Module 6 Emerging Technologies

Lecture : 30

Course Title: Science, Technology and Society
Emerging Technologies

Sub themes : Information and Communication Society – Implications for Work, Social Relations, Governance and Control Biotechnology – Implications for the Meanings of Life and Life Processes, Application in Agriculture, Healthcare and Environment Discussion and Forum

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Sample Questions :

1) What is Information and Computer Technology ? Is it an emergent technology ?Is there any need for computer ethics ?
2) What is meant by an ' ethical turn ' in the contemporary time ? What could be a possible human face of some emerging technologies ? Give examples .
3) What is professionalism in applied ethics ? Is it a part of business ethics oonly?What is meant by engineering ethics ?
4) What is the threat of privacy and person in cyber ethics? Is there need to redefine what it is to be human in the context of genetic technology?
5) In genetic terms, what makes us human?Can we design humans ? What are its ethical implications?
6) What is genetic fatalism?How can one reconcile human freedom with genetic modification ?
7) " In the late twentieth century, social movements responsive to the movements for civil rights and women's rights developed wings specifically directed towards increasing access to health care, changing the quality care, and reforming the caring professions " .Do you agree with these statements ? Give reasons in support of your position.
8) Name some Contemporary Challenges that doctors and medical practioners face today due to technologisation of the body at all costs.Is there any scope for retaining subjectivity of the body and there by ethics in medical technology ? Write a note on medical ethics.

Emerging Technologies

By technology we do not mean only artifacts. Technology refers to human uses, patterns of activity, ways of doing things etc. while emerging technologies stand for further advances and innovations made during the contemporary period in various fields of technologies.We presently have available at remarkably low costs remarkably powerful artifacts: what will be emerging are their human uses and effects. From applications to emergence: we seek to provoke reflection on the human, educational effects of this transition. Considering computers as one of the emerging technologies we may bring cyber ethical concerns into the scope of our lecture on what will be its impact on our life style and thought style ?

What is ethics in a technological society? Are agency and responsibility solely ascribable to humans? Collste finds that despite the increasing attention of many philosophers and ethicists to AI, there continues to exist a fair amount of conceptual muddiness on the conditions for assigning agency and responsibility to such systems, from both legal and ethical perspectives. To quote Collste: "The uses of computers give rise to many moral problems: Is it morally wrong to copy computer programs? Some would say –it is to steal another's property. But –some would object –this protection of property rights will prevent the "have nots" ,i.e. those who lack the economic resources needed to get hold of the programes-and there are many such in today's world-to take advantage of the new technology. Which is more important: property rights or social equality?" Is it morally right to gain unauthorized access to information that governments or companies want to hide? Of course not –some would say –these agencies have the right to protect certain important information. But ------others might reply –isn't the free flow of scientific and political information without restrictions a necessary condition for an open[i] and democratic society? [1]1

Re visiting Ethics: Pure & Applied

To give a clear-cut answer is impossibility but we must re-visit the field of ethics in order to address such questions from computer ethics perspective. Ethics with theories of how to live is Normative. Save some interest in artifacts and the politics and design of technology STS has maintained a distance from the big issues of ethics. Even then there is some kind of an 'ethical turn' in technology .Computer ethics too can be potent political face in this direction

[1] . COLLSTE, G. (2000). "Ethical Aspects on Decision Support Systems in Diabetes Care" in Collste (ed.). *Ethics in the Age of Information Technology*. Studies in Applied Ethics series, v. 7. Linköping: bpt-TRYCK AB, 2000. Pp. 181-194.)

