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RESEARCH ARTICLE

ETHICS AND INFORMATION TECHNOLOGY-HOW TO MEASURE ETHICAL ENVIRONMENT

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ABSTRACT

At present, emerging information technologies or computer technologies are all pervasive and have tremendous benefits but also raise some ethical and social concerns. Let us have an understanding of such issues before we may think of addressing the possible social and moral fallouts arising out of it. In this paper, it has been tried to highlight the importance of ethics among information technology professionals to ensure that computer technology is not used in the wrong way which can harm people, our environment and the society. IT professionals need to be fair, loyal, honest and have ethical practices while working for an organization to make it a success. IT professionals have to abide by codes of conduct like at *Harvard University* which has a well-drafted '*IT Professionals Code of Conduct to protect Electronic Information* and a sort of self-policing.' A grading methodology can measure the ethical environment of an organization for creating benchmarks in an entity.

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INTRODUCTION

It is a well-known fact that Information technology offers several benefits to society. The risks are also too high. A new branch of ethics, as an area of study, has grown from the social and ethical implications of this technology.[1] The purpose of this analysis is to bring together human and societal values with IT or Computer Technology so that it may lead to progression and protection of human values instead of damaging them.[2] Briefly, ethics concerns an individual's moral judgments about right and wrong. We are concerned with the subfield of ethics which would deal with procedures, values, and practices, which govern the processes of computer technology and its allied disciplines without adversely affecting the moral beliefs and values of individuals, organizations, and entities. The importance of ethics in computer technology has grown exponentially because of our increasing dependence on computers in our daily life and rising number of cybercrime issues, software piracy, pornography, and hacking. Computer applications and websites are tampered with, resulting in the invasion of our privacy.

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The term "computer ethics" is open to both narrow and broad interpretations. In its narrow definition, it can be understood concerning professional philosophers attempting to apply traditional ethical theories or virtue ethics in the use of computer technology. In its broader interpretation, it may mean standards of professional practice, codes of conduct, laws and corporate ethics.[3]

What are the challenges?

With the increase in importance, IT or Computer Technology experts and professionals have to be well prepared to face the challenges staring in the face. Some challenges are lack of privacy, copyright infringement, piracy, security, and other cybercrimes. As computers have brought about speed, access, and flow to information, the cybercrime has become an ever-growing profession. With the increase of digital networks, individuals, businesses, and organizations have been falling prey to cyber crimes and the tools provided by emerging technologies have brought about serious challenges. Few of them are listed below.

1. ***Issue of Privacy:*** The topic of privacy is being discussed all over the world concerning the use of computer technology. Since information sharing and search for relevant data online is possible over the internet, it has exploited our freedom of privacy. A hidden webcam, as an example, could be used for spying over computers. Social networking sites, like *Facebook,*

[1] Simon Rogerson, Center for Computing and social Responsibility, De Montford University, The gateway, Leicestor, LE1 9BH; email: srog@dmu.ac.uk

[2] Simon Rogerson, Business ethics, https://onlinelibrary.wiley.com/doi/abs/10.1111/1467-8608.00051

[3] http://plato.stanford.edu/archives/win2001/entries/ethics-computer/

have been used to steal or misuse the personal data of many. The well-known controversy about *Facebook* data used by another company to influence general elections in the US is fresh in the minds of people. The data was alleged to have been used to know the voters' inclinations and habits. On another social networking site *WhatsApp*, one can forward photos and data of unsuspecting individuals across national boundaries with complete ease. Fake news is freely circulated on such sites without an attempt to verify its genuineness or its credibility. The issue of collection of biometrics and data of individual by the government has been vigorously debated in India.

2. ***Security:*** Hacking has become familiar with internet permeating our lives. Hackers can intrude computers or networks connected to the internet. Viruses and cookies are sent which can steal the data of the computer user, including the web surfing habits of the individual. Even big companies use cookies to determine which products and services they can advertise to us. On online banking transactions, the transfer of money can be interrupted or misdirected by the hacker, affecting both banks and their customers. There has been news about bank ATMs connected with bank computers hacked. Credit and debit cards hacking have become quite common.

3. ***Copyright Infringement:*** All over, movies, videos, music, and other digital formats are being freely downloaded from websites causing financial harm to their creators and developers. Pirated CDs and DVDs are being sold in markets. Even new movies are secretly digitized and sold in the 'grey markets.' With information sharing over websites and computer applications, original creators and developers of such works are losing the credibility about their digital products. Every day free download sites for music albums books, software, and web templates are popping up where one legitimate user would upload the purchase for free download across the world. It may be good news for the users as they save money, but it harms the original creator of these works. The governments lose tax and other forms of revenue due to piracy.

