Chapter 3
Technologization of Man and Marketization of His Activities and Culture of the Future

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Abstract Technologization of man and human activities has a long history. The industrial revolution of the eighteenth century and the scientific and technological revolution of the twentieth century accelerated this process. Its present forms as the information revolution, biorevolution, and nanorevolution created a new reality. However, technology has been a subject of increasing commercialization and marketization what has a detrimental influence on culture. Dominating (also in the cyberspace) the mass pop culture is oriented mostly to entertainment and consumption of technological gadgets. Could this trend be modified or reoriented? Anyway the complex relations and interactions of technology and culture should be investigated in an interdisciplinary and systemic way which can be instrumental for positive actions and changes.

Keywords Technologization · Commercialization · Marketization · Mass pop culture · Entertainment · Consumption

Technologization of man and his activities has been progressing since the beginning of the human civilization. The industrial revolution of the eighteenth century and the scientific and technological revolution of the twentieth century have made this process even accelerated. Its present form is the information revolution and the new social space, i.e., cyberspace. Technology nowadays is a subject of increasing commercialization and marketization what has a significant influence on its "shape." Technology is a creation of men and their cultures, however, not rarely, is dominating and impacting culture, its development, directions, and products. Mutual relations of technology and culture are very complex and multidimensional. Their future is hard to predict.

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Premises of Technologization

Technologization of man and his environment and his activities is a long process occurring at the dawn of the human civilization. Basically, it can be treated as historically evolutionary process, however, with some discontinuities which were connected with technological breakthroughs. The eighteenth century was the beginning of the industrial revolution, which introduced many novelties such as massification of production, its machinization, new types of power generation, and also new skills and competencies of people (workers, technicians, managers). The twentieth century was proclaimed—by J. D. Bernal—the era of the scientific and technological revolution. This revolution overlapped to some extent previous industrial advances. However, its basis was funded on scientification of technology, dynamic development of research and education, diffusion of scientific thinking, and technological rationality. So the end of the twentieth century and the beginning of twenty-first century was a time of domination of new directions (or "developmental channels") of this revolution—from plastics to composites and then to the information revolution and biotechnological revolution and, still in its embryonic state, the nanotechnological revolution. These revolutions created a new—rather artificial—environment for humans and their life, not to mention that they changed the man himself. The transformed environment is not only artificial but also—thanks to technology—intelligent. In spite of the fact that these revolutionary processes were performed by societies—by their scientific investigations, innovations, and their applications, by institutions and organizations, strategies, and policies, and by their behavior, attitudes, and imaginations—their results were only partially planned, desirable, expected, and positive. These revolutions generated serious risks, dangers, and negative side effects (immediate or long term). However, they proved also a great *transformative ability* practically in all domains of people's life. Moreover, they transformed the people themselves, which were their creators and agents of technological change. Radical in scale and depth, transformations occurred in the R & D sphere, education, industry and services, medicine, management, and also in institutions and organizations, in people's consciousness, their imagination, lifestyles, behavior, politics, and culture (not solely technological), as well as in media, entertainment, sport, and last but not least in the military sphere.

Technologization of people was growing and making useful—in scientific discourse—such terms as *technological man*, *technological civilization*, and *technological culture* (technopoly). In the present period of technological development, it seems that important role is played by the information revolution (which is also called the computer, microprocessor, telematic, and digital one). Its effects are expressed as informalization and networking of the human world. Moreover, this revolution generated a new—an additional—social space: cyberspace. So the space of human functioning was enlarged and became practically borderless; communication became immediate, *online*, and interactive. Cyberspace means to at least some extent a separatedness and voluntary—or not—exclusion. Any way a

territory or rather space available for man (as a symbol of *homo sapiens*, not in meaning of sex or gender) and his functioning was fundamentally enlarged. So the world of people became significantly technologized and (virtually) enlarged and at the same time more complicated and complex, also very differentiated (various gaps, recently—digital divide) and diverse (that is why we use the term *civilization of diversity* as opposed to formerly expected universalistic civilization). Differentiation, variety, and diversity are expressed not only in a form of multi-level and multitrajectory development (what seems somewhat natural since the so-called take-off moment of the development of countries was historically and geographically uneven, as well as its pace and directions), but also in diversity of its positive and negative effects and impacts generated by technology. These effects were determined not only by technology per se, but rather were dependent on a *cultural ability* to create technology and use it in practice.

Globalization is a significant dimension of development of technology and its overwhelming influence. Globalization as a visible process begun from Columbus and attained its climax at present—thanks to new means of transportation (ships, airplanes, transcontinental trains, etc.) and telecommunications and media (telephones, radio and TV, cables, satellites, the Internet). Global mediatization and the global auditorium enable a hegemonization of cultural influence and imposition of life patterns (Westernization, Americanization). However, such a situation can change in the multi- or post-polar world, in which the so-called new powers (as China or India) find their proper place. So hegemonism can be weaker, while multiculturalism becomes meaningful and stronger. Moreover, the "inner structure" of globalization may be heavily impacted by racial and religious changes, not to mention the growing pressure from the part of non-Western immigration. Do some pose the question whether the "Christian, Western culture of the white man" will be dislodged by the culture of Islam, by Asiatic and African natives, and whether "clashes of civilizations" (to recall Huntington) will be intensified and more dangerous? Do the new powers become not only the new poles of growth, but also new centers of advanced technologies?

Overcoming the Misleading Generalizations

Generalizations concerning technology happen to be misleading. Technology is globalized now, but it does not mean that all countries, societies, or companies have the same technology, on the same level, equally modern and efficient and that they all can develop a *high-tech economy* based on *cutting-edge* technologies. Access and performance have many limitations. Many factors and favorable conditions are necessary—for example, aspirations, competences, technological culture, skilled workforce, markets, and of course capital. It was not commonly understood by politicians, aid organizations, Western companies, and even scientists. E. F. Schumacher a few decades ago had tried to change such thinking and policies, introducing such terms and concepts as *intermediate technology* and

appropriate technology. Recently, similar ideas were stimulated by the movement called Critical Technical Practice, often in the context of such programs as Information Communication Technologies for Development (ICT4D) and One Laptop Per Child (OLPC). However, the mainstream thinking on technology, its design, transfer, and applications was determined through decades by the world leaders and their scientific communities. So, a high-tech narrative is now predominant, technological progress is considered a goal, technology becomes an idol, and societies' goal becomes to achieve high productivity, military power, and regional hegemony. Such ideology drives technology transfer and the arms race even in poor societies at the expense of other goals.

