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Human, Social, and Ethical Aspects of Information Technology Management Systems



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Synonyms

Humanistic aspects of IT management systems;
Anthropocentric aspects of IT management systems

Definition

There are innumerable definitions that have been proposed regarding the concept of ethics throughout the ages. One of the simplest and most general, while at the same time most illuminating, defines ethics as a set of moral principles that drive the behavior of a person. By implication of this definition, ethics are not fixed, since the moral principles of both individuals and societies can be changing, even volatile. There is a strong philosophical and ethical tradition in Western countries coming from the ancient Greek schools of thought. This tradition, although important

in the West, cannot eclipse other philosophical and ethical traditions, for example, the Chinese and Indian traditions; and since no one can be considered superior to another, it is necessary to construct an ethical paradigm based on the diverse cultural currents and historical traditions of the world. Said paradigm would have as its main advantage its integrating character, although one cannot ignore the complexity inherent in the attempt to reach a universally accepted agreement on what behavior is ethical or not (Gammack and Goulding 1999).

Introduction

Information technologies (IT) are instruments that make it possible to streamline the processes of capturing, organizing, combining, using, storing, and disseminating information. As such, they use a material – information – which, although intangible, has a relevance that can be significant because of its influence on goods and people through the decisions made using it. Since the large-scale development of computers and information technologies in general, an important role has been given to technological factors and those related to the development of methodologies that help ensure the success of information systems. This vision was logical due to the high cost of technological infrastructures and the personnel

in charge, which constituted a strong condition for those responsible for information systems and technologies. Over the years, the great development that information technology has experienced has led to the economic factor being moved increasingly toward the background and other factors, previously barely considered, gaining prominence (Cederberg and Valenza 2012). Some of these factors are related to the human sphere and have to do with personal, social, and ethical issues. In the following sections, considerations will be made on these issues and how they can affect the work of educational management teams in terms of their decisions regarding the IT infrastructure in their charge.

Ethics and IT

It is not easy to find a balance between the protection of information of a personal nature and the right of the rest of society to know information that may be of public interest (privacy vs. freedom of information). This dilemma becomes even more difficult considering that we are immersed in an information-intensive society of a multicultural nature, which is, therefore, continuously growing in complexity (Hagen 2009). It could be argued that the ethical aspects present in the management of educational IT, since the field of ethics is dynamic and continuously evolving, integrating different perspectives and cultures, are nothing but a mirror of the times, marked by a continuous cultural and economic globalization.

Having the ability to collect, process, store, and use information gives a form of power to educational managers. For this reason, educational managers must be aware that this power has an associated level of responsibility and that its objective is to use the available information to offer a set of services that allows the stakeholders of the education system (students, teachers, administrators, parents, and society in general) to work more efficiently or improves the quality of their lives.

At this point, it is pertinent to distinguish between aspects related to the assurance over privacy of information, for which procedures

have been developed under laws in many countries, and others that have to do with decisions of an ethical nature. The first group can include questions such as who should have access and to what information; how to protect individual privacy; what should be considered as information belonging to the education center; what information to offer to other educational entities and to society in general; or how long to maintain the storage of electronic records, to give some examples. For this purpose, laws such as the EU directive on the processing of personal data (European Union 1995) and the US Health Insurance Portability and Accountability Act (1996) have been promulgated. On the other hand, other aspects also intervene, fundamentally of a social and human nature, on which it is more difficult to legislate, but which have great importance due to their influence on people and societies. In order to cope this broad spectrum of situations, some codes of ethics have been developed by numerous prestigious institutions. These codes do not only focus on aspects related to the privacy of information, which, as has been mentioned, is an issue widely accounted for in numerous national laws. The following can be mentioned in this group: (i) Ethics Code of the American Society for Information Science, (ii) American Library Association, and (iii) International Center for Information Ethics (ICIE).

Technology has an impact on society as a catalyst for innovation. IT, which is possibly the fastest developing form of technology in the history of mankind, has impacted all societies across the globe. This impact, which is not only economic but also of social type, is not alien to any kind of ethical interpretation. At the educational field, at times, it is difficult to elucidate at precisely what moment the managerial teams of education centers should intervene to avoid any damaging effects on individuals and on society, as a whole, that could result from an unethical use of IT at education centers.

