
Contexts of ICT Development and Use: A Reflexive Interdisciplinary Approach

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Abstract

The contexts of ICT development and use can be classified according to distinctive domains. All mentioned contexts have their own specific embedded rationality that can be both demand creating for ICTs and stimulating for their advance and supply. Of course, these contexts may act adversely. Accordingly, generalizations are rather questionable. In concrete cases, these contexts should be examined in depth, measured, and evaluated. This study proposes the use of aggregate submodels, which then can be assigned to investigated societies or their groups. This approach could be instrumental for policy-design and implementation on all levels of decision-making on ICT development and use.

Between universalization and diversity

Some universalization of technology, its development, use and impacts are hard facts rather than delusion. It is stimulated significantly by such processes as globalization, international trade, technology transfer, accepting imitative patterns by less developed countries and societies, by cooperation and growing networking, as well as through the adaption of various neo-colonialistic practices of giant transnational corporations and hegemonic states. The role of the media in these processes is huge. Such universalization tendencies are theoretically based on the idea of progress and the theory of modernization. Also, various versions – both strong and weak – of technological determinism with its imperatives and triumphant optimism stimulate technology-oriented thinking on the future. Still, visions of the future(s) are mostly technologically-based; for example visions of artificial intelligence development and robotization, the Singularity era (Kurzweil 2004), space conquest, the Posthuman Era (Babcock 2001; Featherstone 2000) and the like. Scientific and technological world elites create

such visions and participate in their realization, thus helping governments' and businesses' strategies. This situation produces a specific intellectual atmosphere that is diffused worldwide by global media. This atmosphere is thus a kind of *mental context* of the present information revolution.

But there is another context, which is connected with history, cultural values and the ability to stimulate development (of technology and the economy). In this context, there are *centers and peripheries*, with the latter prevailing in the world. The situation they find themselves in is historically bounded, and their take-off in the development process was late and often difficult (for many reasons, such as colonization and dependence). As a result, their civilizational (material, technological, industrial, infrastructural) development came to be insufficient, incomplete, irregular and not compatible or competitive with leading countries. Moreover, cultural values and abilities usually were unfavorable to progress (understood in terms of the Western enlightenment ideology and industrial and scientific practices). This state of the world manifests its *hybridity*, which constitutes an extremely important present context for thinking and acting, also with reference to ICT development, use, transfer, effects and impacts in both, centers and peripheries.

It is an ongoing civilizational and economic *reconfiguration* of the world, and new powers (such as China, India, Brazil) are emerging. They join the stream of technology (originally Western), but their cultural values and abilities to change toward an *information society model* remain different. This exemplifies that not only historical conditions, heritage, etc., but also present policies, values, attitudes and behavior of people create another dimension of *diversity*, which contributes to the world's (historical) hybridity.

This is one additional factor to the present world hybridity. It is connected with increasing *criticism* of an information society (also called virtual, digital, based on knowledge, etc.) of its emerging forms and imagined futures (which are created by market and corporate strategies and decisions, by government policies often connected with military-oriented research and production, and by marketing and ads).

The critique of the present course of development – economic, technological, social, political and global – can exert a certain influence on

real processes. This critique is not only within the triumphalist *ideology of information revolution*, but also is manifested in, at least theoretical, contestations in economics (e.g., the concept of post growth, common good economy and sustainable development). Critics can also be found among technological innovators (such as J. Lanier) and among researchers investigating effects and impacts of ICT and its use (such as Small and Vorgan, Keen, Fuchs and Turkle). Evolutionists interpret increasing *consequentialism* as a sign for the maturity of humankind (with not only actions being important, but their effects being particularly detrimental). Criticisms and concepts such as technology assessment and impact assessment, especially when performed in practice, can make a difference in our *mindset* and *Weltanschauung*.