Although one can not ascertain what is the exact nature of this particular turn to ethics, is it ,"A Right turn? A Left turn? A wrong turn? A U-turn?, "for Nicholas Pagan at least, this much is certain that, **"**Ethics is back in literary studies, philosophy, and political theory. Where critiques of universal man and the autonomous human subject had, in recent years, produced a resistance to ethics in many fields of scholarship, today these critiques have generated a crossover among disciplines and led to theories and practices that see and do ethics otherwise. The de-centering of the subject, the contributors to this volume suggest, has brought about a re-centering of the ethical. Computer ethics is a part of this "contemporary turn to ethics" in literary theory, the humanities, challenging the legitimacy of the old order, "seeking emancipatory focus of life."[2]

While radical science movements have its focus on issues like nuclear disarmament, global way, ecological concerns, human genome projects, cloning and GM foods, animal rights, engineering disaster etc., & computers cyber culture, computer ethics and other branches of applied ethics tend more to professionalism (business ethics) .Accordingly, computer ethics, entitled as applied ethics, is mostly limited to applied technology/ a part of computing, software engineering.

In its attempt at understanding the overall impact of emerging technologies and their implications for work, social relations etc., one cannot but avoid asking questions about ethical implications of some professions like engineering, health sciences and other such disciplines that that have made tremendous impact on our life .However as a part of the larger movement of the ethical turn in literature and in philosophy, this ethical turn too is more focused on situational and context dependent ethical issues than focusing on explicit normative stances.

This leads to an awareness of distinctive nature of applied ethics in relation to distinctive professions. In engineering profession ethics is more akin to engineering design that needs technical efficacy of the job designed and implemented , on proper planning to avoid risks as far as possible than focusing on moral intuition or on guilt feeling etc.

Professional societies and ethics

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2. Nicholas Pagan, Spring 2002,"Editorial Review "of M.Garber and Rebecca L.Walkowitz authored *The Turn to Ethics* (CultureWork: A Book Series from the Center for Literacy and Cultural Studies at Harvard) in http://www.amazon.com/Turn-Ethics-CultureWork-Literacy-Cultural/dp/0415922267(accessed October 2010)

For example, if we look for ethics in engineering profession in order to ascribe moral responsibility for engineers for any moral and technical lapse on their part, we will have to take a different stand than that of a Kantian ethicist who will look for de-contextuiual moral obligations: all moral wrongs are categorically wrong and the moral agent could be solely responsible for the lapses whatever. Here, the nature of agency comes into question. More than a sole moral agent, the professional is understood as a part of a system or a co actor along with others.

Scholars in the field of engineering ethics have long recognized the complexity of engineering practice. Indeed, the central issue of engineering ethics might, arguably, be said to be figuring out how engineers can and should responsibly manage this complexity. STS theory is helpful to engineering ethicists precisely because it provides ways to understand, conceptualized, and theorize this complexity. Framing the product and processes of engineering as sociotechnical systems makes visible the ways in which they are both combinations of technical and social components. As the complexities of engineering practice come into clearer focus by means of STS concepts and theories, there is better focus on the complexities of engineering practice and its diverse nature.

Focusing on two STS ideas – that of the co-production of technology and society and that of sociotechnical systems – and by showing that they have important implications for understanding the responsibilities of engineers, Deborah G. Johnson and Jameson M. Wetmore have come to a conclusion that although the analysis seems to point to a weaker account of the engineers insofar as it shows that many other actors are involve in the production of sociotechnical systems, it provides a picture of engineering practice in which engineers are seen to be doing more than designing neutral devices. Indeed, engineers are shown to be (with others) building the world in which we all live, a sociotechnical world. The analysis does more than merely deny the isolation of engineers; we use the STS co-production thesis and the notion of sociotechnical systems to develop a picture of the products and processes of engineering.

Their analysis suggests the importance of engineers as a team considering the ways in which their designs will influence values, politics, and relationships, while simultaneously recognizing, responding to, and helping shape the wide variety of actors that impact the design, use, and meaning of technology.

Challenge from technology: need for ethics in professions

Engineering professional societies first proposed codes of ethics in the nineteenth century, but it seems fair to say that the field of engineering ethics in the United States largely developed during the second half of the twentieth century in response to increasing concern about the dangers of technology. A sequence of events starting with use of the atomic bomb in World War II, continuing with the Three Mile Island disaster, the Ford Pinto case, and the explosion at Bhopal, generated a significant concern in the media and the public about the effects of technology on human well-being. After decades of seemingly unmitigated praise, many Americans began to wonder if technology wasn't

"biting back and making us pay (in negative consequence) for the improvements it had provided."

