Rodriquez and Wilson, ICT thrives in a good political environment that ensures:

- A climate of democratic rights and civil liberties conducive to ICT adaptation
- Respect for the rule of law and security of property rights
- Investment in human capacity

- Low levels of government distortions.

Public Policy and Management Styles

Governments must put in place streamlined regulatory policies for the importation and licensing of ICT technologies. Laws must be enacted and enforced uniformly so that nongovernmental organizations (NGOs) and other organizations interested in investing in ICT economic activities do so with ease.

In many developing countries, there are currently ICT-related laws and policies on the books which are not enforced. Such policies must be updated where necessary and enforced strictly and fairly. New competitive policies such as the liberalization of the telecommunication and energy sectors must be developed, and the sectors must be staffed with competent managers with appropriate expertise. These ICT regulatory policies need to be efficient, predictable, and easy to understand. Licensing bodies need to be efficient and staffed with professionals. In addition, there must be government support for taxing policies. Finally, there must be transparency in government to create a moral bar for the rest of the country.

Obstacles to Overcoming the Digital Divide

Based on a number of studies and data, including that of Bankole et al. and that of Kim et al., indicating that digital inclusion is one of the agents of development, countries and policy makers are making every effort to expand the digital inclusion, thus degrease the digital divide within countries and across the globe. But minimizing the digital divide requires considerable efforts and a plan in addressing the following types of access:

- Physical access—which involves individuals being able to obtain access to computers, landlines, and networks in order to access the Internet
- Financial access—having the means to meet the costs of ICT devices, traffic, applications, technician and educator training, software, maintenance, and infrastructures
- Political access—creating the political environment that enables a faster growth of the Internet and other digital inclusion technologies
- Cultural access—availability of images and language to carry over the digital inclusion across different cultural lines.

ICT in the Workplace

The automation of the workplace has been the most vigorously pursued concept since the industrial age. Despite the original fear that workplace automation would mean the end to human work, except in a few areas, workplace automation has proceeded hand in hand with increases in employment numbers. This is, of course, not to deny that automation has caused some human displacements in the workplace. But overall numbers are steady, the introduction of computers into offices did not bring about any significant dismissal of personnel, nor did it result in a decline in the general level of employers. Among all the different technologies that have thus far entered the workplace, computer technology has entered at an astonishingly high rate of speed.

The Electronic Office

We can define an **electronic office** as a technology-augmented office with knowledgeable employees. The technology in the environment may include computers and computer-driven devices that help in interpersonal oral and electronic communication; distribution and receipt of correspondence; telecommunication devices with text-processing and storage capabilities to enable the office staff to design, develop, edit, and store material electronically; and other office support equipment to streamline decision-making tasks. The evolution of the electronic office began with industrialization but took giant steps beginning in the 1950s with rapid advances in computer technology and telecommunications. Since then, the workplace has been undergoing a rapid transformation of its own. Gone are notepads, typewriters, large cabinets filled with manila folders, the rotary telephone, and rotary fans. Computers have replaced most of the filing cabinets, the files, and typewriters. Electronic notepads, automatic answering systems, office intercoms, copiers, and fax machines have moved in. Living plants and air-conditioning have become standard. Increasingly, office job descriptions at all levels and in all professions are being transformed to incorporate computer and telecommunication skills.

Two factors have been and are still fueling the growth of the electronic office. The first is the *increasing productivity of office employees, both clerical and professionals, to counter the rising costs of office operations, which according to Olson and Lucas have been increasing faster than office employees' productivity*. The second is *the acquiring of technology necessary to handle the ever-increasing complexity and modernization of office communication and decision-making processes.*

Office on Wheels and Wings

As electronic gadgetry has been invading the office and the overall workplace, workers have been leaving the office in droves, a few of them replaced by the new technology, others transplanted by it, but many for the experience of working outside their original office confines.

The advent of laptop computers, tablets, cellular phones, and personal digital assistants (PDAs) have accelerated the mobility of the office. Busy executives, white-collar workers, and, this time around, blue-collar workers, especially those in the service industry, can be seen in airports, hotel lobbies, restaurants, and aboard airplanes and in trains, keying in data and putting in a day's work as they would have done previously in their offices.