So the world scientific and technological leaders (often based on network cooperation and brain drain) create novelties that require usually expensive and long-term research, while the rest of the world should modernize itself as much as possible using such means as foreign capital inflow (FDI, joint ventures), technology import, imitation of development and consumption patterns, technical cooperation, and so on. Nowadays, modernization is costly, and economic, organizational, and personnel requirements are difficult to fulfill. These who are delayed (backward) have to rely on transfer of technology, knowledge, and skills. Sometimes the latecomer's chance emerges, and the latecomer is able to "jump over" some levels of technology (China tried to do it, but the first time failed; at present, seems successful). However, the price is high and its negative side effect is *technological dualization* of economy and people's lives. Anyway modernization narrative aims at de facto all countries—less developed, transitional economies (for example, new members of EU), and even leading countries where there are usually some neglected areas or types of economic activity that are delayed or obsolete. Technical modernization has, of course, its political and cultural dimensions.

Co-evolution of technological systems and social systems—actually the latter seems predominant—determines the trend of change. However, in the very differentiated world, there is in fact multilevel and multitrajectory development of technology and its applications, effects, and impacts as well. It is so in spite of all systems–network linkages in research, innovations, strategies and policies, and implementation activities. Diversity remains since conditions and abilities vary. Science and research are *drivers* of technology development. Creativity is oriented not really on human needs (needs and desires are now created, often artificially by marketing, fashion, ads), but on generation of demand, on facilitation of human life, on cumulating gadgets, and on making customers dependent. So such a creativity strongly connected with the market enables meeting people's real and artificial needs and obtaining profit at the same time (quite often government takes risk, if an expected result is not certain; there are also government orders, tax reductions, etc.). But culture—broadly understood—remains a condition, limitation, also a stimulus and favorable context of the co-evolution of technological and social systems and of creativity.

Technology and Culture

Culture—in necessary feedback with technology—also is being technologized and industrialized up to the stage of the so-called technopoly (to recall Postman), which means technology domination over culture. Quite frequent theoretical division between civilization as material potential of humanity and culture as immaterial (symbolic, spiritual) looses its explanatory power. Technology, various technologies create new possibilities for culture, they determine significantly its directions, its "products" and its social assimilation, its emotional perception, not to mention diffusion, possibilities of reception (not possible without technical devices—such as a radio and TV set, video, mp3, movie apparatus, home movie). The creation of various "cultural products" is now not possible without photograph and film cameras, recording devices, light systems, computers, and also studios. Taking into consideration the so-called cyber-culture shows that border between technology and culture—in many of its dimensions—is more and more fuzzy. In the long-term perspectives of trans- and post-humanism, we can expect the emergence of a new entirely technical culture. Such culture created and performed by machines, computers, and culture could be then called a *post-culture*, a form possible thanks to historical trends (technologization, virtualization) and to new practices of artificial intelligence, automata, man-machine systems, robots, and cyborgs that are quite imaginable.

For the time being, culture is significantly supported—in its expression and access—by technology. Thanks to media, especially electronic, the contemporary "products" of culture reach the global auditorium. Audio and video productions and their diffusion would not be possible at all without technology. Present fascination with pictorial forms of culture and communication ("pictorial civilization") drives transformations of *homo sapiens* to *homo videns* (to use G. Sartori's term—Sartori 1999). Pictorial bias is responsible for underestimation of the "audio element." Therefore, sounds of music attack us from everywhere—in hotels, in railway stations, in the supermarket, in the car and airplane, and while walking (young people have earphones in their ears almost permanently). Music is present in film productions, theater performances, and operas and music halls, not to mention street musicians and noisy neighbors listening to music or dancing. Music recording, CDs, stereo systems, and music players constitute a large, profitable industry. Music piracy and bootleg music CDs are now technically easy. Anyway sound is still fundamental, and technology makes it happen—its generating (i.e., electronic music) and amplifying (amplifiers are at present a must for pop music stars performing for very big audiences as in the case of Michel Jarre or Elton John who use complicated electronic devices and lasers). Live rock or pop concerts nowadays have audiences of a million or more listeners. Such a scale was never possible before the ICT revolution. On the Internet, sound and picture are intertwined and complementary. Such pop stars as Lady Gaga and Justin Bieber have more than a billion views on YouTube.

Man is multisensoric; however, a sense of sight seems the most important. Probably that is why technology development is going in the direction of screen, visualization, pictoriality, and iconic presentation. *Homo videns* likes visual expression and spectacles. It was noticed by G. Debord when he wrote on "society of spectacle," and by E. Goffman when he used "theatre of life" as an important metaphor useful to describe social behavior. Immense mass spectacles are more frequent now—the bigger the spectacle, the bigger the profit. They are transmitted by media additionally. In some sense, tournaments of computer games or other Internet events can be treated as mass events. Contemporary culture is more and more close to entertainment and becomes mass and popular in its nature. It is evident that such characteristics as feedback drive technologies and profitable business practices are useful and functional to this end. That is why we talk about business of culture and culture industries as the music industry, media industry, audiovisual industry, publishing industry, computer games industry, industry of mass events as festivals, museum exhibitions, entertainment parks, etc. These industries—important for youth, for digital natives—function both in real life and virtual life. Hypertext, multimedia, and hyperreality are new technical means and new spaces generated by ICTs.

