

Lecture: 22

Course Title: Science, Technology and Society

Technology shaping society

What is progress and development that is essentially sought for? Is the positive value of technology built into the very meaning of the term technology? We generally do equate technological innovation and growth in the gross national product (GNP) with human progress.

Do we always have technical solutions to our problems? That genetic and bio-engineering will create new agricultural products and new forms of livestock (through cloning) that will solve the problem of food distribution and availability; the universal use of computers and the Internet in schools will solve the educational crisis as well as increase worker productivity; the harvesting of rare tropical plants will lead to the development of pharmaceutical drugs to cure human diseases; the human genome project will prevent diseases before they begin; new forms of technology –nuclear and solar power, cold fusion-will ease our dependence on a slowly vanishing supply of oil and natural gas; improvement in telecommunications will increase human fertility and happiness. The list goes on and on as well as the new technologies increase material wealth and human freedom, while they decrease poverty, disease and all other obstacles to human well-being.⁴⁸

Philosophy of science and technology

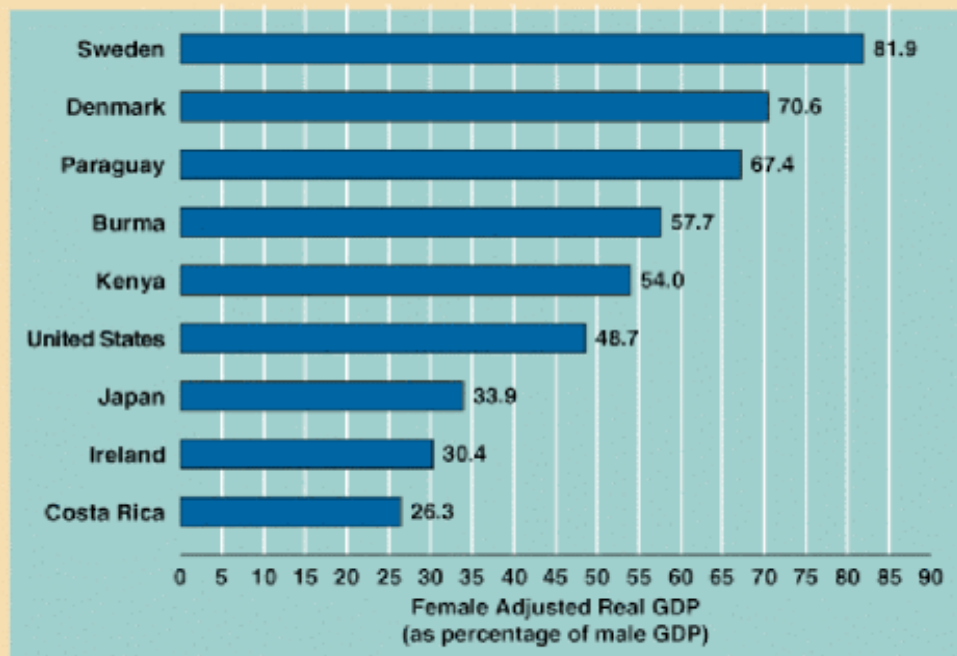
For the upholders of technological determinism morality appears to be an out of date concept to be swept aside as irrelevant. While video game publishers unethically train children in the use of weapons and, more importantly, harden them emotionally to the act of murder, cyberpunk novel Neuromancer paints a very unfeeling, uncaring future cyborg/robotic/technicist world. Technological determinism goes hand in hand with a liberal political position which is highly problematic in relation to gender. Many of the cultures and communities which are springing up in relation to the Internet and other ICTs have a liberal basis. These lead to expressions of equality which are far from equal as they deny real differences amongst people.(Collingridge,1980). In addition, freedom of speech can be extremely problematic if it becomes a freedom for others to be harassed or opposed. The freedoms espoused by some Internet communities can lead to forms of libertarianism. These communities can be vociferous in allowing their members freedom at all cost, but at the expense of the chance of others to speak.

Philosophy of science and technology

The Gender question in science and technology

- In studies of gender and technology, and particularly gender and computing or IT, initially, much work focused on the proportion of men and women in the subject. But there is still a strong interest in women's poor representation in the industry especially at senior levels. There are a greater number of woman working today but they are paid less. There is a glass ceiling that prohibits woman from reaching executive office.
- Gender discrimination

Gender Income Disparities in Selected Developing and Developed Countries



Source: Compiled from data in United Nations Development Program, *Human Development Report 1993* Technical Note Table I.1.