Mail and package service company drivers are also keying in their locales and speed, transmitting the data to the company computers so a package can be continuously traced from the time of departure to within minutes of the estimated time of arrival. Many companies are embracing this new office on the go. Among the industries that have found the edge in this phenomenon is the home service industry, which is utilizing the new office technology to improve services and of course increase business. Others include delivery services, home repair, and heating and air-conditioning services to keep workers on location and in the office in constant contact.

The Virtual Workplace

With the latest developments in telecommunication and computer technology, the virtual workplace is home to increasing type of employees who work very briefly in their corporate workplaces, are mostly on the road, and often telecommute using personal or company-provided equipment. This breed of worker is rarely in a fixed workplace, but nevertheless he or she performs a full day's work even if at the beach.

According to Snizek, the most important element of the virtual workplace is the use of computers and other telecommunication devices to link up employees and the massive worldwide databases of vital information and other human resources. As computer and telecommunication technologies improve and the bandwidth and computer miniaturization increase, this will not only lead to more workers opting for the virtual workplace but will also increase vital information flow into the company and corporate offices, which may lead to companies gaining a higher level of vital data, employee expertise, and experience from colleagues around the globe. The

virtual workplace's increasing popularity is mainly due to recent changes in computer and telecommunication technology and organizational changes as a result of corporate downsizing and outsourcing. For example, in order for corporations to keep the same level of overall effectiveness and efficiency and even to surpass it sometimes with fewer employees, companies are increasingly encouraging virtual offices, and the trend is likely to continue.

There are other benefits of the virtual office in overhead savings and other costs. With virtual employees rarely in their offices, a number of other employees can share their office space and other office resources, thus saving millions in facilities and equipment costs. The company may no longer need to have a large workforce on a permanent full-time basis. Companies can now use a limited staff and seek out contract expertise on a case-by-case basis as the situation arises.

In addition to the transformation of traditional workers, the virtual office is also opening doors to a new group of workers such as the disabled, the homebound, and the elderly who have traditionally been left out of the workforce.

It is probably too early to talk about the long-term effects of the virtual office on both the employees and employer, but there are some difficulties already visible both in the employee and employer communities. Because most employee time is spent outside the physical office, employees rarely meet face-to-face, so there is a lack of collegiality and of community spirit. Also, since most employees, especially experts, are not full-time employees of the corporation, there is a lack of belonging that affects employees and eventually undercuts their loyalty and hence their effectiveness. A company built on a transient workforce lacks the moral force and legitimacy in the community in which its operations are based.

The Quiet Revolution: The Growth of Telecommuting

As workers have changed their work habits from working 40 h a week in the workplace environment to sharing those 40 h between being at the workplace and commuting to the workplace, the 9–5 time schedule for the majority of workers has started to crumble, with many moving their work locales outside of the normal confines of time and space. Studies show that the largest number of workers doing their work outside their primary place of work does it in their homes. According to the figures reported by Kraut, the percentage of home office workers or telecommuters in 1960 was 3%, but the numbers have been on the rise ever since. As technology grows, so will telecommuting. According to Calaveras Enterprise, in

“Telecommuting a Growing Trend,” telecommuting is a growing trend in the information age with 2016 figures of 45% workers holding a job that is compatible with at least part-time work from home. According to Chad Brooks of the Business News Daily, the vast majority of telecommuters work from home only on a limited basis. Among those who are currently telecommuting, 45% work from home less than five days a month, while just 24% telecommute more than 10 workdays a month. About 23% work from home one or two days a month, 22% do so between three and five days a month, and 24% telecommute more than 10 workdays a month. It is estimated that in year 2020, close to 30% of the workforce will be telecommuting. This is a significant rise and can be attributed to the growth in the information-related work. In fact, JALA International, an international group of consultants in telework, telecommuting, and applied futures research, projects that more that 60% of the workforce will be information related by 2020. The growth of telecommuting is also driven by advances in office technology and the plummeting of prices for computers and telecommunication devices, the diminishing sizes of communication devices, and the increase in speed and bandwidth of communication devices.