In response to this need, by the early 1980s, an academic field that has come to be known as "engineering ethics" had begun to form. It has built by scholars and practitioners from many different fields including philosophy, history, law, and engineering. Despite their varied backgrounds, however, most believed that concepts and theories from philosophical ethics could be useful in understanding the circumstances of engineers and assist them in making decisions in the face of difficult situations.

Scholars building the field of engineering ethics contended that ethical theory and training in ethics would allow engineers to see the ethical aspects of their circumstances and help them identify the right choice and course of action with rigor and justification rather than with "gut" feeling or intuition. Like the other emerging fields of applied ethics, they saw a dose of ethical theory as a promising antidote for the temptations and pressures of the workplace. Thus, a significant part of the field of engineering ethics was dedicated to applying philosophical concepts and theories such as Kant's categorical imperative, utilitarianism, and distributive justice to issues faced by engineers. This approach was in part inspired by the newly developing fields of medical ethics and bioethics.

Specially in the field of engineering ethics, a major concern of the field was to identify the ethical issues, problem, and dilemmas that engineers commonly face in their careers. In large part because the traditional subjects of moral theory and moral analysis are institutional arrangements and social relationships, scholars looked to the organizational context of engineering and the social relationship that constitute engineering practice. Through this lens, the importance of the business context in which engineering is practiced was most salient. Scholars in the field typically portrayed the engineer as an ethical actor who had to make complicate decisions within the institutional arrangements of a corporation. The business environment was most commonly illustrated with case studies that focused on the description and analysis of disasters such as the Ford Pinto fuel tank explosions, the crashes (and near crashes) of DC-10 passenger jets, and the Bhopal chemical leak.

These case studies emphasized that individual engineers had to medicate their technical knowledge with institutional pressures, the demands of their employers, their professional codes of ethics, and the expectation that they protect the public. If an engineer mismanaged these demands, the results could be disastrous. Indeed, much of the literate of the 1980s and early 1990s can be seen as digesting the implications of engineering being practiced in the context of business interests. This emphasis can be seen in Kline's summary of the major issues that form the core of engineering ethics texts in the United States, which largely focuses on business-related interests including conflicts of interest, whistle-blowing, trade secrets, and accepting gifts (Kline, 2001-2: 16).

Numerous case studies were developed that asked engineers to consider how they would act when confronted by a dilemma wherein a business interest came into conflict with the public good or some sort of professional norm. "To be sure, the filed of engineering ethics was not and never has been monolithic but has been largely concerned with the social circumstances of engineers and field have appropriately focused on disaster, unsafe products, and dangers to human health and well-being.

Information and Communication Society – Implications for Work, Social Relations, Governance and Control: Ethics in Cyberspace

In the early days of AI, Weizenbaum warned us against giving machines the responsibility for making genuinely human choices. Computer Power and Human Reason raised questions about the role of artificial intelligence and spurred debate about how man relies on technology in order to escape the burden of acting as an independent agent, and in deciding and pursuing what is truly valuable. These issues are becoming more and more urgent as technologies converge and become increasingly embedded and integrated in all facets of our lives. Cooley (2007) points out that technology in its multi-various forms is rapidly becoming all-pervasive. It permeates just about every aspect of what we do and what we are. It ranges from the gigantic, the diversion of rivers and the repositioning of mountains, to the microscopic level of genetic engineering. Science fiction becomes reality as faces are transplanted and head transplants are confidently predicted. In the age of mediating technologies, the spirit of Weizenbaum's ELIZA (1976) seems to be alive and well today when we observe proponents of pervasive and streaming technologies, including policy makers, managers and researchers, becoming increasingly seduced by the possibilities of mechanizing institutional and organizational functions and processes in the name of competitiveness, security, transparency and accountability.