The digital generation is impacted both by technological change and by non-technological – ideological and cultural – inventions. There are some new (or re-invented) ideas, attitudes and actions that are *counter-cultural* to still dominating a techno-economic paradigm. In addition, some new concepts and practical efforts such as Wiki (Wikipedia, Wikinomics, Wikileaks), free culture, open access, open source, creative commons, open future and hackers' activities can be observed. There are also new ways of expressing political views, such as Wikileaks, the anti ACTA global manifestation, Pirate Parties, or the Twitter movement as experienced during the Arab Spring. These ideas, actions and understandings constitute a new context for ICT and its users. The cyberworld – in the network ideology – was designed and created as a separate space with different principles and rules, which often operate counter-culturally. Some movements of this kind may be mentioned, such as the slow movement, economy (and sociology) of gift, and minimalist ideas and practices. Minimalism (see works of its gurus inspired by Zen – L. Babauta, F. Jay, D. Loreau) is basically anti-consumptionistic; it is contesting the culture of consumption and possession of things. Quality of life and happiness can be measured differently. Interestingly, this emerging conflict of values has its *generational dimensions*. The digital generation – coupled with the present difficulties to get a job and bank credit – wants to be different than the yuppie generation and its materialistic values and attitudes. To be in a *digital world*, it is not necessary to possess. Accordingly, things

are not important; what really counts in life is access, participation, sharing, mobility, independence and individualism. “Generation minimum” prefers self-control and self-management of life rather than permanent shopping, travelling, entertainment and media (bombarded with ads and creating an “edited”, artificial world).

It is not possible to predict whether this generation – with its different values, attitudes and *de facto* different *rationality of life* – can exert any significant influence on principles and functioning of the market, culture or human relations. However, new movements and their practices contribute to hybridity or, rather, to the diversity of the world, making it full of contradictions. Accordingly, generational pressure based on ICT will probably become stronger with subsequent digital generations. This means that the context of ICT development and use worldwide will be more *complex* and perhaps modified more than we can imagine at present. Universality of technology will be strongly contested by diversity of values, attitudes, behavior as well as by differentiated “grounds” of technology advancement and usage. Counter-cultural type of contestation will be based on growing criticism of the digital world, on counter-reactions (such as minimalism, life’s implicitness, postmaterialism) and new undertakings (such as individual behavior and social movements propagating new values and new rationality). It is needless to prove that ICT development is conducted mostly according to a traditional ideology (of development, consumption and technology) and old-type economic (market) practices and mechanisms. Will new phenomena become trends or megatrends prevailing in the future? In such a case, possible trajectories of ICT development and use may be modified or fundamentally changed.

Accordingly, hybridity or *multi-diversity* of the world is likely to continuously exist in the future. It will be connected not only – as it does traditionally – with wealth, resources and stages of development, but will also be defined increasingly by values, ideologies and psychological attitudes. Technological systems could, more than at present, be not fully consistent. Thus it will be more complex for new technologies (produced by leading countries or companies) to be assimilated or to generate synergy and decent effectiveness. Also, *technical context* for technology development, ICT included, will be diverse in different regions, countries and

societies. In the most advanced countries, technologies will function as a system, in the rest rather as an assemblage.

The role of ICT and its applications may become more balanced, less optimistic than nowadays, and its evaluation may not only be demand and consumption-oriented. Besides positive and promising tendencies, cognitively valuable, such as an abundance of information, easier production of knowledge using ICT, better communication and cooperation, there are now growing doubts concerning *digital production* and the *processing of knowledge*. Interestingly, research indicates that our attention span is steadily decreasing. Quick computer information, instantaneous accessibility and constant communication (through Facebook and Twitter), as well as the ability to research online, keeps younger generations away from traditional libraries. Moreover, the move from print to electronic book collections are also criticized as being responsible for the degradation of our attention span (see McCormack 2013). Yet brain research proves that technologies used to find, process, and use information modify our brains' neural pathways. N. Carr claims that printed books better focus human attention and make thoughts deeper and creative while the Internet promotes rapid, distracted and multi-source sampling of small bits of information (Carr 2011). For some, digital technology seems to be "a new wave of stupid" (see IGI Global Journalnews 01/13). Are these fears real and how can this situation influence human cognition and the societal knowledge level and depth? Perhaps it will result in a great *elitism*, not in the real constitution of the so fashionably trumpeted knowledge society (of course, a knowledge economy in the form of, say, Wikinomics and macro-Wikinomics will be possible; see Tapscott 1998, Tapscott & Williams 2010). Such situations mean more *diversity* and, at the same time, more challenges for ICT development potentials, trajectories and applications. This is a case of – notorious in human history – *ambivalence* of technology's effects and impacts.