As office technology improves, a large number of workers outside the self-employed professions of artists, writers, and craftspeople are potentially able to work at home. The advances in technology are making many types of jobs that used to require a worker to stay in an office environment more mobile. This is being helped further by the shift in global economies from manufacturing based to information based.

Categories of Telecommuters

There are three categories of telecommuters. The *first category* of telecommuters consists of *workers who use their homes as an adjunct to their conventional office jobs*. These workers are usually in white-collar jobs in areas such as management, research, market studies, and education. They are highly motivated. For them, occasional work at home is a flexible alternative used most in cases of critical work that can best be done at home to avoid the office environment.

The *second category* of telecommuters consists of workers *who use their homes as the base for their businesses*. The majority of these are in telemarketing, small start-up companies, and human services such as child care and elderly care. Unlike the first category, these individuals are less

educated and less likely to use a fully equipped electronic home office. Others in this category are the dispatchers in the home service industry. They are more likely to use a telephone and a computer without much data transmission.

The *third category* of telecommuters consists of those who have f*ull-time jobs with large companies but prefer through their own initiative to work from home*. This category includes computer programmers, sales specialists, editors, writers, and those whose work depends on a high degree of creativity such as artists, musicians, and composers. This third category is a mixed bag of highly educated, independent, and specialized workers and those who are not so highly educated but very talented and skilled.

As computers and telecommunication technology become cheaper and people get more access to smaller more portable computers and other communication devices become more readily available, the home is becoming more and more a place of refuge for conventional office workers. Although it is not possible to predict the future direction of the home office, it is likely that if the technology that has caused the increase in the home office keeps on track, the number of telecommuters is likely to continue growing, with the majority of workers remaining in home offices for economic benefits and convenience.

Company Role in Telecommuting

To many, the home office is a revisit to the cottage industry of the fifteenth through eighteenth centuries in Europe: Raw materials were dropped off at the workers' cottages, and finished products later picked up for market. Ever since industrialization, factories and later companies have been using home workers. Thus, company experimentation with their employees telecommuting is not a new idea.

The home office has always been prompted by new advances in technology and by the need of businesses to become more productive with minimum expenditures. As the Internet and globalization open up new international competition and as new technologies make telecommuting more acceptable to employees, company-sponsored telecommuters will increase.

Although no study has yet reported big monetary benefits for companies from these experiments, some studies on other related issues have provided some results. For example, on the issue of remote supervision, classification of jobs

fit for telecommuting, and identifying individuals better suited for telecommuting, a study by Lucas provided some partial answers. On the issue of classification of work, the study found that work with possible measurable milestones is most suited for telecommuting. On the issue of identifying individuals most suited to telecommute, the study found that people who usually need less supervision at the office and those who do volunteer work are the most suited to telecommute. These conclusions are also influenced by the nature of the work, gender, age, and labor supply. The study also highlighted difficult issues such as the effect of telecommuting on the promotability of employees because visibility is key to promotion. There was also some light shed on the issue of pay. Telecommuters tend to be paid less because their pay is based on output, which makes output the real mechanism of monitoring telecommuters.

Effects and Benefits of Telecommuting

Whenever there is a change in the environment of workers, there is always bound to be some social, psychological, and financial effects on both employee and employer. If the effects are financial, they become benefits. However, if they are psychological, they become health issues; if they are social, they become organizational issues. In this section, we concentrate on social and financial issues.

An employer–employee arranged home office is supposed to reap benefits for both parties. Let us start by qualifying our discussion to include only those telecommuters who are company employed, have traditional offices at companies' premises, and through mutual arrangements with their companies have decided to work from their homes. This group truly exemplifies the benefits, if there are any, for both the employer and the employee. Because these workers have a choice of either staying at the office or working from home, they can work only from their homes if they experience a benefit, and the companies can only let them work from their homes if the companies expect a benefit from the arrangement. For those working at home with no choice but to work at home, like those in the majority in category 2, the benefits are already clear. Defining benefits for telecommuters is not easy because each participant in the arrangement perceives the benefits the way they would like them to be. For example, the company may see the benefit as savings on office space so that other workers can use the space, or as savings in office supplies, or a

reduction in the likelihood of employee risks while on company premises. The employee may see benefits as spending more quality time with their loved ones at home, or spending less time in traffic commuting to and from work, or the flexibility and independence in decision making concerning the work the employee has to do. The value of benefits from this arrangement depends on individual circumstances as discussed by Kraut and reported as follows:

