

Ethics and Social Impact of Information Systems in Our Society: Analysis and Recommendations

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Abstract: *The evolution of information systems in our society today has grossly affected the way we live our lives. This has invariably led to the increase in ethical and social impacts that are rising in the society from health related matters to social threats. This study specifically examines the effects of ethical and social concerns of information systems on the society. The paper revealed the key technological trends that led to ethical issues and the moral dimensions of information systems on the society. It also analyzed and recommended ways on how to improve the effectiveness of ethical and social impacts of information systems in the society.*

Keywords: Ethics, Information, Information Systems, Social, Society

1. Introduction

The society in which we live has been so profoundly affected by information systems that historians refer to the present time as the information age. This is due to our ability to collect, process, store, disseminate and manipulate large amount of information using information system. As an information society, it is very imperative we consider both the social and ethical implications of the use of information system in our society.

Information systems as described by Whitten [14] is an arrangement of people, data, process and interface that interacts to support and improve day-to-day operations in a business as well as support the problem-solving and decision-making needs of the management and users. Also, Laudon and Laudon technically defined information systems as a set of interrelated components that collects (or retrieve), process, store and distribute information to support decision-making, coordination, and control in an organization [8]. Information systems contain information about significant people, places and things within the organization or in the environment surrounding it. By information we mean data that have been shaped into a form that is meaningful and useful to human beings [8]. Data in contrast is a collection of raw facts representing events occurring in the organizations or within our physical environment.

According to Pollack [11] people have become much more technologically savvy largely due to the dramatically increased scope of information available via Internet, the ease of access to information, and the broadened scope of computer literacy; the security of information and privacy of individuals have become areas of significant concern. Considering the fact that computers and information systems have become a fundamental part of our lives, the opportunities to misuse and abuse computer, the information it generates and systems now abound.

The increase in the applications of information systems in our society and its escalating growth has altered the face of almost every aspects of the society. The most obvious effects of information systems have been the rise of the internet and

its consequences in terms of how of information systems have changed the face of almost every aspect of our societies, most remarkably in terms of economics and culture or behavioral approach. Information systems can be viewed as a factor of production that can be freely substituted for capital and labor. As the cost of information systems continues to reduce, it is substituted for labor and capital, which historically has been a rising cost. Also, it helps organizations to lower the cost of their transactions thereby making it worthwhile for organizations to contrast with external suppliers instead of using internal sources. However, behavioral researchers have theorized that information systems could change the hierarchy of decision-making in organization by lowering the costs of information acquisition and broadening the distribution of information [8]. As an information society, we must consider both the ethical and social implications of the use of information systems in our society.

The digital world we are presently leaving is posing some important and new ethical questions such as who owns information, particularly information about us. Who is responsible for making the information accurate? Should we set guidelines on how business organizations and business professionals should use information, computer systems and information? And if that is so, what should these guidelines be? What penalties should be accessed for unethical norms and abuses? This topic is becoming increasingly so important so as to successfully manage the use of information systems in our society.

2. Ethical and Social Impact of Information Systems

As a matter of fact, changes in technology often affect the society. This can change individuals, jobs, education, government and social interactions. As component of a society, each group has rights and responsibilities to one another, such as right to privacy and obligations regarding ethics. The effect of technology on individuals can be beneficial or detrimental. But in most cases an alteration in technology may help a group of individuals and be harmful to another set of people. Typical challenges include loss of

privacy, depersonalization and change in incentives. The benefits include lower prices, better products and services. Many of these issues does not only affect our society as a whole, but also raise lots of questions for organizations and our working place at large.

2.1 Ethical Concerns of Information Systems

Laudon and Laudon [8] described ethics as the principle of right and wrong that individuals, acting as free moral agents, use to make choices to guide their behaviors. Information systems raise new ethical questions for both individuals and society because they create opportunities for intense social change, and this threaten existing distributions of power, funds, rights and obligations. Just like other technologies such as steam engines, electricity, the telephone and radios, information system can be used to achieve social progress, but can also be used to commit crimes and threaten treasured social values. The development of information systems will produce benefits for many and cost for others.

Another ethical issue that is giving a new urgency is the rise in the internet and electronic commerce. The internet and digital technology have made it much easier than ever for organizations to assemble, integrate and distribute information, thereby unleashing concerns about the appropriate use of customers' information, personal privacy and intellectual property. Other ethical issues include establishing accountability for the consequences of information systems, setting standards to safeguard system quality that protects the safety of individuals and society, and preserving values and institutions considered to be the quality of life in an information society [8].