4. ***Pressure on experts to control cybercrime:*** Due to the interconnectedness of computer systems and networks, the experts in this field have to work round the clock to protect their system from hackers, data stealers, viruses and software pirates. It increases costs for all. The individual users have to buy anti-viruses and other software to resist such attacks, renew them at a price and continuously update them.

5. ***IT divide among countries:*** With increased reliance on computer technology in every state, the cost and labor involved are growing every day. The businesses and organizations have to spend a sizable amount of money on the latest hardware and software to protect against cyber crimes, and the IT professionals have to be trained intensively. In developing countries or less developed cities, literacy and education is not widespread and has led to an emergence of computer literate and computer non-literate. In a country like India, it was true of a language like English, but now the divide is more due to computer technology than anything else.

Jeff Relkin[4]in an article in Tech-Republic has raised few ethical issues confronting IT managers and relevant to the discussion here.[5]

1. ***Privacy: Does the availability of information justify its use?:*** For a variety of purposes, the governments collect a massive amount of data on individuals and organizations. The goals can be national security, tax collection, demographics, and strategic analysis. Various organizations do the same for commercial reasons like enhancing business, control expense, increase profitability, and grab market share. Should this collection and process of data be limited? Should the data be collected and processed if it means the violation of the right to privacy of individuals?

2. ***Privacy: To what extent effort and expense managers should incur in considering questions of data access and privacy?:*** It is one issue with both internal and external implications. Countries and organizations collect personal data of individuals. This data if not adequately safeguarded by organizations may result in significant negative consequences for individuals. Authorized personnel in an organization maintain such information like background data, compensation, and personal identification information. One can be sure about the security of the storage of this data, but at some point of time it leaves those secure systems and is used by others. What kind of responsibility would the storekeepers of such data have? There does not seem to be an ideal solution for this, but what could be the tipping point beyond which efforts to ensure data can be accessed only by those who are authorized to do so should be considered reasonable and appropriate?

3. ***Ownership: What can employers expect from employees concerning non-disclosure when going to work for another firm?:*** Quite many employees are required to sign NDAs (non-disclosure agreements) and non-competing clauses in employment agreements, legal documents that do not allow them to share information with other future employers. It can go to the extent of disallowing them to join certain companies or continue to take part in a particular industry. What about the others who have no such legal bindings? Working for employer A has access to many trade secrets, the technology of proprietary nature and other information which gives the employer a competitive edge. How can one do a brain-dump when going for employer B; that information is carried on. Is it ethical to use that specialized knowledge when changing employers?

4.Ownership: What percentage of an acquired information asset belongs to an organization and what component is part of an employee's general knowledge.

5.Control: Do employees have some knowledge of the degree to which their behavior is monitored?

6.Control: Does data gathered violate the privacy rights of the employees?

Some organizations do credit and background check to add to the normal reference check during the hiring process. Are the employees told about it and the results received?

[4] Jeff Relkin, ClO,Technology/Business Executive, Washington D.C. Metro Area. He has 30+ years of technology-based experience at several Fortune 500 corporations as a developer, consultant, and manager. He has also been an adjunct professor in the master's program at Manhattanville College. At present, he's the CIO of the Millennium Challenge Corporation (MCC), a federal government agency located in Washington, DC. The views expressed in this article do not necessarily represent the views of MCC or the United States of America.

[5] https://www.techrepublic.com/article/10-ethical-issues-confronting-it-managers/

7.Security: What reviews of systems should take place to avoid security breaches?

8.Security: What are the liability of managers and the organization when the system is compromised?

Can the owners of the system be held liable when security is breached? If the stored data is compromised, to what extent the liability of the victimized organization extends to the secondary victims, those whose information was stolen? Recently credit card data of several passengers were stolen from British Airways, affecting many individuals and companies. Many complexities brought about by the advancement of technology go well beyond the traditional issues of what is right and what is wrong. Technology is all about creating capabilities. Would old rules of general behavior still apply? There are no easy answers but also no scarcity of questions. There are several dilemmas when ethics is applied to Computer Technology. Jeff Relkin has listed such dilemmas in an article in the 'Tech Republic' published in 2006.