Mass production, inexpensiveness, and access to culture (and entertainment often connected with it) construct its specific "structure." In the past culture, in particular the so-called high culture, its creation and consumption were mostly a domain of elites (aristocratic, intelligentsia, of persons educated and having their own generational cultural heritage). At present, the situation is different—technologization, dissemination among the masses, and price moderation—all due to market competition and the dominant development trajectory toward *market society* (which profile is increasingly consumption—entertainment) cause upward movement of not culturally refined vast masses (or "the people masses" as it was called sometimes). So the most accessible and common type of culture is a primitive culture or plebeian pop culture, which is increasingly commercialized and light and often amateurish. Such a type of culture is now in demand on a large scale. It does not require any particular theoretical knowledge, competences, refined taste, and skills of wise selection of offers of cultural industries and media. It does not need any generational cultural heritage. Cultural resources are treated as commodities in the world supermarket. What is sufficient is emotions, feelings, pleasure, and to be a fan (the last attitude is the main expression on Twitter and Facebook with the ability to "Like" things in that social realm). Cyberspace is a paradise for amateurs who can go global. Cultural capital presently changes its structure with the help of technology. Some rather simple—for youth, in particular—skills and competencies are needed for using audio and video systems, home movie, computers, tablets, various music players, iPads, and iPhones. So technological culture especially in its practical, operational form becomes a significant part of the cultural capital. Of course, growing technological culture is a positive asset; it makes out of us a technological man.

Cyberspace being a new social space is also a space for creation, dissemination, and consumption of culture. The consumption can transform itself into a

participation, not only amateurish. However, in this space mass culture, primitive and simplistic culture seems to be the most expansionistic and predominant. In the social portals are really the masses (in Facebook with more than 1 billion participants), so almost *ex definitione* it is not an aggregation of highly educated and sophisticated people being cultural elite. In not so advanced societies (e.g., in Poland), there are portals gathering "colleagues from elementary school" (*Our class*) or from prison (*Our cell*). All these show that the Internet culture in great part is a rather primitive pop culture that transforms itself into entertainment (so it can be called an entertainment culture); it is a culture of fan attitude (fan pages) and of permanently ongoing plebiscite ("I like it"). On the other side, it is market culture, culture of supply and demand, and culture of customer, client, and provider. Technology is able to provide such culture and to co-shape it. Internet groups or network tribes (they are not societies or communities in the traditional sociological understanding though they are often called so) are *pop-market human aggregates*. However, they have other significant characteristics, not rarely contradictory. There are, for example, transparency, openness, freedom (no censorship), transborderness, and even questioning property rights. Postulates are also formulated to treat the Internet as a *global public good* and an access to it as a *human right* (demands of Pirates Parties are even more extreme). Immanent for cyberspace activities is de-hierarchization and equal chances for all connected—everybody can be a broadcaster or film maker (for YouTube) or Wikipedia editor or network artist. There are no limitations for self-expression and self-promotion (in bloggers' cases) and for communication and interactions. Moreover, the cyberspace makes it possible not only to communicate personally and interact but also to manifest political opinions, to protest on a large, even international scale, to exert pressure on politicians, business, media, to participate in public debates, and last but not least to perform participatory democracy having a technical possibility of permanent referenda online.

ICTs' Impacts

The aforementioned technology-driven possibilities that are still anew will shape the culture broadly understood, not really symbolic culture or art per se, but culture of communication, behavior, political culture, culture of co-operation, and the like. It is difficult to predict how these various dimensions of culture will look in the future. Will this new neo-culture dominate the old culture based on other, pre-electronic technologies? Will there be people excluded from it? Nowadays, even the uneducated and poor can—at least to some extent—consume the old culture. In this new phase called *informationalization* (to recall Castells term)—besides netocratic *Weltanschauung* and netocratic ethic—will some new cultural hierarchies, some opposition groups, some virtual opponents, and revolutionaries emerge? And, if so, will they influence the nature and characteristics of the future culture? It is difficult to predict how strong the pressure will be of

new technologies creating new possibilities, *ergo* new applications. New technology may be ahead of culture ascribed to the older technological generations. Development of technology practically has no limits (except for funding and sometimes cognitive barriers, which is normal); it is semiautonomous (however, it is not fully beyond the existing culture) and notoriously is ahead of culture (according to W. Ogburn's principle of the technology—society relations). It is so because culture is as a rule less dynamic, more conditioned by the past and by previous values, and also institutions. It is not only creative but also adaptive. So it is possibly a continuation of the present revolutionary type of technological change. Thus, it seems probable that technology can dominate entirely over culture, which will be at the same time a premise for its further technologization and transition toward trans- and post-humanism.

Emotions, feelings, visuality, compulsive communication, being always *online*—all these are provided or facilitated, even excessively, by ICTs. This excess of possibilities, information, contacts, reactions, expectations, and options seems to be a problem. Additionally, the future will be connected with a new culture of creativity of one's own individual virtual worlds (thanks to the VR technology that will be more and more developed, cheap and accessible). This culture may be the culture of virtual escape from reality. Will the new world will resemble *Second Life* with avatars and perhaps advanced robots? Under such conditions, the traditional meaning and discourse on culture may be totally inadequate. This challenge will be faced—if at all—by the future generations of information society (i.e., by fully digital natives, *born digital)*. Will they be totally limited by technological imagination or will they try to transgress it? Culture seems to be less and less a kind of "steering mission" and "producer of history" (by the way, it is doubtful if ever it played such a role effectively). Culture stops to be a way of maintaining some sort of equilibrium and common world building. Under the conditions symbolized by such terms as *civilization of diversity*, *globalization(s)*, *network individualization,* and *privatization of the future,* culture becomes more in concert with technological rationality, technological opportunities, and tempting offers—promoted via media and consumed via market. Such a situation yields a *liquidity*. According to Bauman, this liquidity of reality is imminent and implied by self-intensifying, compulsive, and obsessive modernization (Bauman 2000). And such modernization is technology based and is not reflexive. The more new technology, the bigger demands for it and bigger its influence, also on culture. Thus, the pressure of technology will not be weaker in the future as well.

Changing Roles and Meanings

The academic-humanistic perception of the role and meaning of culture has often been a burden of wishful thinking and often underestimates or overlooks influence and impacts of technology. Predominance of technology seems to be indispensable in the face of environmental and demographic challenges and is fortified by

the cognitive mission of technology, which is connected with research and experiments, not to mention its crucial utilitarian function for the military, industry, media, and households. So technology has its powerful agents everywhere. In the space of technology development, there are various actors, stakeholders, and users, who are also detrimentally impacted and excluded. Distribution of "technological fruits" as well as their costs and risks is not equal in societies and through generations. In the practice of development, the technological and economic rationalities are approaching each other. The so-called technoscience is significantly practically profiled. Innovations are commercialized and marketed. A part of costs of their development and risk is often covered by government funds and agencies (e.g., the Advanced Technology Program in the USA). So it is difficult to win a battle against technology or to get an advantage over it. Simply technology pays—in spite of costs, risks, and catastrophes. A return to a stage of primitive ("barbaric") technology seems rather improbable.