Effect of IT on Work and Work Strategies

IT, from its inception, has had a double influence on the generation of employment. The need to

provide organizations with competent people to implement and maintain complex computer systems, both in terms of hardware and software, has generated a requirement for specialized personnel and, from the beginning, the impulse to create new studies, both vocational and superior, aimed at training a new type of professional. It can be said that the rise of studies related directly or indirectly to IT (information technology, electronics, telecommunications, materials physics, etc.) has influenced and, at the same time, has been influenced by the development of IT. These are professional careers that either did not exist or existed with relatively little importance (as in the case of telecommunications engineering) just a century ago. Today, such occupations are considered a fundamental part of the professional sphere and constitute a significant number of the courses on offer both in terms of vocational training and in higher education. The individual trained in these professions continues to enjoy favorable expectations of professional integration, given that the new manifestations of IT (social networks, artificial intelligence, cybernetics) also demand new professionals, and it is highly likely that the demand for this type of professional will continue to increase for the foreseeable future (Mardis et al. 2017).

However, parallel to the development of IT and its favorable implications for job creation, it has also helped to give rise to, on the contrary, a phenomenon of job loss (Trusson and Woods 2017). This is due to the increasing automatization of tasks that can be carried out more efficiently by automated systems. A job loss also may occur in those occupations that IT can support in such a way that a smaller volume of human labor is necessary. This is the case, for example, for workers on assembly lines, accountants, and in areas of the administrative field, among many others. This double implication of IT has been debated for a long time, and experience seems to point to the need for continuous adaptation of professionals to the new environments developed by IT, through training and professional retraining. The most pessimistic consider this phenomenon a steady and inevitable replacement of people by machines, while the most optimistic

consider it an opportunity for people to do more creative and stimulating work, leaving repetitive, monotonous and mundane work for the machines.

In the field of education, where IT has also burst in through the door, there has not been a significant, negative effect on the level of employment for human beings. For educational managers, traditionally, the priority has been to use IT as a tool for improving the teaching-learning process, enhancing the teacher's role in the classroom rather than usurping it, which has meant that, in this particular area at least, there has been no substitution of human beings for machines. On the other hand, given that the administration of education centers, except the most complex ones, such as universities, has not traditionally included a strong human component for the accomplishment of administrative tasks, there has not been a dramatic change in the level of employment in these positions either at schools or education centers in general. The administration staff of these centers, from the smallest to the largest, use IT as a support tool, although it is still necessary for them to perform functions analogous to those that were done before the inclusion of the IT in processes pertaining to the administrative duties of education centers. However, educational managers should consider in their future agenda the possibility that IT will significantly affect the number of teachers in their centers. The development of teaching materials by companies and organizations specializing in education and massive online training systems, among others, may lead to the choice of using these resources, compelling teachers to acquire a lesser role in the formative process and reducing their numbers overall.

Another aspect related to the possible negative influence of IT in the workplace may spring from its tendency to break down the boundaries between home and work-life. The availability of electronic devices that, via different types of networks, allow contact with the office, both by voice and by data, is increasingly resulting in the home becoming an extension of the workplace. This subtracts from time that belongs to the individual and that should be regarded as personal. Often, managers make use of mobile phones, e-

mail, or messaging apps to contact employees or colleagues regarding work issues during non-office hours. On the other hand, the workload, insofar as meeting objectives and deadlines, can be so demanding that it gives rise to the need to continue working at home, creating the paradox that it is the employee who shoulders the expense of contracting, and paying for the services of, service providers who ensure the quick access to the network that makes the home a more efficient workplace.