According to Haag [5] as we prepare future professionals for employment in technological fields, it is important we develop a sense of awareness of the potential types of ethical issues that are common to information systems organizations. Included in a long list of issues that are covered by policies in most organizations are policies for ethical computer use, information privacy, acceptable use, email, Internet use, and an anti-spam policy [11]. Pearlson [10] pointed out that managers must be involved in monitoring outward activities of the business because customers and their privacy are affected when there are outward breaches. Other ethical issues related to information systems are:

(i) Health Risks

A lot of health related concerns such as Carpal Tunnel Syndrome (CTS), Repetitive Stress Injury (RSI), Technostress and Computer Vision Syndrome (CVS) are related to prolonged use of information systems. One should be aware of this health issues because it costs business huge amount of money annually in medical treatment claims and affects productivity. Although, ergonomics, which can be described as the science that studies safe work environments, or the study of the relationship between human and machines has helped to determine that it is cheaper to purchase equipment that will reduce the health risk associated with information systems such as different keyboards, monitors that reduce eyes strain and desks that allows proper body positioning.

(ii) Employment

Reengineering work is typically hailed in the information systems community as a major benefit of new information technology. It is much less frequently noted that redesigning business processes could potentially cause millions of middle-level managers and clerical workers to lose their jobs. One economist has raised the possibility that we will create a society run by a small "high tech elite of corporate professionals... in a nation of the permanently unemployed" [7].

(iii) Information Privacy

The invasion of privacy is a very big challenge associated with information systems, because it can accommodate vast amounts of data, we must therefore decide what information is proper to store or not, and who should have access to the information. Every time you use a credit card, make a phone call, withdraw money, reserve a flight, or register at school, all these transactions of yours are recorded by the systems. These records can be used to learn a great deal about you, where you have been, when you were there, and how much money was spent. Should this information be available to everyone? Information systems are also used to store information about individuals' credit rating, which may determine their abilities to borrow money.

2.1.1 Ethical Analysis

This section presents various step processes of how one should analyze ethical concerns when confronted with such a situation:

(i) Identify and Clearly Describe the Facts

This involves finding out who did what to whom, and where; when and how. In most cases, you will be astonished of the mistakes in the initially reported facts, and you will find that simply getting the facts straight helps in defining the solution. Also, this assists other opposing parties involved in an ethical quandary to agree with the facts.

(ii) State the Inconsistency and Identify the Higher-Order Values Involved

The parties involved in disputes over ethical, social and political concerns always claim to pursue higher values such as privacy, freedom and protection of property. It is very important to clearly define the conflict in ethical concerns and identify the ones with higher values.

(iii) Identify the Stakeholders

You must find out the identity of the stakeholders as every ethical, social and political issues have stakeholders; players in the game who have an interest in the outcome and that have invested in the situation and what they want.

(iv) Identify the Reasonable Options to Select

It may be discovered that none of the options may ever satisfy all the interest involved while some of the options performs a better job than others. So, sometimes concluding at a good or ethical solution may not always be a balancing of consequences to stakeholders.

(v) Identify the Potential Consequences of Selected Options

Some options may be ethically right but disastrous from other points of view. Other options may work in one instance and not work in another similar instance. But always ask yourself the consequences of any option chosen.

2.2 Social Impact of Information Systems

The increase in the application of information systems in our society has changed the face of almost every aspect of our society and cultures. The most obvious effect of information system has been the rise of the internet and its consequences in terms of how we communicate, socialize, learn and do business to mention but few. However, before considering the implications of the internet, which is basically linked to that of the computer, we shall foremost explore some important features of information systems and what they mean to us.

Firstly, we must not forget that the computer was primarily designed as a means of solving arithmetic and logic problems, and data storage. The development of the computer from these modest roots are the complex machines of today which allow us to work out more complex problems in a way that would have otherwise been impossible and store more information. This affects our society in two ways: On an individual basis it means that any person in possession of some kind of a computer has the capacity to store every document they will ever need in a single compact machine. This connotes that computer allows people to set up businesses and work from home on a scale never seen before, not to mention taking the human progress a step beyond that of the printing press by removing the need for hand writing for the first time in our history. On a larger scale, it allows scientific progress to accelerate as mathematical problems incomprehensible to humans can be worked out by simple programmed machines. The effect of computer storage capacity is to totally change how large scale businesses function, by assisting inventory management, by facilitating and expediting the storage of data important to organizations, for instance: customer preferences or phone numbers.