Another example, also showing ambivalent potentials and effects, is democracy. Of course, democracy is not only a technology-dependent issue. To introduce, accept, and develop e-government and e-democracy, a political will is necessary – combined with certain societal expectations and required skills. Cultural ability to wisely link technology and political

life are *conditio sine qua non* for success (e.g. Zacher 2007, 2009). It is needless to add that such abilities vary from country to country and from society to society. Fortunately, it can evolve over time.

ICTs mark a new era in management (company level) and in governance (state and local level). However, they can serve well for both, centralization and decentralization of power. They can be used for manipulation, control and surveillance (the term *surveillance society* was already coined by Lyon 2001), and, in contrast, for transparency, freedom and participation. Some may argue that ICTs tend to be used to spy on companies' employees and on citizens, or to censor information and support authoritarian practices and rules. Others praise ICTs as means of societal communication and public discourse, of whistle blowing and citizens' participation in decision making in many areas of politics and social life. However, some blame the Internet for possible anarchical actions (e.g. anti-globalist or Wikileaks types). Needless to add, in the *post political era* in which image and visibility (Sartori coined the term *homo videns*, explaining our dependence on screen messages and pictures in the pictorial civilization; Sartori 1999) are often decisive in elections, ICTs are instrumental. Moreover, some consequences of ICTs, though unintended but imposed by such contexts as terrorism, are harmful for freedom, privacy and human rights. National security measures may be in conflict with democratic values. Following this, the problem arises how (if at all possible) to develop, apply, and manage ICTs to minimize negative effects for democracy and human rights.

There are also *ambivalent impacts* of ICTs at the human level. To name some examples, ICTs make it possible for individuals not only to enjoy digital life (numerous connections, access to information, entertainment) but also to participate in distant learning and telework. The internet is a new *de facto* limitless space for individual entrepreneurship. It provides possibilities to act globally (in many areas such as education, art, international actions and cooperative activities), a development that can be called microglobalization. This enhances individual creativity. However, the downside of ICTs potentially is everything that exists on the internet in excess – for example, spam, info noise, pornography, low-level pop culture, mediocrity and stupidity, not to mention hating, stalking, bul-

lying and criminal activities. The problem lies not with these phenomena *per se* (as they are everlasting), but with their scale and impacts of this scale. The large-scale detrimental impacts may be, in perspective, very costly and unbearable. The emerging dilemma is whether to regulate this “informational trash” or not (also through technological solutions). Regulatory activities should include fixing various norms, standards, patterns, legal duties, joint policies, coordination, international agreements and treaties and the like. Regulations may establish some “framework conditions” or limitations for ICT development, applications and worldwide diffusion, their aim being not to hamper it, but on the contrary to boost it in more desirable – from a human and social point of view – directions.

Additionally, ICTs exert rather intensive pressure on skills, competencies and professionalism. This, for many people (such as the elderly, disabled, uneducated, those with obsolete skills or the poor), may pose an unfeasible or extremely difficult challenge. This situation brings about marginalization and exclusion of individuals and groups (not to mention organizations, industries and services). ICTs are increasing productivity and effectiveness in many areas at the same time, however, they contribute to unemployment, of a technological as well as a structural origin (by transforming the structure of the economy and production).

Contextual approach to ICT

Some issues and challenges

The issues raised earlier focused mainly on diversity, complexity and ambivalence connected with ICTs’ development (including their introduction and transfer), applications and diffusion, bearing in mind also their multifaceted effects and impacts.

For analytical (and pragmatic) reasons, even very complex problems are usually fragmented (research on fragments does not imply mono-disciplinarity). Researchers, business and political decision makers are therefore specialized to a great extent. In practice, the different fragments are not really autonomous, rather, they together – but not mechanically –