1. *Gender* - Women have traditionally given care to children and the elderly, the two groups most homebound; women would therefore draw maximum benefits from telecommuting arrangements with their employees, if their primary objective for telecommuting is to take care of their families.
2. *Nature of work* — managerial, clerical, sales, or service: The nature and type of work one does also influences the kind of benefits one gets. For example, clerical work tends to be more supervision intensive than managerial and professional work. In these types of work where supervision is not as intensive, there is a high degree of latitude for one to make decisions. However, jobs that are supervision intensive are less likely to be moved into home environments. If such jobs are to be moved to a home environment, chances are that the company may not garner any benefits, but employees may benefit by getting more freedom and flexibility in the work routine and in decision making.
3. *Labor supply* - When there is a limited supply of one type of workers, companies try to find innovative ways of attracting and keeping workers in those limited-supply areas. For example, in 1981, IBM, anticipating a demand in programmers and engineers, started a telecommuting program to attract young talented programmers and engineers. Members of such groups usually garner great benefits with such an arrangement.
4. *Age* - Age may be a factor in home office productivity. For example, in sales, young people are more productive outside of offices than older workers. In management, older people are more productive in offices than outside offices. Women in their childbearing years are more productive when they telecommute than when they work in company offices. So using the age factor, both employer and employee can benefit from home offices.

The benefits of telecommuting for both employees and employers are summarized as follows:

- An individual benefits from telecommuting because he or she immediately eliminates the time, trouble, and expense of physically commuting to work. This gives the average person an extra hour per day, right off the top, to use for the thinking, writing, telephoning, planning, and reporting work that keeps the business organization moving forward.
- The benefits of telecommuting also translate directly and immediately into more discretionary time, less stress, and general health improvements.
- More autonomy in work decisions and having more control over time and more flexibility in job variations.
- Less commuting expenses on an individual.
- More quality time with family with less to no frustration at home.
- Employers benefit from the extra productivity that has been reported to be consistently at 10–15% in many studies in the last two decades.
- Employers also save on expenses through having fewer employees on company premises. Such savings come from the daily need for offices, desks and chairs, bathrooms, copy machines, parking spaces, heating and lighting, and all the rest.
- In addition, telecommuting helps the best and satisfied employees stay longer, thus saving on recruiting and training costs.
- The society benefits from telecommuting through benefits to the environment.

But the overall benefit to employers of home office workers is evaluated through measures like the productivity of the employee.

Telecommuting is not all positive, however. Among the issues that negatively affect the company image are employee morale and alienation. Because of the lack of professional contacts, employees' morale may suffer, and they may feel abandoned by the company. If this happens, productivity falls. Another negative impact is the public's perception of the company when they see an employee mowing the lawn at 3 p.m. on a workday.

Employee Social and Ethical Issues

Mentioning the phrase office automation is used to conjure up terrifying images of less control, helplessness, joblessness, and the stagnation of humanity. Within the

context of office automation, the concept implies the idea of massive layoffs because offices with intelligent machines may require fewer people. Besides the fear of layoffs, workplace automation has also been plagued with the issue of diskilling, meaning stripping an employee of job skills as a result of changes either in job content or procedures. Diskilling, according to Attewell et al., can either be intraoccupational, in which case the skill content of the job decreases over time, or entraoccupational, in which very few people gain the skills needed for the job, causing either low-paying jobs or layoffs. Driscoll expressed the fear of diskilling in a more sarcastic way by saying that the office of the future would “leave people in only two roles: bosses and garbage collectors.” But so far, these horrific fears of diskilling have not been realized, even with the heavy office automation of the last 10 years.