Philosophy of science and technology

The question is how far can science cope with the issues of diversity? Following the first nuclear explosion, Albert Einstein commented that “the unleashed power of the atom has changed everything save our mode of thinking; thus we drift away toward catastrophe.” The scientific perspective of Karl Popper and Polyani considered science as

the substitute force of the liberal imagination, a falsification thesis that ensures intellectual humility and flexibility.

Thomas Kuhn observed that all science needs is a paradigm shift, if it is the need of the hour, the style of thinking that characterizes scientific prestige of the time, a scientific community feels comfortable with a particular paradigm till there is a crisis situation or a revolutionary break with the previous paradigm.”..that gas chambers of Auschwitz and Treblinka were ultimately prepared, not in some ministry or other in Berlin, but at the desks and lecture halls of nihilistic scientists and philosophers.”⁴⁹

Is there anything here that we can talk about meaningfully that will be a response to all these questions raised here?

Technology shaping society : need for restoring the human roots of science and technology :

A Phenomenological Approach

Does technology shape society or society shape technology, or both shape each other? What is the nature of this shaping? Is it in practices, in ways of thinking, or is it more fundamental? The answers to these questions will obviously influence the judgments we make about the social and ethical implications of information technology when we consider the policy and practical concerns of using information technology in a particular domain (such as commerce, education or government). Obviously many different ontological positions are possible and have emerged. Nevertheless, it may be useful for the purposes of this entry to discern at least three contrasting and prevailing views. In order to understand the distinctiveness of the phenomenological approach some other possible ways of interpreting this relationship will also be outlined briefly. It might be useful to further clarify some of the contrasts that the entry tried to suggest as useful in understanding the distinctiveness of the phenomenological approach.

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The term ‘phenomenology’ is often used to cover a wide family of related approaches that share some common characteristics but not all. Nonetheless, there are various examples of how phenomenological resources have been used to understand technology. One might claim that all of these phenomenological studies share at least the underlying view that technology and society co-constitute each other by being each other's reciprocal and ongoing condition or possibility for being what they are. As such they continually draw on each other for their ongoing sense or meaning. Probably the most famous phenomenological analysis of technology—or rather the technological attitude that gives rise to artifacts—is Martin Heidegger's (1977) essay ‘The Question Concerning Technology’. This essay is important as a reference point because it illustrates forcefully the most important and distinctive claim of phenomenology vis-à-vis technology. Technology is not merely an artifact or our relationship with this or that artifact; rather, the artifact—and our relationship with it—is already an outcome of a particular

‘technological’ way of seeing and conducting ourselves in and towards the world. Heidegger (1977) famously claimed that “the essence of technology is nothing technological” .

Before we explore further Heideggerian approach to science, technology and life world we have to understand the basic requirements for phenomenology as discussed in Edmund Husserl.

Technology shaping society : need for restoring the human roots of science and technology

Approach or view	View of technology / society relationship	Approach to ethical implications of technology
Artifact / tool	Technologies are tools that society draws upon to do certain things it would not otherwise be able to do. When tools become incorporated in practices it tends to have a more or less determinable impact on those practices.	The task of ethics is to analyze the impact of technology on practices by applying existing or new moral theories to construct guidelines or policies that will ‘correct’ the injustices or infringements of rights caused by the implementation and use of the particular technology.

Technology shaping society : need for restoring the human roots of science and technology

Approach or view	View of technology / society relationship	Approach to ethical implications of technology
Social Constructivist	Technology and society co-construct each other from the start. There is an ongoing interplay between the social practices and the technological artifacts (both in its design and in its use). This ongoing interplay means that technological artifacts and human practices become embedded in a multiplicity of ways that are mostly not determinable in any significant way.	The task of ethics is to be actively involved in disclosing the assumptions, values and interests being ‘built into’ the design, implementation and use of the technology. The task of ethics is not to prescribe policies or corrective action but to continue to open the ‘black box’ for scrutiny and ethical consideration and deliberation.

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Approach or view : Phenomenological	View of technology / society relationship	Approach to ethical implications of technology
Technology and society co-constitute each other. They are each other's condition of possibility to be. Technology is not the artifact alone it is also the technological attitude or disposition that made the artifact appear as meaningful and necessary in the first instance. However, once in existence artifacts and the disposition that made them meaningful also discloses the world beyond the mere presence of the artifacts.		The task of ethics is to point back to the attitudes and moods that made particular technologies show up as meaningful and necessary. It seeks to interrogate these assumptions and attitudes so as to problematize our ongoing relationship with technology.