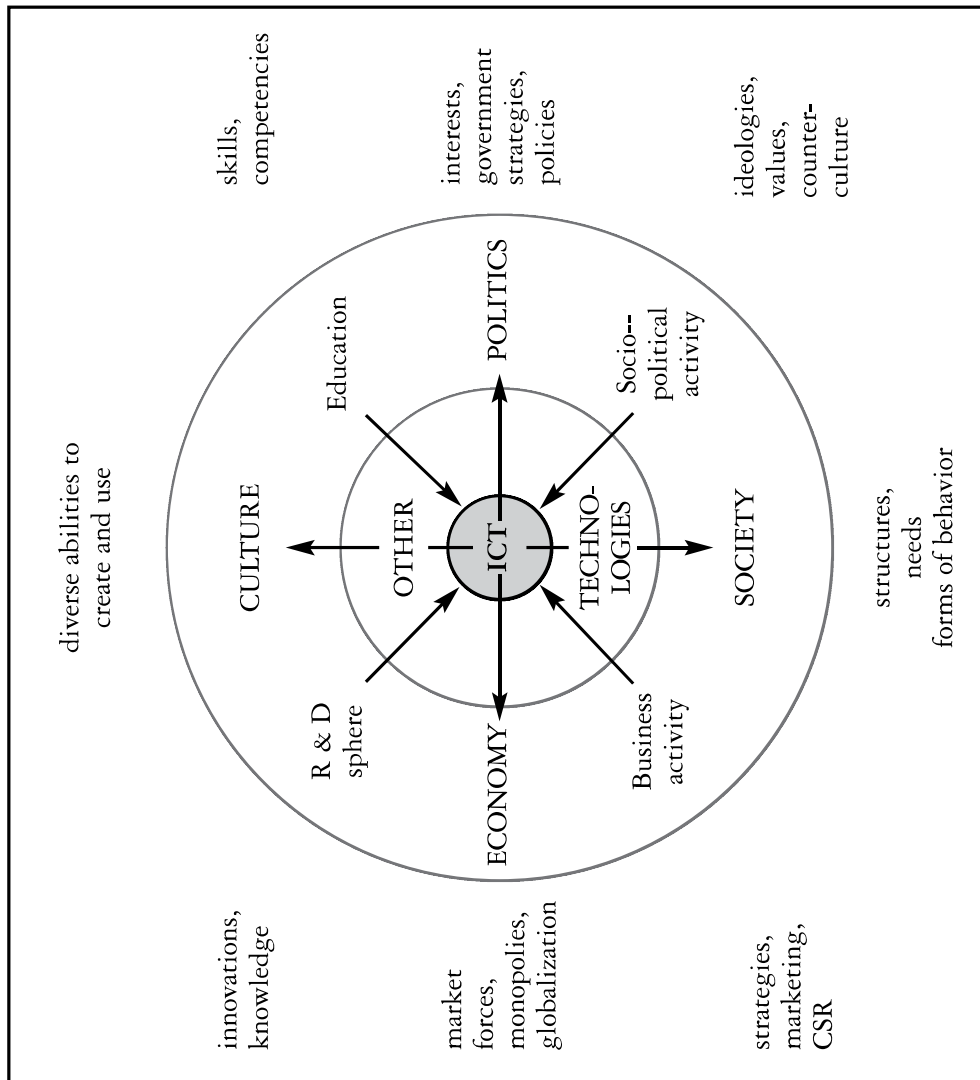
constitute a complex multidimensional space of human life. Especially in periods of great transformations, such as the ongoing information revolution, a comprehensive and holistic approach is needed. This may help to understand the complexity. No less important is an investigation of the connections, relations, interactions and feedback among these fragments. Considering an increase in time or growth (even if only in physical terms), various processes can be identified and separated. They proceed not in a *vacuum*, but in multiple contexts. Contexts can modify and co-shape processes, can stimulate them or slow them down, can be their catalysts or simply their only accompanying circumstances. Of course, the influence is usually mutual (however not necessarily simultaneous). New processes originate – no other way – in old or present contexts. Revolutionary processes, not only connected with technological revolutions, may change contexts radically and in a relatively short period; but sometimes they may be opposed, delayed or even stopped. The same concerns processes, activities and actions deliberately undertaken in the form of strategies, policies and behavior. This is why contexts should not be neglected; moreover, they can be used to realize deliberate goals and tasks. Also, the creation of new contexts is another way of evoking desirable changes. In other words, managing information systems, e-businesses, public policies and influencing human behavior require both types of activities. Thus not only context recognition, analysis and evaluation are fundamental, but also their feasibility to be changed. All intentional actions (technological, business, political) should take it into consideration to ensure implementation of the designed, planned and desirable ventures.