There have been some layoffs and diskilling of employees, but the numbers have been very small. Several factors have prevented this from happening; among them are the following:

- The willingness of employees to retrain and use the newly acquired technology. This, of course, has lead to the upgrading of skills in the workplace. In fact, according to Attewell et al., computerization has led to reskilling of employees rather than diskilling.
- The historical patterns show that more efficient production techniques lead to expanded operations and added growth, which leads to more hiring rather than firing of existing employees.
- In anticipation of automation, more employees are usually hired to cope with the new technology and to handle the expanded work capacity.

Employee Monitoring

In the last decade, most of the large industrialized economies have been shifting from a heavy manufacturing base to an information management base. Along with this shift has been stiff competition resulting from globalization. Competition comes from not only large economies but also upcoming developing countries. These developing economies with their cheap labor costs are making this competition more costly for a number of older, more established, and mature economies.

This shift in the economies and the stiff competition have resulted in a shift in management styles to bring more efficiency and quality in the established economies. This is not the first time such management styles have shifted. Styles in management

have been changing with shifts in economies since the dawn of the Industrial Revolution. In those early days, management followed a style now commonly known as Theory X, after Douglas McGregor. Theory X management, with all the trappings of the industrial era, was characterized by a top-down autocratic style of management in which the manager—literally from the top floor —commanded the activities of the factory workers on the factory floor with almost omniscient and demeaning power.

As economies grew bigger and employees became more elite, a new management style started to evolve that became known as Theory Y. Theory Y put more faith and empowerment in the hands of the employees. The style was hierarchical with the employee ranks broken down into small semi-independent units. Each unit was headed by a supervisor. The supervisors themselves formed another top-down hierarchy ending with the top management. Theory Y, or scientific management, as this management style is commonly known because of its hierarchical structure, gave more flexibility and partial decision-making powers to employees at different levels of the management hierarchy. The workers themselves were more removed from the top management, but at the same time, they were closer to management decisions and control from the smaller units. Scientific management has been in effect for years.

But with the recent shifts and globalization of world economies, scientific management has been slowly giving way to a new style in which management is trying to wrest back control of the work process away from the workers and slowly bring back the techniques of Theory X. Given the technological advances of recent years and the abundance of educated and highly skilled workers, though, it would be unwise for today's management to bring back these techniques. So, a new technique in the works is called "fear management." It is aimed at keeping worker in line, just like all other management styles, but with "voluntary" compliance by workers to company management policies and practices they would normally have questioned or challenged.

Unlike Theories X and Y, which achieved worker control through autocratic and supervisory unit means, fear management uses both worker surveillance and control as enforcement means. Fear is transmitted to workers through policies like "downsizing," "contingent work force," and "outsourcing." To workers, these policies spell disaster and fear of losing job security and being replaced by part-time, temporary, and contract workers. According to Nussbaum, temporary workers now make up one-third of the workforce, less than one-half are covered by any pension, and many have no health insurance.

Management is using a wide array of surveillance gadgets and techniques. These include, among others, employees taking polygraph tests if they are suspected of a breach of any kind. Drug testing is widely used by many companies and required by all government employees in some categories. Handwriting analysis, the honesty test, electronic monitoring, mind control, and many other techniques are also being used.

Workplace Privacy and Surveillance

The electronic office or workplace has provided management with a bonanza of new possibilities for monitoring employees in their drive to reduce ever-increasing workplace costs. The issue of employee monitoring is not new because of the advances in computer technology. Ever since the Industrial Revolution, workers have been monitored for performance evaluation because it has been used as the basis for pay and for decisions about employee advancement. Monitoring has also been employed to control employees and impose overall discipline in the workplace. But before the advent of surveillance gadgets, workplace monitoring was done through human eyes—the supervisors.

As workplace modernization picked up speed with advances in technology, the techniques and debate surrounding employee surveillance intensified. The battles were fought on two fronts: those who see monitoring as good management control tools with plausible reasons such as increased production, more accurate assessment of employee performance, greater organizational control over employees, immediate feedback on individual employees (which can lead to high motivation), and more flexibility in work location, and those who see surveillance as an outright transgression of employee privacy, causing problems such as stress, decreased job satisfaction, and an affront to human dignity. The replacement of the human eye with an electronic one, on guard 24 h a day, seven days a week, without taking a break, and easily concealed, really started the actual erosion of employee privacy.

