

E-Transformations of Societies

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INTRODUCTION

Not all transformations of societies are caused by technology or are technology-driven. However, it is evident that technology is an important driving force of societal changes. To state that technology—both contemporarily and historically—largely shapes the form of societies does not necessarily mean the acceptance of technological determinism (as the philosophical approach). It can be viewed just as a statement concerning the hard facts.

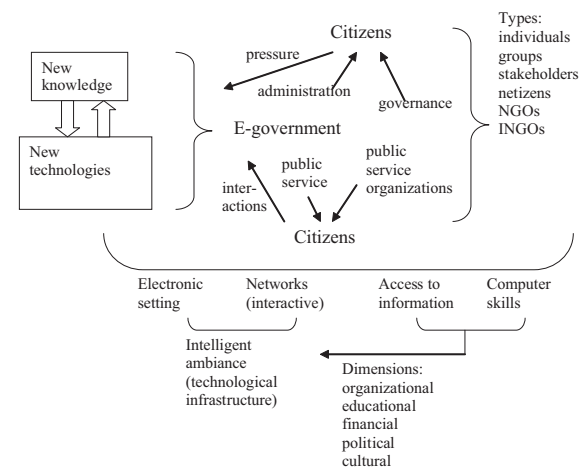
In the 20th century the rapid development of technology marked a new era. In order to describe and interpret this situation several new terms have been coined, as well as concepts and theories. Usually they underline the revolutionary character of technological change. In 1939, Bernal coined the term “scientific and technological revolution”, which meant the joint effects of revolutions in science and in technology and their feedbacks. More than two decades later Kuhn (1962) developed and popularized his paradigmatic view of science and its revolutionary breakthroughs. It is needless to add that there are close—and to great extent causal—relations between science and technology.

As a result of thinking in terms of scientific and technological revolutions or paradigms there was a tendency to use them in the theory of social change. In the late 1960s and 1970s some attempts were made within the Marxist theoretical orientation (Feenberg, 1991) to create an overarching theory of scientific and technological revolution including social change (e.g., Richta—see Zacher, 1995). Western theoreticians, having more experience with high tech and its practical impacts, were describing them using somewhat different nomenclature Ackoff (1974), Brzezinski (1970), and Masuda (1981) preferred cybernetic revolution, the Age of Systems, the Information Era, the Technetronic Era, the electronics revolution (also called the microelectronics or microprocessor revolution), the computer revolution, the information revolution, and the like (Friedrichs & Schaff, 1982; Forester, 1984). With reference to science and technology such terms as *materials revolution* and *biological* (or *biotechnological*) revolution were also in use. Somewhat later a new term arrived, *Internet revolution*.

BACKGROUND ON METHODOLOGICAL APPROACH TO E-TRANSFORMATIONAL DISCOURSE

E-transformation of anything (civilization, economy, society, government, democracy, world, etc.) refers literally to electronics as a scientific discipline, technologies, industries, and their multifaceted impacts. Thus, this reference marks out the period of time when electronics appeared, was developed and used *de facto* in all spheres and sectors of human activity and life. So electronics became the basic technology of our time. That is why it is possible to use its name as a label for a civilization, an era, a revolution, societies, a world, etc. Also, electronics can be used metaphorically as a name tag when we speak of the information sector, high tech, ICTs, media, computers, networks, future forms of societal organization or disintegration like e-herd, intelligent mobs, human swarm, human aggregations, posthuman mixed teams, and so forth. Of course, one can assume that knowledge potential-building under any form of human organization (also individual, group, societal, global) will be to a great extent electronically aided. So e-transformations should be debated in a broad context and in a broad sense. A general conceptual model is presented in Figure 1.

Figure 1. E-transformations in the context of e-government: A conceptual model



Naming Civilizations and Societies

To the aforementioned terms some sociopolitical, in contrast to civilizational, dimensions were assigned. The new names characterizing the emerging nature of advanced societies were coined, for example, *cybernetic society*, *information society*, *computer society*, *telematic society*, and also *bio-society* and *bio-info-society*. It is worth adding that at the same time as some prominent authors wrote about scientific and technological civilization on information civilization, such terms as *postindustrial era* and *society*, *postindustrialism*, and the *Third Wave* were popularized widely by Bell (1976) and Toffler (1981, 1990, 1995).