Context identification and recognition is indispensable for successful and effective ICT strategies and policies. Certain contexts may be essential, while others may act only as favorable circumstances. Also, resistant contexts cannot be precluded. The modelling of contexts should refer to a concrete structure (e.g. organization, particular society or economy) and to a defined period or time perspective in order to limit various diversities (e.g. geographic, educational, cultural, economic or political). Contexts can be strong or weak, dominating or neutral, firm or permanent, or changing in time (in the predicted horizon). The net of contexts may be extremely complex because of multiple feedbacks,

mutual influences, unclear connections and so on; yet their analytical decomposition may be helpful for research and for designing policy. Contextual diversity should be considered at all levels of analysis. Contexts are important since they can give meanings and values to technology at stake (be it ICT) and highlight limitations of its reasonable and profitable applications and diffusion. Contexts should be analyzed and assessed not solely from the point of view of creating opportunities and favorability, but also as possible barriers to be overcome and as vulnerable surroundings causing risks and challenging problems (e.g. excessive costs, unbearable challenges, fundamental structural inconsistencies and incompatibilities).

A simple contextual model of ICT influences and feedbacks is presented in Figure 1. It shows main contexts in which ICT is created, developed, applied, and diffused. Of course, these contexts, their influence and feedbacks are not the same (universal) in time and space (including cyberspace). Diversities among countries and societies are immense; contexts' size, role and strength are highly differentiated, and so are their proportions, relations and interactions. Differences become even more visible when some specifics are considered, such as geographic locations (and cyberspatial dimension), role of state (government), level of education and research (e.g. brain drain or brain gain), size of companies, role of technology transfer, FDI's, TNCs, but also social values and attitudes, business responsibility, level of technological culture, age structure of society, etc. Such an overall view is very complex and multidimensional. However, it can be prepared – at least partially and as a conceptual framework – by specialized governmental agencies, big corporations, major educational institutions, influential think tanks, international organizations and so forth. Naturally, their goals may differ – to stimulate research and innovation, to restructure the industry and service sector, to respond to military and national security needs, to promote export and technology transfer, to develop global networks and cooperation, to help the developing world and to present a vision of the (digital) futures. This diversity of goals, of possibilities and strategies make any generalization too simplistic and not operational.

Figure 1. Simple contextual model of ICT influences and feedbacks (selected arbitrarily).