Employers collect information from employees through two channels. The first is the *voluntary channel* in which employees surrender the information through forms, interviews, worker sessions, and worker get-togethers. The first work-related information collected from the employee by the prospective employer is collected from the job application, followed by more information surrendered by the prospective employee during the interviewing process. Most of the time, this information is given voluntarily because the person wants to get a job and of course employers need employees they can trust. After being hired, especially during the

first few days at the job, the new employee usually fills out myriad forms for an employee folder so the employer can pay for the new employee's benefits, taxes (part of them anyway), and salary.

The second channel is the *private information the employer gathers through surveillance*. The degree, rate, and method of surveillance depend on the employer and how much information is needed from the employee and the value of that information to the employer. The information collected is supposedly used solely for managerial decision making regarding employee work assignments, individual feedback, pay increases, bonuses, promotions, other benefits and, of course, termination. If most of this information, legitimately collected or otherwise, was used solely for employee benefits, very few would complain. But sometimes it is not, which is when employee privacy issues arise. For example, how much personal information is needed by the employer for employee benefits before it becomes an invasion of the employee's personal privacy? Are there restrictions on the use of that information? Does the employee have the right to view any information collected on him or her? Is employee surveillance legal, and if so, what legal avenues does an employee have?

Is employee surveillance an invasion of employee privacy? That depends. Notice that invasion of privacy does not mean collection of information on an individual without the individual's knowledge but rather the disclosure of collected information on an employee without legitimate reason or interest. An employer can gather information from the employees with whatever means as long as that information is not used maliciously. For example, an employer can collect information from an individual employee through covert actions like electronic monitoring and use that information solely to further business interests without disclosure to the employee. According to Adler et al, this procedure is legal and most courts have recognized it as a legitimate business interest and have sided with employers.

Individual information has become valuable not only to banks and insurance companies that want security for their money but also to a cross section of manufacturing and service companies. These companies want to find new markets for their products. In order to do that, they need a source from which to launch their marketing and get a foothold in specialized markets. This kind of information can best be got from employers. Once a company has gathered that information about individuals, it can model its market strategies around the characteristics exhibited

by these individuals. Such information may include income levels, leisure activities, foods, favorite wines and beers, whether one eats chili, and so on.

In this rush for personal information, the employer takes center stage as the best source of such intriguing tidbits. Statistics show that the workplace is only second to the home as a place we spend most of our time. It is common sense, therefore, that the workplace should be the next best place to look for information on an individual.

Electronic Monitoring

Electronic monitoring is generally the monitoring of employees using electronic devices like video cameras, computer equipment, audio devices, and many other concealed gadgets. In most cases, it measures the quality and usually the quantity of work and the ability and effectiveness of the worker. In other cases, it also measures the worker's habits on and off the work premises because some employers believe these habits have a great bearing on employee performance. For example, if the employee is a drug user, the effects of drugs will eventually affect the quality of that employee's work. Electronic monitoring of employees is characterized by workers' ignorance that they are being monitored, fear of the ever-watching eyes of the supervisor, and fear of how much that supervisor knows about them.

There are thousands of cases like these two arising from employee monitoring. Although there are no comprehensive studies on the spread of electronic monitoring in the workplace, it is generally believed that electronic monitoring of employees is on the rise and is already enshrined in the banking, insurance, and airline industries, to name but a few.

As technology becomes cheaper, therefore more affordable, smaller, and easier to conceal, the trend is likely to pick up momentum as the pressure for quality, quantity, and standards increases because of global competition. This is likely to force more companies to resort to electronic monitoring as a way to control employees to extract more performance, compliance, and probably more money. In fact, in some sectors of employment the percentages are already high.

Effects of Electronic Monitoring on Employees

The computer "monitor" counted the number of checks produced by an individual on a daily basis. According to the findings of the research, the group

that was monitored considered the number of checks printed as the most important part of their work. In fact, they thought that talking to subscribers was an impediment to their job of printing checks. These employees focused on those parts of their jobs they thought were being monitored and neglected all other essential parts. Although the monitored group did their work this way, the researchers found that the employees in the nonmonitored group had a different perception of their work. This group thought that dealing with customers was the most important part of their work.