Interestingly in the sphere of *ideology* there were some attempts in the former Communist Soviet Union and Eastern Europe to introduce such new terms as *developed socialism*, which became bankrupt in the meantime, in turn. In the West, some terms emerged like *post-capitalist society* (Drucker, 1993), and also in the longer term perspective, *posthuman society*. There were also texts on the postmarket era, on the postmaterial era, and on the postintellectual era. There were also some “end-isms”, for example, Fukuyama’s (1992) the *End of History*.

Of course some of these notions or concepts were merely fashionable expressions or spectacular slogans in media debates. However, in many ways their abundance reflected the actual or expected phenomena, as well as new social forms and deep transformations.

It is possible to gather the new features and differences of civilizations and societies and to relate them to the dominant type of knowledge and type of research (discipline).

Table 1. Types of civilizations vs. types of knowledge/research

Type of civilization	Main type of knowledge/research (discipline)
Technological (or scientific and technological civilization)	Scientific and technological knowledge Basic research nuclear physics, new engineering, new materials, computer engineering
Post-industrialism	techno-service services new organization
Technetronic era	electronics new weapons
Information civilization (Information Era)	information theory informatics Web theory network analysis
Third Wave Civilization	forecasting future studies foresight
Systems Age	systems theory cybernetics complexity theory
Computer Age	computer science modeling simulations
Postmodernism (Postmodernist Era)	catastrophes theory risk theory chaos theory chaotics analysis
Posthumanism (Posthuman Era)	artificial intelligence robotization cyborgization genetic engineering new ethics

This typology of civilizations or eras only considers the examples most frequently appearing in recent decades. Many names can be assigned to them like Bernal (1939), Richta (1971), Ackoff (1974), Bell (2001), Toffler (1981, 1990, 1995), Brzezinski (1970), McLuhan (1964), Dizard (1982), Castells (2001), Masuda (1981), Negroponte (1996), Dertouzos (1998), and Lyotard (1986). However our assessment is made from a current perspective and is somewhat arbitrary.

What is common or characteristic in this typology? It seems that in spite of the significant diversity of characteristic features there are rather evident references to knowledge, to its growth stimulated by scientific discoveries and new breakthrough technologies, and to new theoretical approaches (or even *Weltanschauung*) to the growing “artificialization” of man. So altogether it is the growth and accumulation of knowledge and its ever new, radical, and wide applications accompanied by progressive human inventions, skills, and competencies which count here. All this was linked, at least from a certain moment, not only to human “cognitive hunger” but also to profit making and the consumption drive. Anyway, a cybernetic model of learning could probably be the most appropriate way to reflect this situation. Of course, the prospective orientation is immanently built into the model.

Knowledge was the foundation of practically every stage or period of civilizational development. At the beginning it was nonscientific knowledge, then, scientific or science-based knowledge. Of course, its level, its growth, its ways and the methods of its “production”, proportions of its types, diversity of its fields and ways and speed of its utilization and its management have impacted the pace and type of progress throughout the history of mankind.

Historically, the shaping of people’s consciousness had a revolutionary character in which the role and significance of science in development, apart from such things as magic, imagination, fate, the invisible hand of the market, randomness, chaos, as well as the possibility of active building of knowledge potential were immanent and fundamental. Human proactivity in building such a potential is expressed in the creation of knowledge *per se*, in inventing new ways of doing things, in imaginatively applying it, finally, in managing it to the extent which is possible and reasonable (Halal, 1998; Hodgson, 2000). The process of knowledge potential building is performed at all levels of governance, politics, and management; and all actors, government, business, and civil society should be involved. Moreover this process is more and more transnational, international, and global. The result is global knowledge potential, unequally contributed and unequally utilized by nations. However a positive understanding of the role of science and research is not common everywhere. It is dominant in the highly advanced coun-

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