The situation of culture is fundamentally different. Culture is a "high value," not a practical need necessary to survive. For this reason, its primitivization seems quite possible (and such a process is de facto ongoing). This process is multicausal. In the past, the high culture was represented by higher classes—aristocracy, noble class, and intelligentsia. They inherited traditions, cultural needs, and "cultural stuff" (books, paintings, pianos, etc.) and passed them to next generations. Mass dissemination of culture, its "democratization" means downward direction to rather primitive tastes and amateurship (circus culture, street culture, tawdry culture, break dance, low-level literature). Revolution of the masses, which were often of countryside origin and uneducated, has broken or radically transformed and downsized the process of historical cultural accumulation and of respecting and inheriting high culture and cultural competences as well. This can be countered by the argument concerned with the emancipatory mission of technology. Technology is a key of development at large. However, nowadays culture, especially high in spite of fantastic technological possibilities (as hi-fi recording, global broadcasting, etc.), is not a *sine qua non condition* of anything—business profit, professional career, or social relations. In the present civilization called "civilization of impatience and haste," the dominating (in media) and overwhelming (the youth) pop culture is basically a *culture of events*. Privatized human life, prevalent strive for consumption and entertainment, and economic instability (mass unemployment or its danger in many countries) all of these are reasons and conditions in which it is a daily life that predominantly shapes culture, not as previously when culture had a superior position. Availability of technological devices and access to the Internet auditorium lead not to mass creativity and artistic values, but to spreading rather simplistic amateurship and rubbish-type culture. In a such culture, the most important thing is a number of fans, not professional evaluations and criticism. Cultural style of life is determined to a significant extent by the Internet gurus (e.g., Zuckerberg, Wales, Assange) and popular celebrities. Of course, mass popularization of culture, its possible interactivity, its immediate messages, and opportunity for creativity are undoubtedly positive phenomena.

However, it is not sure whether they will outweigh mediocrity in the future culture.

There is a growing evidence that culture terminates step by step its role as a driver of development of societies that were shaping them fully in the past. Now culture becomes rather a *context* that has much less formative influence and that is subordinated to various feedbacks, for example in relation with technology. In market societies, culture defends itself by raising its quality and allowing commercialization at the same time—however, with support from enlightened governments and citizens (gifts, foundations, grants, and state budget financing). In culturally advanced societies that at the same time have a numerous population, the high culture has a good chance in their big markets. But is this true for the whole world and for the whole of mankind? There are some hopes in globalization, and also in the possibility of transfer and imitation of cultural leaders' patterns. So hopes are located de facto in technology, which enables this but not automatically, not equally, and not immediately.

Clash of generations—traditional vs. digital—is also manifested in culture, cultural activities, and cultural values. The digital world promotes a different approach to culture—culture should be free, accessible for all, as well as knowledge and information; the Internet should be a public good, and access to it should be treated as a human right. These are rather revolutionary postulates. But still we live in the hybrid world (real and virtual). That is why it is difficult to predict the future of culture (its all forms—symbolic, material, technological, spiritual, etc.) and its interactions with technology.

Modeling the Future Development

Both culture and technology are domains of human behavior and activities, and of creativity and risks, they are sources of profits and possible negative side effects. These domains, at least until now, connect or even integrate with man, with the *homo sapiens* species; they are—interactively acting—driving forces of its evolution. Mankind develops thanks to technology (this means a co-evolution) and is in a dialectical relation with the surrounding environment. This environment is partly—still—natural (and excessively exploited and devastated by technology, production, and other human activities) and partly man-made, artificial, and built mainly with a help of technology. This *eco-artificial environment* influences and limits man and his activities, but also generates the new developmental occasions. In the evolution of man and his world of spirit and of practice, culture plays a significant role in all aspects and dimensions, and at all levels. Culture impacts and shapes people (in the generational sequence in particular) and also co-shapes technology and its practical applications, and the environment. But it is also transformed itself—for example, it is increasingly technologized, electronized, virtualized, disseminated, and used. A systems approach and socio-cybernetics can be instrumental in the analysis of such systems as technology, culture, environment,

and society. These systems can be complementarily investigated as networks (Web theory is useful). Both aforementioned approaches together unmask their complexity and multiplicity of relations, which are quite difficult to recognize and to analyze and to present in schematic figures. To make a figure readable, a far-reaching schematization is necessary. Figure 3.1 (see Annex) is an attempt of presenting an ideal model of influences and interactions in the evolutionary processes of the human world of life (in regard to technology in particular).

The model can be presented at least in three versions:

- as a model of diffusion (one way and of different intensity—in time and space),
- as a model of interactive impacts (multidirectional, both spontaneous and steered with differentiated strength and effectiveness),
- as a model of one-directional domination (i.e., asymmetry) in which technology, culture, and environment are dominators (single or in coalition)—that had its place in history (e.g., in the form of total dependence on nature a long time ago or nowadays while we depend on technopoly and what can happen as well in the future).

While estimating the great role of culture in driving and humanizing the technoeconomy development, it seems rational to demand—as in the case of the idea of sustainable development—also a *sustainability of culture*. It can be pursued—in a similar way—in the form of concepts, strategies, and policies derived from normative and empirical premises and convictions, maintaining that perseverance of culture and its sustainability is a *sine qua non* condition of perseverance of humanity.

Cultural sustainability is important in itself, but it is also necessary for a whole sustainability of society. It may play a special guiding role in societal choices—for example, in consumption, environment protection, relation between men–animals, alternative energy, eco-innovations and eco-design, and ecological security. Social culture and cultural values are essential for reaching and maintaining a trajectory of sustainable development. In the case of failure to accomplish this purpose, the culture may degenerate and become a culture of fear and opposition (to technology and growth). Cultural change is always lagged, always behind technological change (Ogburn's principle). Sustainability requires more prospective orientation of cultural change and focusing on risky aspects of technological advances. For this purpose, cultural sustainability should rely on humanistic values since the future of humanity is at stake.