Another research project conducted by Irving et al. compared two groups of employees working in insurance companies, financial institutions, and government. One group was electronically monitored and the other was not. The researchers looked at the effects of monitoring on issues such as job satisfaction, what employees consider as a measure of performance, amount and usefulness of feedback, and relationships among employees and between employees and supervisors. The results of the study were very similar to the of Grant's study. Employees put much more emphasis on quantity as a measure of performance; there was no significant usefulness in the timely individual feedback; rewards were based on electronic performance evaluations in the monitored group; and those in the monitored group felt, and rightly so, that they were more supervised than any other group in the company. From these studies, two important issues emerge:

1. Very often an intended goal of a monitoring program may be clouded by a different goal perceived by the monitored group. Therefore, without a well-thought-out electronic monitoring program, the intended goal of the company may be lost in the resulting perceptions of the employees.
2. The psychological effects on the monitored employees may be more severe than previously thought and anticipated. The philosophy that "if it isn't counted, it does not count" should not be allowed to flourish among employees.

Consequences of Electronic Monitoring

The most devastating effect of electronic monitoring on employees is fear of losing their jobs. For many of us, a job is the only source of a livelihood and any sign of losing it triggers fear. In addition to fear of job loss, electronic monitoring also causes the following problems:

- Reduced task variety: The type of work monitored most is of a low-skilled, repetitive nature. In these jobs, employees take the quota to be the measure of work and usually cannot afford to take a break, let alone slow down, thus increasing the monotony of their activities.
- Lack of individual initiatives: Most monitored jobs does not require personal creativity because they are of a low-skilled, repetitive nature. The employee usually is not allowed to vary the procedures but follows them to the letter.
- Reduced or no peer social support: Monitored groups are always given separate stations where gadgets can monitor them in full view. So, an employee must remain where he or she can be "seen."
- Lack of self-esteem: The isolation, the monotony of work, the lack of creativity, and the lack of freedom to vary job steps lower employee morale and consequently self-esteem.
- Lack of interest in the job: With low self-esteem, many people definitely lose interest in their jobs.
- Lack of trust among workers, between workers and supervisors, and between supervisors and management: This lack of trust can result in low company morale, and later the production levels may begin to fall. As employee morale plummets and dislike of the employer rises, workers turn to litigation, filing privacy suits against their employers.
- Alienation: Sociologists define the concept of worker alienation as lack of worker freedom and control, purpose and function, and self-involvement in their work. Alienation, according to Shepard, is lower among workers in industries with automated technologies.

Workplace, Employee, Health and Productivity

The productivity of workers depends on the quality of their physical and mental state. Employers have always strived to make their workers happy, healthy, and productive. There is now a movement to improve employee work environment as companies start to add facilities such as employee gyms, cafeteria, daycare centers, and worker facilities for their employees. For example, current Google, Inc. is cited by many reports to be the top company in this movement. There has always been a feeling of powerlessness among employees to control the state of working conditions because they lack freedom and control. According to Shepard, a worker has freedom and control at work if he or she can vary the steps involved in doing the job, determine work

methods and workload, and increase or decrease the speed at which the work is done. With the changing work environment due to advances in computer technology, employers are finding themselves achieving what has eluded them for years, offering their employees happiness, healthier environments, and high productivity through empowerment.

Human beings always want to feel they are in control of their work and other aspects of their lives. The changing work environment gives the workers a choice either to work in a traditional office or from home. Choice brings commitment and obligation. When people make a choice of their own, they tend to commit to the requirements of their choice. The commitment to work always translates into higher productivity quotas. Although computer technology has given workers more control in decision making, it has also given them new dangers in the workplace.