Another effect of information systems is the rise in computer games. This has caused serious worries over how they affect those who use them, and especially their effects on youth. The debate still rages over whether the large number of violent computer games available influences those who play to imitate such behavior, with a host of scientific research being done on the issue. Yet almost worrying are the statistics which seem to be highly addictive to the quality of such games - most notably internet based ones. In contrast many have begun to see the potential computers held as a means of education, since, unlike other traditional forms of teaching tools, computer game based learning has a propensity to entertain the student. Businesses and organizations are already using computers as educational devices and technology development tools, especially in the field of virtual reality games and more would still follow. Whatever one's feelings on the growth of these video games, in both recreational and educational formats they are becoming ever more of a reality, for instance the United

States military uses one of such game as a recruitment device.

Another interesting and undeniable effect is the use of internet in the societies worldwide; in fact, it could be said to connect and eliminate differences between geographically and culturally separated societies. The effects of the computer are still developing; nevertheless it is already obvious that they are sufficiently wide reaching to far surpass an answer of this length. Ultimately the internet is a means of communication. One of the results is to make learning democratic. At the click of a mouse anyone with a computer, regardless of their wealth, status, or education, can access a practically limitless supply of knowledge. A benefit of this is that with the correct internet know-how, one can find out almost anything in a matter of seconds; it revolutionizes the way people go about research.

However, the same capacity for multiplying information which makes the internet great and threatens the whole organizations as music, films and other forms of entertainment and information are released free of charge onto the web. Inevitably sales of CD's and DVD's have fallen as the use of the internet has grown, and indeed the speed of the web's growth has made it nearly impossible for media companies to find ways of stemming the problem. Equally, in the same way that the internet gives every single person with a computer a voice with which they can share their thoughts and ideas with the world, so too has the number of offensive sites grown with the development of the internet, from pornographic sites to the more worrying cases of websites designed for the sharing of pedophilic materials, as well as racism and even terrorism supporting sites. The technology field has been overtaken with other types of behavior that can affect anyone who uses technology such as computer crime.

Computer crime is another prevalent social impact of information system in our society. The term computer crime as described by Valacich [13] is the act of using a computer to commit an illegal act, such as targeting a computer while committing an offence, using a computer to commit an offence, or using computers in the course of a criminal activity. Computer virus and hacker attacks are intended to destroy data and software and disrupt computer services. In the year 2002 alone, more than 7,000 computer viruses were reported [6]. Phishing attacks frequently target a specific group of people and are intended to secure personal information, usually financially related, from innocent and unsuspecting responders [4]. Other types of the crime that are ubiquitous include carding, cloning, data diddling, phishing, shoulder-surfing, salami slicing and social engineering.

Correspondingly, the increasing recognition of social networking sites is a double-edged sword. On the one hand it has allowed people to connect and communicate with one another with ease and scale never seen before. At the most basic level this began with email, which alone can be seen as nearly equal to the invention of the telephone in terms of communication. Some social sites like the www.facebook.com have more members than the average national population. The fact that the internet allows such

forms of communication to be free makes it democratic. The potential of such sites to be used for the good of the people can be seen recently in the part played by Face book in Middle Eastern uprisings of Egypt, Tunisia, Algeria and Libya, when it was used by rebelling citizens as a way of coordinating strikes and marches. Yet equally there are many cases of children being groomed by sex offenders through these websites.

3. Emerging Technological Trends That Leads To Ethical Concerns

There are no doubts that ethical concerns have long preceded information systems. And information systems on the other hand has increased ethical concerns, created problems and threats to established societal rules, and new advances have made some laws archaic and possible threats to privacy and ethics. There are four basic technological trends responsible for the ethical concerns, these are stated as follows:

(a) Increase in Computing Power

The increase in the computing power gives a faster access to the information stored in it; this has invariably increased reliance and vulnerability to computer systems by individuals and many organizations.

(b) Decline in Data Storage Cost

The storage of data online is one of the factors that led to the decline in the storage cost. Thus, this has made several organizations to easily maintain and increase detailed databases of individuals.

(c) Advance in Data Analysis

This technological inclination has given organizations greater ability to analyze detailed personal information of individuals from vast quantities of data gathered; and also to develop detailed profiles of individual behaviors and non-obvious relationship awareness (NORA).