In the field of education, it is relatively easy for this circumstance to occur due to the fractional nature of the work. Of the professional group with the greatest presence in education, teachers, it is usual for a large portion of their activities to be carried out outside of the workplace, for example, preparation of classes, correction of tests and exams, preparation of teaching materials, etc. Educational managers may encounter the counterproductive situation that even if they intend to avoid practices that lead to teachers working outside of their place of employment or work schedule, they actually promote this situation with their decisions. The creation of virtual electronic work spaces (online repositories of teaching materials, tracking and management of student activity systems, online administrative systems, etc.) can lead to the continued use of IT from the homes of the teachers. In this case, it is difficult to establish any kind of recommendation. The incorporation of this type of electronic virtual environment has become a practical necessity at all levels of education and trying to prevent or reduce its use outside of the hours or place of work could impede one of its main advantages, which is its ubiquity and the possibility of access from any place and at any time. In any case, like practically all ethical aspects related to IT, it should constitute an element of collective reflection on the part of the staff of education centers. In this way, if it is necessary to develop some kind of ethical code in this regard, it should be the result of collective reflection and commitment.

Environmental Considerations

The environment poses a question that has been incorporated relatively recently into the set of social and ethical variables related to the use of IT. Concern for the environment has meant that aspects which, in the past, went unnoticed are taken into account, such as the energy consumption of electronic devices, the life cycle that has ultimately led to the manufacture of each device with its environmental cost, and, finally, the influence on the environment once devices are discarded and become waste materials. The first of the issues is related to the consumption of electricity that keeps the IT infrastructure in operation, both in terms of the equipment itself and the facilities in which they are used (light, air conditioners, etc.). This issue must be addressed by educational management teams in an active way, providing facilities with systems that ensure the effective shutdown of equipment and utilities when not being used, as well as promoting the awareness of users regarding energy expenditure. In this sense, it could be very useful to inform users about the link between the savings in electricity with a lower level of the emission of CO₂ and other greenhouse gases (Bekaroo et al. 2012).

Another important environmental aspect is the knowledge of the manufacturing life cycle of the electronic device. The manufacturing life cycle reflects the environmental cost of developing a particular device. The life cycle, in the case of computers, quantify the use of minerals, plastics obtained from fossil fuels, the consumption of manufacturing facilities, the transport of raw materials and manufactured products, etc. All these inputs are summed up to obtain a value that indicates, either in the form of spent energy or generation of polluting substances, the negative effect that the manufacture of electronic components has on the environment. The environmental costs could be reflected in a "green label," which would complement the information regarding the sale price of the product and which, along with the price, serves as a guide to making purchasing decisions. In the case of education centers, which usually carry out purchases of computers and other electronic equipment in bulk, it could

contribute greatly toward environmental awareness if all stakeholders were informed about the ecological footprint left by the manufacturing life cycle of devices so that an appropriate purchasing policy could then be followed. This policy would not grant the highest purchase priority to the price or to other variables, such as the availability of technical support services, but to a new, environmentally sensitive variable. Certainly, this policy could imply extra economic cost in the purchase of equipment, although it could be justified before the education authorities for the environmental benefits that it would entail. In addition, acting as pioneers with this type of initiative and, above all, communicating it to other stakeholders may send a powerful message that could be copied and replicated by the families of the students in their purchases of electronic devices.

Related to the environment is the issue of outdated or obsolete electronic equipment becoming waste. Concerns are often raised over the lack of environmental responsibility that sees electronic waste products ending up being deposited along with regular household rubbish in landfill sites. This irresponsible action is detrimental because electronic devices can include mineral components that are harmful to the environment (mercury, lead, etc.), so these must either be deposited at an approved recycling center or else selective collection of waste must be carried out that ensures its shipment to the appropriate centers for dealing with these materials and substances. Certainly, at the level of the education center, the responsibility of its management teams ends when the discarded equipment is deposited in an approved center for recycling or selective collection, but it should not be forgotten that there should be some form of assurance by the competent authorities that the recycling facilities comply with the parameters established for this type of center (Agarwal and Nath 2011). It has been detected that, in the past, some of these companies have diverted waste to developing countries, where they are abandoned without any recycling process occurring. In this sense, an initiative of the educational management could be to prolong the working life of these devices. Sometimes, a plan to update equipment, based mainly on

increasing the capacity of some of the components of the motherboards of computers (RAM, processors) or their hard drives, is enough to prolong for a significant time the use of computers, depending on their intended use at the educational center. On other occasions, when they have definitively reached the end of their life span according to their purpose within the educational center, their usefulness can be extended by transferring them to institutions or organizations whose users require less computing power and can take advantage of them for other uses.