A. Who should have access to data? Can someone function efficiently without having such data?
B. Who is the owner of this data? Use of credit card, apart from the financial transaction, provides a glimpse of spending pattern. Is it the data of the cardholder or the company which suggests additional purchase by analyzing spending pattern?
C. Who is responsible for maintaining the accuracy and security of data? A lot of data flows in an organization. At which level the responsibility of accuracy of data should rest?
D. Does the collection of data for one purpose allow its use for another purpose?
E. Should the study of data patterns be used for preventing possible risks to employees or customers? Should manufacturers factor into the designs of their products any information regarding the harmful effects of the item manufactured?
F. How much of data collection necessary for decision making? At times the massive amount of data is collected not for present decision making but future marketing plan.
G. Should data 'follow' individuals? If the insured driver meets with a series of accidents and shifts his insurance policies, is it the ethical duty of the first insurer to notify the second insurer about the driver's driving skills? Should such data sharing be done?
H. If the data belongs to an individual and stored by an organization, should it charge for storage?

These are few dilemmas that cannot be addressed quickly.

Legal control over Information technology is not enough, unlike law or medicine. It should not only be "code-oriented" but also based on "self-oriented" morality. *Foucault*[6] finds no contradiction between individual freedom and moral values. Rather, they are complementary. *Christine Floyd*,[7] a computer scientist, suggests that scientists and engineers have to overcome silence-they have to speak about values. She further makes a distinction between what she calls "authority-mode" based on authority, hierarchy, law, command and obedience and "authenticity-mode" based on networks, choices, commitment, mutual support, and situations. Based on what *Christine* says, I have to add that the "authority-mode" is the hardware and "authenticity-mode" is the software, running the machine when ethics is applied to Information technology. Ethics seems to be a set of principles, codified or not, that should be followed by everyone, not only the IT professionals. Technology professionals in an organization need to develop a set of ethical guidelines so that the individual performance could improve and result in meeting the objectives of the company or an organization. *Harvard University* has a very well drafted "IT professional Code of conduct to Protect Electronic Information."[8] AS a *Harvard* IT staff, everyone receives communication and training on the Code of Conduct.

Measurement of Ethical Environment

There are ways to measure the ethical culture of an organization. Like *Harvard*, there should be clear, well-drafted Code of Conduct identifying statements that are clear by looking at the procedures and interaction with students, faculty, administration, and outsiders to assess its operation and acceptability. Third-party interviews to measure ethical environment in an organization are very helpful. All levels of the organization should be interviewed to understand their perspective better. The statements as contained in the code of conduct can be cross-checked through these interviews and measurement of the ethical environment in any company, organization or entity can take place. It can also be a graded system. The system of interviews providing tools for analysis to build a grading system can be created. It can be on a five-point scale, from "approbation" for the best adherence to IT code to "non-compliance" for violations of the IT code. Over time, the ethical code compliance can take place and organizations can be compared with others using this analysis. It can help the top management, providing them with a glimpse of the ethical culture of the organization.

Conclusion

Ethics in computer technology has become increasingly important. The normative aspects of IT should rest not only on "code-oriented" morality but also on "self-oriented" morality. The challenge to apply ethics in Computer Technology is high. Many well-drafted statements in the Code of Conduct, as is the case of IT organization of *Harvard University*, are the need of the hour. Companies, business entities, and organizations should use a mechanism for measuring their level of the ethical environment. A methodology based on external assessment through interviews, analyzing the response and awarding grades on a scale seems to be an excellent beginning for creating ethical benchmarks.

About the Author: Aniket Kumar Gupta is a student of Grade 12 (IBDP) at Singapore International School, Mumbai. He is passionate about computer technology and at an early age had devised a technological platform (Eshikayat.com) for grievance redress which is currently used by people in the villages of the state of Uttar Pradesh, India. Having learnt *Programming for Mobile Apps* at Stanford University in 2017, Aniket has learned *Data Science with Python* at Harvard University, USA in 2018. He created the School Mobile App for Singapore International School, and is used by faculty and students. He has to his credit one case study and a few scholarly articles published in International Journals.

[6] Foucault, Michel (1984): L'usage des plaisirs. Vol. 2. Paris: Gallimard

[7] Floyd, Christiane (1992): Human Questions in Computer Science. In: C. Floyd et al. (eds.): Software Development and Reality Construction. Berlin: Springer, 15-30.

[8] https://huit.harvard.edu

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