In the long perspective (50–100 years and more), transformations of man and his world are able to create evolutionarily a new reality, more technological in substance than biological. A world of self-replicating robots and cyborgs and self-organizing systems of machines, the world strongly virtualized will certainly produce new (evolutionary?) mechanisms and new (technological?) principles of game for the coming Transhuman Era and then for the Post-human Era. This can revert the present proportions of the biological and the technological and lead to "the world without us." *Nota bene* the cosmologists predict in a very long future the end of the human species. The aforementioned trends and events may radically

accelerate this end. The beginnings of transhuman culture are already visible. However, it seems extremely hard to imagine a culture of a post-human man or a culture of machines. Perhaps technology, per se, and its abilities of simulation and creation could greatly help.

Annex: Approaches and Conceptualizations

To better understand a complexity of all interrelationships, conditions, and recip-rocal influences of technology and culture—in the context of development of soci-eties and human individuals and of various processes reconfiguring them—several schemes together with interpretative description are presented below.

Figure 3.1 illustrates graphically components (sectors, spheres) of the human world of life. It shows its complexity and multidimensionality and existing types of impacts (connected with market, politics, strategies, and behavior).

Figure 3.2 illustrates mechanisms and processes of development. Systems, strategies, policies, and behavior shape and modify development. Processes of development should be investigated in the context of relations of knowledge, mar-ket, and culture what allows for etiquetting societies according to their character-istics and dominated features (Fig. 3.3). Societies of the world are very diverse as to these characteristics and to their levels and intensity. Generalizations are hard, though some trends seem to be quite clear.

In the past decades, there were many efforts to give new names to chang-ing societies. Social change was predominantly shaped or driven by technology,
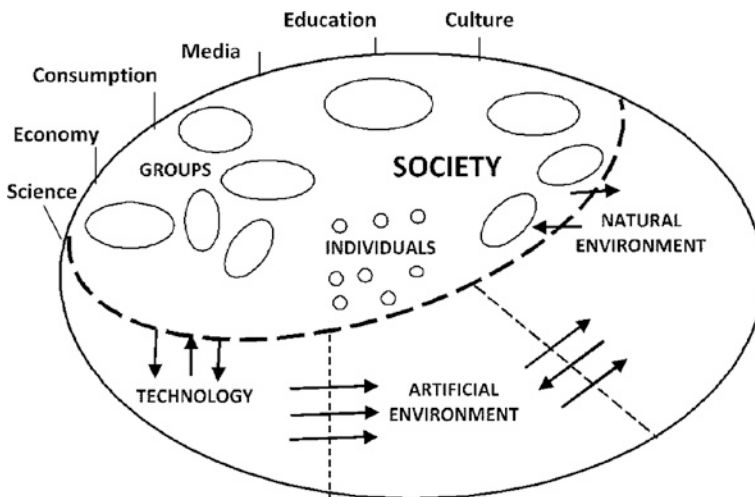
Fig. 3.1 Ideal model of influences and interactions in the evolutionary processes of the human world of life
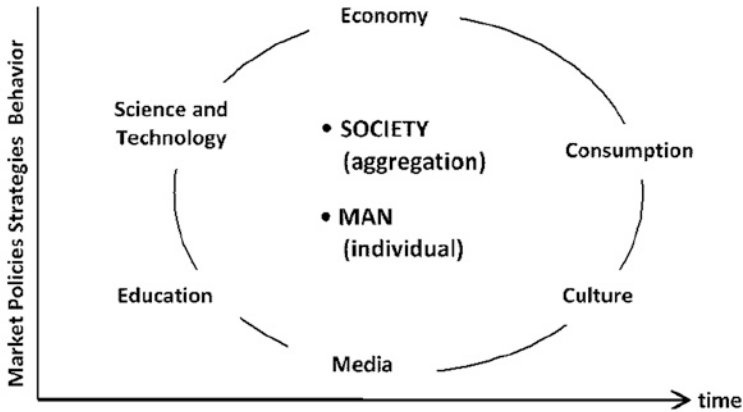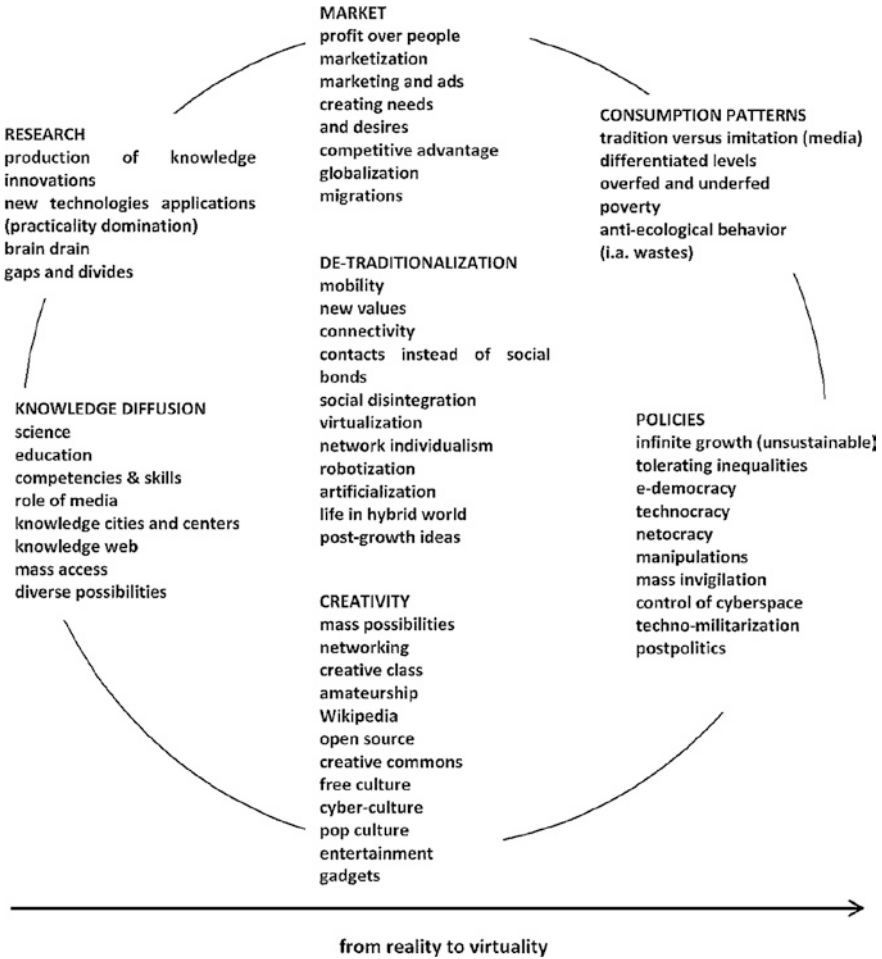
Fig. 3.2 Components (sectors, spheres) of the human world of life