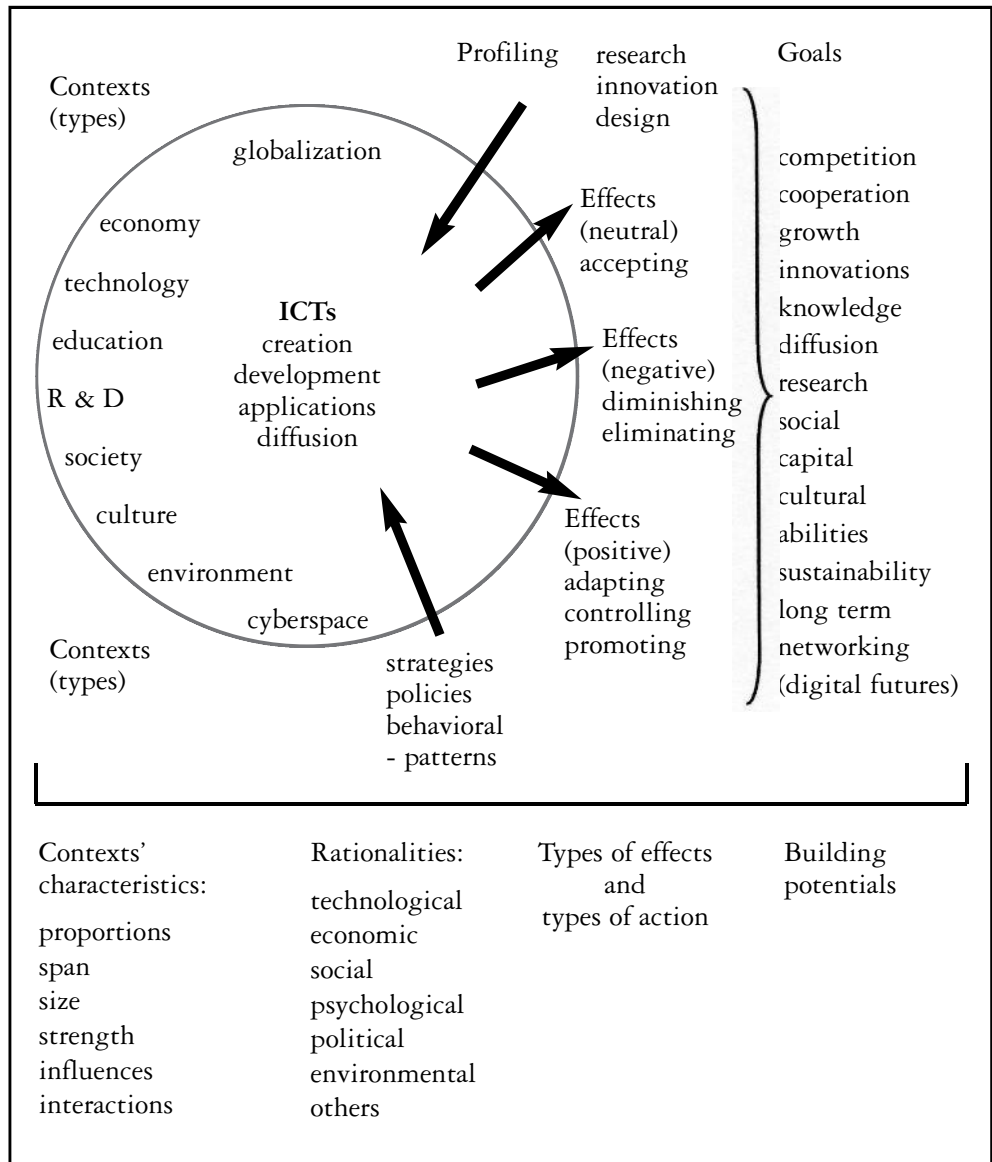


The shown multiplicity of various contexts is a difficult challenge, sometimes even an insurmountable obstacle for organizations, societies and individuals. To name all contexts in an abstract way is easier than to cope with them one by one or by their clusters or as a whole. Also, the list of contexts depends on criteria applied. For example, according to area of activity,

type of means of possible actions and territorial reach, one can distinguish numerous contexts: geographic, climatic, environmental, demographic, economic, social, cultural, religious, institutional, organizational, educational, technological, and also local, national, international, global and virtual (cyberspatial). The problem is that the contexts are, as a rule, mixed in one “matter”. In reality they may constitute various connected sets or clusters, not to mention their mutual influences and interactions. Nevertheless, one should identify and recognize what is really possible (e.g. considering some characteristics, certain specificities, some dimensions) and try to elaborate on a strategy (policy, behavior, attitudes, investigation pattern, etc.) in order to function effectively while introducing, developing, and applying new technology (e.g. ICT). A context study is needed to identify contexts’ type, their size, strength, potentials, impacts, their mutual proportions, their ecology and immanent mechanisms, their nature (whatever it means) and their functionality with respect to formulated goals and strategies. Choices and evaluations are tough since there is not just one rationality (except procedural) but sets of rationalities (ascribed to particular domains). The evaluation of a strategy's feasibility should consider factors such as limited means, market uncertainty, possible unexpected negative effects and the like. Choosing priorities and sequential order of actions may stay in conflict with strategies and activities of other actors (competitors).

The described problems are rather normal – *de facto* notorious – in case of large complexity, diversity and ambivalence, not to mention uncertainty, unexpected cumulations, interferences, chaotics, etc. Fortunately, ICTs can play their role here – computational and simulational [see conversations with A.-L. Barabasi on thinking in network terms to control and predict the behavior of a system and with S. Pentland on the Big Data concept and methods to effectively trace social interactions not being limited to averages (*Edge*, Sept. 28, 2012: <http://edge.org/event/special/-computational-social-science>)]. New methodological and computational methodologies and instruments will be able to analyze contexts, their proportions, size, span, strength, feedbacks and influences and to choose priorities and sequences as well as to identify contexts – structural, transitory, changeable, inter-ferential and overlapping. Still, complexity will remain a problem (see Figure 2).