Health and IT

Concern over health has brought with it an interest in working conditions due to the circumstances in which people interact with the physical elements that surround them, which have been designed precisely to help carry them out their work. Working for a long time with physical and technological devices and instruments can adversely affect health. This detrimental effect on health can be translated into the occurrence of illnesses and diseases that, in the end, mean a reduction in the effectiveness and efficiency of the worker. Therefore, it is neither beneficial to the worker nor to the organization in which the work is carried out. In identifying the negative effects on health and on the productivity in general, there has been growing concern for the improvement of the conditions of interaction between individuals and the devices they use, leading to the development of a scientific discipline called ergonomics. The goal of ergonomics is to understand the interactions between humans and the physical elements that surround them, based on theories, development of work methods, and designs aimed at optimizing health and improving results at work. IT, being another form of technology, can lead to injuries and health problems caused by prolonged use. For this reason, those responsible for the management of IT infrastructure must take this matter into consideration in order to ensure the health of staff (Ahmed and Shaikat 2018).

Specifically, the continued use of IT can lead to physical ailments such as headaches, blurred vision, backaches, fatigue, eyestrain, wrist and finger pain, and repetitive stress injuries (Nicolakakis et al. 2017; Andersen et al. 2011). Based on the ergonomic proposals that have been developed to reduce the likelihood of the manifestation of these ailments, educational managers must promote healthy habits as part of the work routine. It is recommended to receive advice from healthcare institutions, as well as from the educational administration itself about the location and disposition of physical equipment and optimal working conditions (light, ventilation, correct positions to take up at the computer or while using other devices, etc.). These recommendations must be communicated to the user so that they are aware of the importance of following a pattern of healthy behavior regarding the use of electronic devices, and so they adopt all those measures that, in the end, will result in their own good health.

There is another, more subtle consequence of IT use that can affect health, which is hard to warn of and difficult to avoid, known as “technostress.” It is a state induced by heavy use of electronic devices that can generate impatience, frustration and a special kind of sensitivity, and even hostility, toward other people. The possible root cause of this phenomenon lies in the exposure to long working days in computing-intensive environments (Jensen et al. 2002). Subjects, in these situations, end up themselves acting like mere computers, with terse, emotionless responses and an absence of human warmth. Quite commonly, this state of mind manifests in outbursts of anger directed at co-workers when they are, for example, slow to provide answers, or at the electronic devices themselves when they do not function efficiently, among other behaviors. Other nonphysical harmful manifestations that also affect the mental health of people are, for example, the stress and anxiety related to the desire to control technology but the inability to do so, resulting from the continuous development and commercialization of new versions of computers, new operating systems, applications, forms of interaction with

technology, etc. One of the most damaging consequences of this stress and anxiety is so-called burnout syndrome, whose most visible symptoms are permanent exhaustion and lack of interest in work. In a similar vein, Internet addiction can be cited, which, through online roles, virtual reality and access to massive amounts of information can generate a feeling of stress at not having enough time to access or assimilate large amounts of information, as well as discomfort or depression when, on the contrary, it is not possible to be connected to the network. The cited manifestations are normally outside the scope of responsibility of educational management teams since they are individual emotional behaviors. However, the incorporation of procedures in the corporate code of ethics of the school, which facilitate the self-identification of addictions or asocial behaviors, can be of great help as a first step for individuals to be aware of the problem and, individually or with assistance, develop skills to overcome stress and anger.