market, and culture. These domains determine a fabric of social change in general (Fig. 3.4).

In the real cases, the etiquettes could overlap. Usually a society could be characterized by a set (a mix) of etiquettes. Social change was a change in such a set regarding its elements, their meanings, proportions, relations, and importance. Unsuccessful change was often connected with existing gaps of various sorts (see Fig. 3.5). Recognizing gaps enables a better understanding of development and its barriers (diverse through societies and regions).

These gaps can be assigned to countries, societies, and organizations. There are, of course, many more gaps and divides as information, organizational, management, digital. They are often interconnected and mutually stimulating each other. Many gaps are inherited and difficult to overcome. Identification and recognition of gaps and their various constellations are important not only theoretically but also for strategies and policies elaboration and their implementation. Evidently, all details of gap classification are subject of interpretation.

The next scheme (Fig. 3.6) is, in fact, the listing of processes characterizing the present changes in societies (as a rule making possible by technology and stimulated by technology) and challenges (not to confuse them with goals), challenges connected both with a global survival and development and with issues associated with market, politics, and multiculturalism. The scheme below presents a complex picture of sometimes really negative trends in societies (differentiated throughout space and time). It is designed also to define and explain various uncertainties, risks, and dangers. They should be examined in depth and should constitute a basis for new proper policies and strategies, and for research and societal education as well.

MARKET
profit over people
marketization
marketing and ads
creating needs
and desires
competitive advantage
globalization
migrations

RESEARCH
production of knowledge
innovations
new technologies applications
(practicality domination)
brain drain
gaps and divides

CONSUMPTION PATTERNS
tradition versus imitation (media)
differentiated levels
overfed and underfed
poverty
anti-ecological behavior
(i.a. wastes)

DE-TRADITIONALIZATION
mobility
new values
connectivity
contacts instead of social
bonds
social disintegration
virtualization
network individualism
robotization
artificialization
life in hybrid world
post-growth ideas

KNOWLEDGE DIFFUSION
science
education
competencies & skills
role of media
knowledge cities and centers
knowledge web
mass access
diverse possibilities

POLICIES
infinite growth (unsustainable)
tolerating inequalities
e-democracy
technocracy
netocracy
manipulations
mass invigilation
control of cyberspace
techno-militarization
postpolitics

CREATIVITY
mass possibilities
networking
creative class
amateurship
Wikipedia
open source
creative commons
free culture
cyber-culture
pop culture
entertainment
gadgets

from reality to virtuality

Fig. 3.3 Mechanisms and development processes. Selected systems, strategies, policies, and behavior in the context of development, knowledge, and culture

Global processes and challenges are located in structures and networks (or their "mixes"), so are their mechanisms and developmental processes and phenomena, as well as their effects and consequences.

Figure 3.7 (below) illustrates the failure of the concepts (and predictions)—often associated with theory of modernization based on expectation of common imitation of development patterns (technological, economic, political, cultural, and so forth). Such imitation had to concern a consumption. A wide distance between leading countries of the world and the rest does not allow for really common and effective imitation and—what's more important—achievement of similar results. It is so in spite of the ongoing processes of integration, globalization, technology transfer, migrations and international networking, and co-operation. Despite
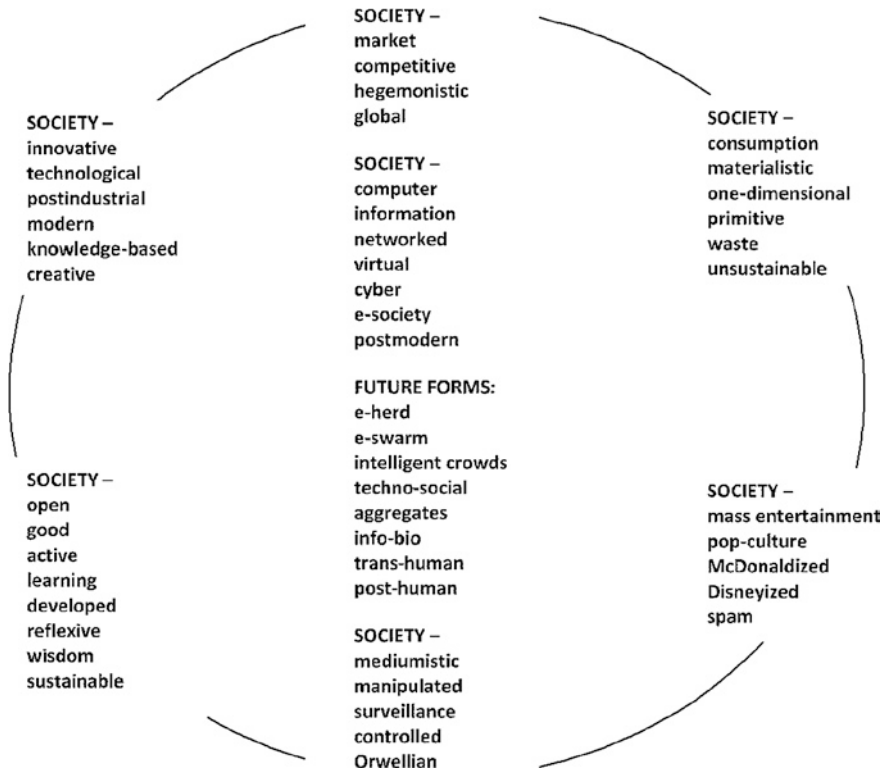
Fig. 3.4 Etiquettes for societies (knowledge–market–culture)

similarities, the predominant feature seems to be a diversity—not of declared goals and policies but of real actions and their effects. The reason of it is on one side a large differentiation of national developmental potentials and on the other side not equal cultural ability to creation and application of technology in various domains of human life. This should be emphasized in policies for development and international aid and cooperation.