Figure 2. ICTs in main contexts – profiling and adapting



From the point of view of the elaboration and implementation of strategies, policies and patterns of human behavior, it is possible to suggest the use of the game theory together with the web theory. Both can help to investigate various networks of contexts, relations, interactions, strategies, policies,

actions, actors (decision makers), and stakeholders, interests, expectations, rationalities, cultures, etc. Various possible games (both in real and virtual worlds) add to the already large complexity of context investigations and modelling, not to mention the variety of options and actions to win. Games vary from political and ideological to concrete, from market and business to public sphere, from local and national to international and global, from short to long term, from organizations to individuals and from competitive to cooperative.

Conclusion

Assuming that amelioration of the present non-optimal situation and risky trends is possible and feasible (in spite of countries' diversity of potentials and strategies), some desirable changes can be postulated. They go beyond the *business as usual* approach, which is based on – simply speaking – maximizing the supply of ICTs and their products and services, shaping needs by marketing and ads, as well as on the imitation of people's consumption patterns (treated as customers, clients and consumers – not citizens). Fig. 3 (see annex, page 228) illustrates a possible ameliorative transition framework.

Desirable change should be based on multiple rationalities (negotiated and agreed) and should contribute to human-centered social and individual development, quality of life and concern of future generations. Thus, the nature of society may differ from a market e-society while having exposed such features as sustainable, civil, just, knowledge-based and wise characteristics. Such radical change may never be fully completed, but striving for a desirable trajectory (direction and edge conditions) is important and hopeful.

Present decisional and behavioral contexts are constituted by relations, connections, flows of information (also of capital, technology and people), mutual influences, interactions, networking, controversies and conflicts (of goals, interests, ideologies) of all actors, shareholders, stakeholders, i.e., all involved (directly or indirectly) in the process of ICTs (research, innovations, applications, diffusion and evaluations). Moreover, there are some "external" frameworks and mechanisms (the market, semi-autonomous technological progress, the existing political system, social values and global

competition). This makes for a very complex and complicated matter for rationalizing decisions, activities and human behavior. Rationalization is not a utopian assumption but a *de facto* practical necessity for countries, societies, organizations and individuals. Already a few decades ago, the term maldevelopment was coined (Danecki 1993). This expression can also be used to, in critical terms, describe the present. There are many signs (and indicators) for maldevelopment in the 21st century, examples being political authoritarianism, militarization, inequalities, poverty, environmental problems, unemployment, digital divide and social exclusion. Maldevelopment in this sense is a kind of context that hampers progress (as measured by multicriterial indicators, such as the Human Development Index or Happiness Indicator).

The contextualization of ICT design, production, dissemination and usage seems to be an important and promising approach since there is a large variety of factors – contextual, specific, particular and circumstantial all over the world. In order to enrich investigations of contexts, their relations and their influence on markets, strategies, policies and consumer behavior, it is useful to capitalize on approaches and methods such as i.a. social cybernetics, computational social science, Big Data, Digital Humanities, Web Science, sustainability studies, simulation modelling, knowledge management and transition management, psychology and biosciences. It goes without saying that ICTs play a crucial role in knowledge building in many disciplines and research areas.

ICTs with its revolutionary transformative power should respond – as much as possible – to problems of societies, organizations (not only industries, banks, military and public administration) and individuals, both in the real as well as the virtual world. These technologies produce new surroundings, they create new contexts and transform old ones. On the other hand, they are also *context-dependent*. Any strategy, decision, action or behavior should consider this feedback. It may – if properly approached, evaluated, and applied in practice – increase ICTs’ dynamics and effectiveness. The “context paradigm” may prove its viability and benefit also in the long term. It has no ambition or capacity to create any ideal model of context, but aims to recognize and improve efficacy of ICTs’ development, applications and diffusion (be it particular, local, at the national or

global level). In order to make this development process more reflexive, it has to take complexity, diversity, ambivalence, risks and possible negative side effects into consideration.