Equitable Access to Individuals

Guaranteeing equal access to information and IT resources is a key issue in trying to ensure that social inequalities do not occur. In this section, we can mention the economic differences that can lead to significant portions of the population being unable to access technology and more specifically the Internet (Gremigni 2018). This situation is known as the “digital divide” and occurs both between continents and countries and within the countries, regions, and communities themselves. This difference can mean in the long term that, in the educational field, there are differences between the level of access and use of IT infrastructure for students, which can condition their professional and social future. This issue corresponds, above all, to political decision-makers in the field of education, although the managers of education centers must be alert to the problem in order to prevent, to the best of their abilities, this type of situation from arising within their sphere of influence. Within this section, it is especially important to guarantee access to technology for

groups with disabilities. These groups require access to assistive technologies that enable them to overcome their disabilities and place themselves on equal terms with the rest of the student body. Technological developments have allowed for significant changes regarding this matter. Thus, for example, voice input devices, eye tracking systems, Braille keyboards, etc. have contributed greatly toward reducing the digital divide between students with and without disabilities. Educational managers must ensure the availability of the resources that enable these groups to access information and IT infrastructure on equal terms. It is not only a measure based on an economic condition; it requires a high level of commitment of the part of management teams so that, beyond the mere acquisition of electronic equipment, their effective use is facilitated.

The feminist perspective is another factor that has made its appearance in the field of IT use, although in recent times it seems that the debate regarding the different capacities and motivations related to gender has decreased in intensity. The issue has its origin in numerous studies that showed a lower level of interest by female students in the use of IT and a lower self-perception of capacity to use it than that shown by males. This situation created some alarm because, if confirmed, it would mean that half of the population could not be easily incorporated into working environments, current and future, based on heavy use of IT. Such a situation would generate a digital divide between the sexes whose long-term economic and social implications could be very negative. However, numerous recent studies point to the fact that it is more a problem of self-perception and self-demand with respect to the use of IT than due to a lower level of competence (Johnson 2012). In this sense, it is an important task on the part of educational managers to ensure that no type of attitude persists that discourages women at any stage of the educational process from attaining the same level of IT proficiency as their male counterparts or, most importantly, encourages a female inferiority complex regarding IT use. If necessary, educational managers should insist that teachers do not accept any difference between male and female students in terms of

their interactions with IT systems (Vitores and Gil-Juárez 2016).

Actions to Be Taken by Educational Managers

The typical size of education centers is not on the scale of large corporations or governmental centers, where the volume of employees with access to the IT infrastructure makes it necessary to have a corporate code of ethics in relation to IT. However, the small size, comparatively speaking, of schools should not be a pretext for not developing a specific set of ethical standards that guide the use of IT and handling of information in general. This code could be part of a broader one which would include any deontological or ethical consideration related code of conduct to be followed by all stakeholders. An ethical code of conduct in relation to information and IT should, at the very least, include the following dimensions:

Responsibility and control over information and IT infrastructure. A single person should be designated to be in charge of all information systems and technologies, as well as manage information. It would be their responsibility to ensure the individual rights of all stakeholders of the education center, the rights of privacy protection, the quality of information systems, and quality of life (e.g., ergonomics, job design, health of employees, etc.).

Rights and obligations over information. The limits of privacy should be established in terms of the use of certain applications (e.g., e-mail) and of the information that the organization has about the various parties, especially the students due to their particular vulnerability.

Summary

The continuous development of IT has meant important changes in the human and social relationships of the people who use it. Undoubtedly, IT has had positive implications that have contributed to improving people's lives. However, other

implications have been negative, affecting, among other things, behaviors, relationships, and even the health of IT users. These harmful side effects of IT use are subject to analysis in an effort to discover their causes and the ways in which they can be alleviated. The most common response to the ongoing social and human challenges concerning IT has been the development of codes of ethics regarding the use of information and IT infrastructure. These codes are continually updated according to feedback regarding new challenges that arise and with the experience gained over time. In the field of education, information and IT management also pose ethical challenges. The experience accumulated in other sectors of activity can serve as a reference for actions to be carried out that minimize the negative effects of IT on the various groups that participate in the education system. Educational managers must be aware of these negative effects and address them, leading the development of ethical codes within the education centers for which they are responsible. The success of these codes of ethics depends on the degree of involvement of the management and the motivation that they can muster to achieve their assimilation by all the groups involved.

Cross-References

- ▶ [Ethics](#)
- ▶ [Self and social regulation in minecraft](#)
- ▶ [Socio-cultural Issues and Technology, Media Literacy \(Media and Information Literacy\)](#)
- ▶ [Teachers and IT, Ethics](#)

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