In the subsequent stages of human civilization and its development, significantly co-shaped, and stimulated by technology (discoveries, inventions, innovations, their applications, and diffusion), various "profiles" of cultural challenges associated with these stages emerged. Figure 3.7 is a proposal of ordering the existing types of these challenges in relation to the stages of development (from prehistory to Post-human Era).

This classification of the types of culture prevailing in the subsequent stages of development of human civilization is arbitrary. Needless to say that these stages and the corresponding cultures sometimes overlapped or had "fuzzy" borders. In some cases, the transition from one to other was evolutionary, and in other cases revolutionary; sometimes changes were inductive, and sometimes they were indigenous (Fig. 3.8).
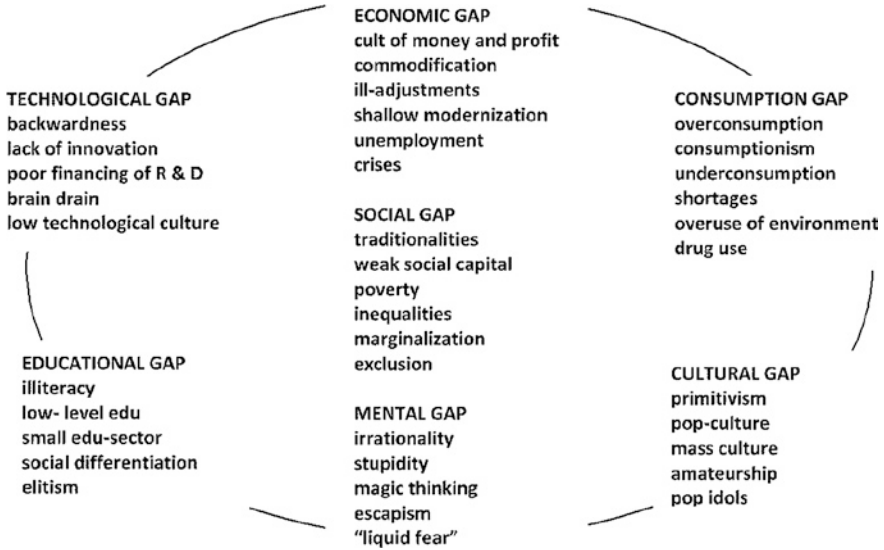
ECONOMIC GAP
cult of money and profit
commodification
ill-adjustments
shallow modernization
unemployment
crises

TECHNOLOGICAL GAP
backwardness
lack of innovation
poor financing of R & D
brain drain
low technological culture

CONSUMPTION GAP
overconsumption
consumptionism
underconsumption
shortages
overuse of environment
drug use

SOCIAL GAP
traditionalities
weak social capital
poverty
inequalities
marginalization
exclusion

EDUCATIONAL GAP
illiteracy
low- level edu
small edu-sector
social differentiation
elitism

CULTURAL GAP
primitivism
pop-culture
mass culture
amateurship
pop idols

MENTAL GAP
irrationality
stupidity
magic thinking
escapism
"liquid fear"

Fig. 3.5 Components and characteristics of development gaps

General processes:	Areas and impacts
technologization	artificialization
globalization	reconfigurations
McDonaldization	uniformization
Disneyization	entertainment
mass reach	"democratization",
	pop-culture
	cult of amateur
infantilization	pop-fashion entertainment
barbarization	primitivism and vulgarity
exhibitionism...	permissiveness
	Internet behaviors (stalking, bullying, etc.)
idiotization	advertisement
	media sensationalization, tabloids, esoterics

General global challenges (not goals)

limits to growth
uncertainties
risk and dangers
survival
development and
progress

demography (overpopulation of Earth)
resources (exhaustion, increasing costs)
environmental devastation (worsening quality)
crises (ecological, political, social)
conflicts and wars (over resources and hegemony)
catastrophes (natural, technological)
poverty and its impacts (health, social, political)

- competitiveness – dependence – hegemony
- marginalization – exclusion
- diversity and hybridization of the world:
    poor – rich
    low tech – high tech
    less sustainable – more sustainable
- global mobility (migrations)
- ageing of industrial (advanced) and democratic societies
- change of the national and world proportions and strength of races, religions, cultures, etc.
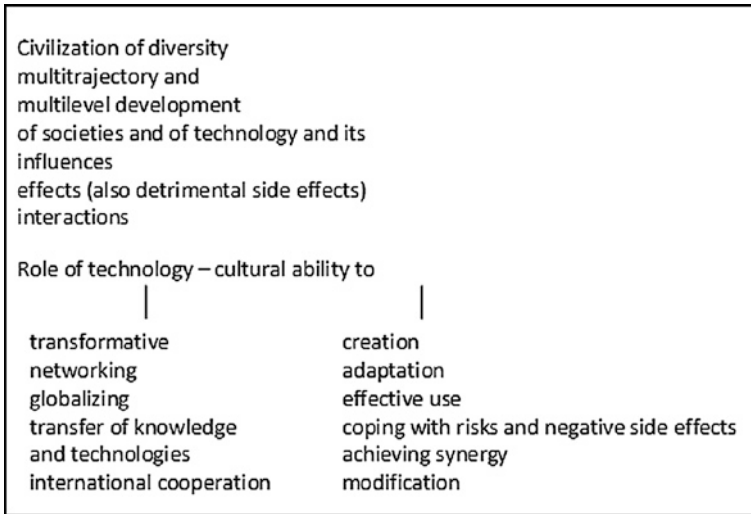
Fig. 3.6 General processes and global challenges