Ergonomics

Ergonomics is an applied science concerned with designing human–machine interactions that offer and maintain a safe, comfortable, healthy, and habitable work environment. With the increasing automation of the workplace, our dependence on machines is on the rise, and the field of ergonomics is correspondingly expanding. It now covers a wide array of work environments and factors that influence the employee's health and wellness through prevention of occupational diseases. In particular, ergonomics studies the design of human work and production because when the demands for human performance of a task exceed human capacity then ergonomic injuries start to occur and human wellness declines.

An ergonomic injury results when the demand on a person to perform a task exceeds that person's working capacity. Examples of ergonomic injuries include work accidents that occur due to the overwhelming demand for performance and all work-related musculoskeletal disorders such as back pain, neck and shoulder pains, and repetitive strain injuries (RSI), with most studies now are focusing on RSI.

Repetitive Strain Injuries

RSI is a set of work-related musculoskeletal disorders caused by repeated and prolonged body movement resulting in damage to the fibrous and soft body tissues like tendons, nerves, and muscles. Some RSI conditions are well known in medical communities, but a number of others are still very obscure and

difficult to diagnose because they present with different and very often unpredictable patterns. RSI as a disease is not new; it has been affecting people performing repetitive motions like cashiers, musicians, assembly, and data entry workers for years; it has just recently gained prominence because of the rise in computer availability and widespread computer use. Recent studies have isolated some of the main causes of RSI as repetitive motion, forced gripping, performance stress, alienation, static loading fixed posture, deviated wrists, and boredom. Computer users of keyboards, mouse, tracking balls, touch screens, and footmouse are among the groups most prone to RSI. RSI attacks those body parts such as tendons, wrists, shoulders, nerves, and arms and sometimes the neck that receive tremendous stress exerted by body movements. This condition, which has come to be known by a string of names like occupational overuse syndrome (OOS), cumulative trauma disorder (CTD), carpal tunnel syndrome (CTS), and upper limb disorder (ULD) causes serious pain and if not treated early may cause even permanent disability. As a result of the damage to the nerves, wrists, arms, tendons, and muscles, the disease also causes eyestrain, fatigue, headaches, usually back pain, tingling, coldness, hand numbness, and stiffness and discomfort in body movement especially fingers, arms, and the head. When RSI is caught in time, it can be cured with proper care and prescriptions that emphasize changes in individual work styles and techniques. Among the suggested changes in work styles and techniques are the following:

1. Use ergonomically correct work equipment. These may include chairs, tables, computer equipment like new keyboards, monitors, new software, and new lighting in the workplace.
2. Use a light touch on the keyboard to place less stress on body parts. Also, keep the wrists straight in line with your arms.
3. Take frequent breaks from your work. Do not work for long hours without a break. Once you get a break, walk around and do some stretching exercises.
4. Educate yourself about RSI.
5. If necessary reduce the time you spend at the computer terminal.

Improvements in the design of human work and occupational environments can result in benefits to the employee and the employer. Among such benefits are the following:

- Reduced medical bills
- A higher level of self-esteem
- Increased productivity because of fewer employee errors. High attendance rate and retention skills increase per capita output.

Studies have shown dramatic increases in the range of 20–50% in increased productivity after effective ergonomics, and remedies were implemented for people working with visual display units (VDU)

Stress

Besides RSI, stress has also recently drawn public attention as a work hazard. Like its counterpart RSI, stress has been targeted to explain a lot of worker discomfort and frustration that may lead to poor job performance, strained interpersonal relations, and erratic employee behavior. Stress is believed to have its origins in environmental inputs, and it appears through symptoms such as fear, anxiety, and anger. Anything that increases the stress level of an individual ultimately endangers that individual's health.

In the work environment, stress is mainly caused by a variety of factors including impending deadlines, long hours at work, uncooperative colleagues, lack of management support and understanding, constantly changing requirements, and lack of job capacity either because of changing work procedures or the workplace environment. Stress onset affects individuals differently depending on the environment they are in, and different individuals react differently to stress. For example, Ivancevich et al. report that under stress women consume less coffee than men, shout less but consume more aspirin, and visit doctors more frequently than men. Employers can significantly reduce employees' stress by enhancing the overall work environment, keeping consistent work schedules, giving fewer deadlines, and making fewer management demands. Health awareness and knowledge of the causes of stress are always the first step in controlling it.