References

- Babauta, L. (2012), *The Effortless Life*, Brilliance Audio.
- Babcock, B. (2001), *Cyborgs and nomads: a vision of identity for the information age*, Stanford: Stanford University Press.
- Barabasi, A.-L. (2012, September 28), 'Conversation: Thinking in network terms', *Edge* (Retrieved from <http://edge.org/event/special/-computational-social-science>).
- Carr, N. (2011), *The shallows: What the Internet is doing to our brains*, New York/London: Norton.
- Featherstone, M. (2000), 'Technologies of Post-human Development and the Potential for Global Citizenship', in K. N. Pieterse (Ed.), *Global Futures – Shaping Globalization*, London/New York: Zed Books.
- Danecki, J. (Ed.) (1993), *Insights into maldevelopment – Reconsidering the idea of progress*, Warsaw: The University of Warsaw.
- Friberg, M., Hettne, B., & Tamm, G. (1993), 'The contextual approach and the search for universal paradigm' in J. Danecki (Ed.), *Insights into maldevelopment – Reconsidering the idea of progress*, Warsaw: The University of Warsaw.
- Fuchs, Ch. (2008), *Internet and Society – Social Theory in the Information Age*, New York/London: Routledge.
- Grin, J., Rotmans, J., & Schot, J. (2010), *Transition to sustainable development*. New York/London: Routledge.
- Jay, F. (2010), *The Joy of Less. A Minimalist Living Guide*, Medford, NJ: Anja Press.
- Keen, A. (2007), *Cult of the amateur: how today's Internet is killing our culture*, New York: Doubleday.
- Keen, A. (2012), *Digital vertigo: how today's online social revolution is dividing, diminishing and disorienting us*, New York: St. Martin's Press.
- Kurzweil, R. (2005), *The Singularity is Near, When Humans Transcend Biology*, New York: Viking-Penguin.
- Lanier, J. (2011), *You are not a gadget: A Manifesto*, New York: Vintage.
- Loorbach, D. (2007), *Transition Management*, Utrecht: International Books.

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- Loreau, D. (2005), *L'art de la simplicité, simplifier sa vie, c'est l'enrichir*, Paris: Éditions Robert Laffont.
- Lyon, D. (2001), *Surveillance Society: Monitoring Everyday Life*, Buckingham/Philadelphia: Open University Press.
- McCormack, N. (2013), 'Are e-books making us stupid? Why electronic collections mean trouble for libraries and their patrons', *International Journal of Digital Library Systems* (Retrieved on Jan. 23 from igi-global.com@mail323.us3.mcdlv.net).
- Sartori, G. (1999), *Homo videns*, Roma/ Bari: Gius, Laterza & Figli.
- Small, G., Vorgan, G. (2008), *iBrain: surviving the technological alteration of the modern mind*, New York: HarperCollins.
- Tapscott, D. (Ed.) (1998), *Blueprint to the Digital Economy: Wealth Creation in the Era of E-business*, New York: McGraw – Hill.
- Tapscott, D. (2009), *Grown up Digital: How the Net Generation is Changing Our World*, New York: McGraw-Hill.
- Tapscott, D., Williams, A. D. (2010), *Wikinomics: Rebooting Business and the World*, London-New York: Penguin.
- Turkle, S. (2011), *Alone together*, New York: Basic Books.
- Zacher, L. W. (2007), 'E-transformations of Societies' in A. Veikki-Antiroiko (Ed.), *Electronic Government: Concepts, Methodologies, Tools and Applications*, Hershey/ New York, Information Science Reference (IGI Global), Vol. 6, Chapt. 8.5, p. 3754-3763.
- Zacher, L. W. (2009), 'Socio-Cultural Context of E-Government Readiness', *International Journal of Information-Communication Technologies and Human Development*, 1(2), April-June, p. 94-109.
- Zacher, L. W. (2012), 'Society, Market and Technology Nexus as Contexts of ICT Policies and Applications: Some Issues and Reflections', *International Journal of Information – Communication Technologies and Human Development*, 4(3), July-September, p. 32-42

Annex

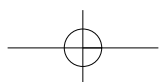
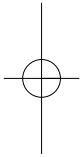
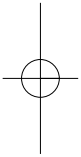


Figure 3. ICTs: Toward a desirable change (A conceptual framework).