Civilization of diversity
multitrajectory and
multilevel development
of societies and of technology and its
influences
effects (also detrimental side effects)
interactions

Role of technology – cultural ability to

|

transformative
networking
globalizing
transfer of knowledge
and technologies
international cooperation

creation
adaptation
effective use
coping with risks and negative side effects
achieving synergy
modification

Fig. 3.7 Failure of universalism and its ideology

- "struggle over fire" (prehistoric stage) – culture of survival
- "construction" (infrastructure, industry, struggling with nature) – industrial culture
- building artificial environment (on large scale) – culture of denaturalization continued
- scientific and technological revolution (research paradigms, nuclear energy; space exploration, ICT, biotechnology, nanotechnology) – scientific and technological culture, culture of technologization and artificialization, cyber-culture emergence
- uncertainties, risks, dangers and undesirable detrimental side effects of technology and development – culture of risk evaluation, and culture of consequentionalism
- new struggle for survival (crises, demography, finances, economy, environment, politics, conflicts and wars, mafia, terror) – culture of global survival
- emerging new concept, strategies and trajectory of sustainability – culture of sustainability
- future-oriented civilization – culture of transition and change (trans- and posthumanism in perspective)
- "world without us" – posthuman culture, machinekind culture (?)

Fig. 3.8 Stages of civilization development and technology—types of culture

Essential features of all de facto processes of development are uncertainties and feedbacks (both positive and negative). So analysis of the change in human setting (or generally speaking—of civilizational context) in connection with change in man (as individual) and in society (or various forms of human collectivities) is crucial for an understanding of the past and also of the present world. Individual and societal transformations are both "products" and "generators" of broadly understood culture. However, such analysis does not mean the recognition of the future, which is an effect ("resultant," "sum") of all types of changes. The future, the long term in particular, seems mostly unknown and open ended. All the more, we should think about it in a scientific way (using forecasts, simulations, scenarios, strategy elaboration, long-term policies, planning, computer modeling, etc.), drawing our attention to the instrumental and determining role of technology and its relations with culture.

Figure 3.9 is a graphic presentation of such issues as feedbacks and uncertainties in development.

Analysis of feedbacks is typical for a systems approach. Uncertainties are investigated with risk analysis methods. Technological and social changes can be also analyzed with the aid of Web theory. However, for this reason the types of networks should be distinguished. The exemplary classification can be as follows.

Technocultural changes always have—and will have in the future—their proponents and opponents, both in theory and in practice. However, it goes without saying that the most important are agents of change or in other words carriers of change. Various subjects designed to conduct change or to slow it down can be engaged. This is illustrated in Fig. 3.10.

In conclusion, it is worthwhile to return to the idea of social assessment of technology (TA in short), from which its advanced concepts, methodologies, and procedures enable also a recognition of various relations, influences, interactions, and impacts—both advantageous and disadvantageous for people and environment (Fig. 3.11). They make it possible to formulate essential research questions addressing at the same time political and cultural issues and controversies. Some exemplary research questions politically and culturally bounded are presented in the table below Fig. (3.12).
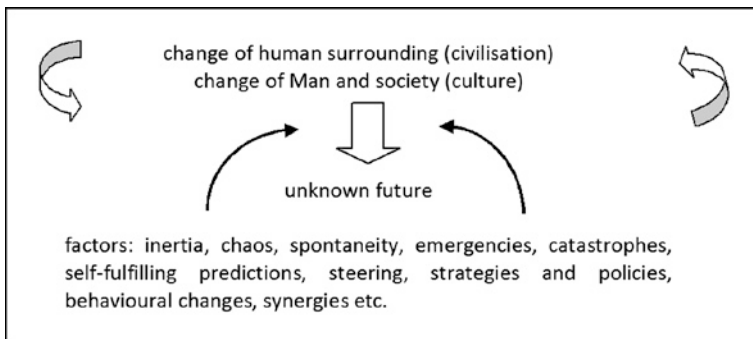
Fig. 3.9 Feedbacks and uncertainties in development process

Fig. 3.10 Exemplary enumeration of traditional and teleinformatic networks

Subjects in question:
various structures, networks, organizations, institutions, groups, individuals
- who wants to maintain *status quo* (as good)
  because of inertia and tradition
                vested interests
                business as usual attitude
- who resists changes (as risky and detrimental) in the name of ideology,
  values (e.g., greens, anarchists, anti-globalists, anti-system movements
  etc.) and to promote their political position
- who proposes and creates alternatives (to ameliorate) (e.g., innovators,
  visionaries, intellectuals, alter-globalists, prospective thinkers, proponents
  of sustainable development)

Such subjects are present virtually in all structures of societies, also on international and
global scale. However, their proportions, strength, and reach determine "shape" of change,
its direction, and transformative power.

Fig. 3.11 Agents and opponents to technocultural changes (basic classification)

Questions and issues:

- what technology
  - has done so far
  - is doing now
  - can do in the future
  - cannot do
- how to study technology
  - assess its impacts
  - modify its features and impacts
- who is a subject of
  - choice

  - decisions

  - evaluation

when and where
for whom
at what costs
whose costs

time horizon (short, long term)
positive and negative
innovations and redistribution
political mode:
    economocracy (business, market)
    technocracy (technicians, techno-structure)
    democracy (democratic procedures, negotiations,
      deliberation, consensus seeking, participation,
      public good)
    netocracy (networking of business and political
      decision-makers with mass-media)
    autocracy (political autocratism, plutocracy)

Fig. 3.12 Technology evaluation—selected research questions

In parallel in a similar way, some questions addressed to various forms and dimensions of culture of the future can be formulated. Such exemplary questions can be as follows:

- What is culture nowadays?
- What are its types and dimensions?
- What are the directions of its transformations and change?
- How are they caused or supported by technology?
- What are new domains of culture and what happens in them (e.g., in cyberspace)?
- What is the present influence of culture on the "shape" of world and the lives of people?
- What are the short- and long-term consequences of cultural transformation in the world?
- What will the culture of the future be like, also from the perspective of trans- and post-humanism?

To have a more complete view and understanding of the ambiguous relations and interactions of technology and culture, it is worthwhile to confront both lists of questions. And even more important seems to be confronting the answers to these questions.

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