(d) Advance in Networking and the Internet

This has enabled copying and movement of data from one location to another and accessing large quantities of personal data from remote locations with ease.

4. The Moral Dimensions of Information Systems

The moral dimensions that can control the major ethical and social concerns generated by information systems are as follows:

(i) Information Right and Obligation

What information rights do individuals and organizations possess with respect to themselves? What can they protect? What obligation do individuals and organization have concerning this information? [8].

(ii) Property Rights and Obligations

How will traditional intellectual property rights be protected in a digital society in which tracing and accounting for ownership is difficult and ignoring such property rights is so easy? [8].

(iii) Accounting Liability and Control

Determining who should take responsibility for decisions and actions. Many of the laws and court decisions and actions establishing precedents in the area of accountability, liability and control were firmly in place long before information systems were invented.

(iv) Quality of System

This has to do with data quality and system errors. As we rely more on information systems, data quality issues are gaining more importance. These issues affect you as a consumer and as a user.

(v) Quality of Life

An interesting quality of life issue that affects more and more people personally is the ability to work from home. Before the advent of information systems most people used to have a regular day job 8.00 a.m. to 5.00 p.m., five days a week in a typical office setting in our society. But with the introduction of information systems people can work seven days a week, all hours of the day, at home and on their ways especially the management staff in a company. Also, the quality of life issues would be incomplete without mentioning online love affairs. People also lose their jobs and ways of life because of information systems. All these are valid concerns of information systems.

5. Codes of Ethical Conduct in Our Society

According to Woodbury [15], instead of investing in “the perfect crime detection tool, a better approach might be to virtue ethics”, and goes on to suggest that perhaps an “honour code” would be a better solution. The essence of creating codes of ethical conduct in our society is to give the public a sense of trust in a group of professionals. These professionals make good use of these codes to define the limits of their activities and to help guide them in their businesses and organizations. The codes of ethics are promises by professions to control themselves in the general interest of the society.

Most organizations have developed guidelines for the ethical use of information system and computers and most computer-related professional institutes have also published guidelines for their members. Higher institutions of learning and public schools have developed guidelines for their students, faculty members and employees about the ethical use of computers. In addition, they encourage all their system users to act responsibly, ethically and legally whenever they are using computers and to obey accepted rules of online etiquette. Some of the impacted ethics and public policy guidelines prohibit the followings:

1. To interfere with other people’s computer files
2. Spying other peoples files
3. To harm other people with the use of computers
4. Stealing with the use of computers
5. Using computer to bear false witness
6. Copying and using proprietary software without license
7. Using other peoples computer resources without legal authority

6. Conclusion

The study was carried out with a view of assessing the emerging technological trends that information systems are posing on the society. New challenges that have not been dealt with before in the society are beginning to materialize. There is no doubt, the society is becoming more aware of the increasing complexity of information security and the ethical concerns that revolves around the massive amount of possible infringes. Since it's our world and future, we should be concerned and involved in its resolution. In view of this, various organizations in the country especially the oil and gas industries are taking preventive actions through the enactment of codes of ethics and codes of conduct. Government agencies have also supported the society with legislation for the protection of data integrity and privacy of individuals.

Despite the benefits associated with the applications of information systems in our society, there are some underlying issues that arose from the main discussions. Based on these, the following recommendations are suggested:

- The society must ensure each person is accountable for everything he or she does, no matter how inexplicable his or her action may appear.
- Since there are growing complexities of ethical and social issues that revolve around multiple breaches, it becomes imperative for the educators and computer professional bodies to develop curriculum on ethical and professional codes of conduct in the information society
- There is need to lay emphases on information systems security controls
- The government should develop a comprehensive laws and legislations to create a sense or awareness of compliance requirements that affects information systems professionals.
- Our law enforcement agents should be more sophisticated in their computer crime investigation. This can be enhanced with the use of computer forensics, which is a formal investigative technique used in evaluating digital information for judicial review.

7. Future Scope

The introduction of information systems in our society can be usefully divided into three phases, two of which have already occurred: the introduction stage and the circulation stage. We have only recently entered the third and most important phase which is the control phase; in which many of the most serious social, political, legal and ethical questions involving information systems will present themselves on a large scale. Some of the discussions in this paper will give one an insight that the future developments in information systems will make ethics and social impacts more vibrant and more important than ever.

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