Technology shaping society : need for restoring the human roots of science and technology**Bridging science, technology and value : phenomenology of Life World**

The term phenomenology has a long history of its use. Husserl's early use of the term phenomenology was either anticipated or inadequately interpreted at about the same time by the American philosopher, C.S. Peirce, who also used the term *phaneroscopy*. Still, the discipline of phenomenology, its roots tracing back through the centuries, came to full flower in Husserl. Phenomenology as we know it, was launched by Edmund Husserl in his *Logical Investigations* (1900-01). So we can begin with Edmund Husserl, and the phenomenological movement, understanding it as the philosophical tradition launched in the first half of the 20th century by Edmund Husserl, Martin Heidegger, Maurice Merleau-Ponty, Jean-Paul Sartre, among others. The central figure of this movement, Edmund Husserl (1859-1938), began his academic career as a mathematician. German philosopher Fredric Paulsen is largely responsible for creating in Husserl deep passion for philosophy, a subject that possessed him completely and kept him engaged all his life. His deep commitment to the subject ultimately culminated in his ambitious project of transforming philosophy into an exact science.

Phenomenology of science,technology and its human roots

Since the *Logical Investigations*, Husserl was convinced of the fact that the sciences, in their positivity, have ignored the discovery of their hidden pre suppositions. Edmund Husserl, who was a mathematician and philosopher by training, had better tools to articulate the philosophical implications of a mathematization of existence. By the time he wrote *The Crisis of European Sciences* (1954/1970), at the end of his life, he had seen first hand the devastation technology had wrought and had witnessed the moral bankruptcy of the scientific, political, and religious institutions of his time. Instead of the unlimited progress that the natural sciences had promised, Western culture found itself in a “radical life crisis of European humanity,”(CES 2)with the sciences the handmaidens of totalitarian regimes justifying genocide and building the next generations of weapons of mass destruction.”⁵⁰

Husserl begins by admitting that it seems paradoxical to speak about a crisis in science. “Its achievements are unmistakable, its labors in endless fields continue apace, what unsolved problems there may be will be solved either by existing methods or by development of further methods, and the development of further methods will occur just as the developments of the methods of the past occurred”.⁵¹

Phenomenology of science,technology and its human roots

Still, he says, the need of new methods can be discovered only by a critical survey. Despite its promises science has failed to bridge the gap between the mathematization of the natural world and the ensuing loss of the qualitative dimension of human existence. The classical idea of a universal philosophy, which can encompass all fields of knowledge, has been replaced since Galileo by a belief in mathematics as the universal Science (Husserl, 1970). This has also resulted in a dichotomy of two worlds: between the human world of love and poetry, and the world of electrons. Husserl’s challenge to the Galilean/Cartesian application of mathematics to all areas of life comes out of an in depth studies of mathematics and its philosophical history.” Galileo, looking through his telescope, recognized that the movement of the planets could be represented by mathematical symbols. Descartes elaborated this idea by defining that all things are “res extensa,” things of extension, which can be described mathematically. The idealized plane of geometry with its pure forms is extended to include the sensory world we experience, and the results are exciting and lead to great progress in the natural sciences and technology. But they are also devastating.

Phenomenology of science,technology and its human roots

Descartes *scientia mirabilis*, his miraculous mathematical science, opens up wonderful avenues for scientific exploration and technological invention; but large areas of scientific inquiry are excluded because they cannot be captured by mathematics”. Husserl continues: “ In Galileo, we see already how the mathematically structured world of idealities is pushed upon us as the real and is substituted for our lived world. The

mathematical “garb of symbols” (CES 51), which is only a method, is taken for true being.” “...a room is no longer my office cluttered with the books, pictures, papers, and artifacts of my life, but a cube 8x12x10 in dimension, the same as all the other cubes down the hallway.

Geometry captures the quantitative aspect of a space, but the qualitative element cannot be expressed in mathematical symbols.”⁵³ But the fact remains that the really basic world is not the scientific or philosophic but the popular world, the Lifeworld. The ultimate evidence for scientific procedure lies in this Lebenswelt. ”When Michelson and Morley perform an experiment what they see is one thing but what they say is another. The world of science is rested on the popular world and on popular notions that the scientist cannot criticize using concepts that he sees with but cannot say.”⁵²