ВОПРОСЫ ИСТОРИИ, ТЕОРИИ И МЕТОДОЛОГИИ

From formal rationality to the digital one: Side-effects, ambivalences, and vulnerabilities*

S.A. Kravchenko

Moscow State University of International Relations
Vernadskpgo Prosp., 76, Moscow, 119454, Russia

Institute of Sociology of FCTAS RAS
Krzhizahanovskogo St., 24/35–5, Moscow, 117218, Russia
(e-mail: sociol7@yandex.ru)

Abstract. The article considers challenges for man, society and nature, which appeared under the new types of rationality and bring not only the desired achievements but also unintended consequences in the form of side-effects, ambivalences, and vulnerabilities that become more complex. Thus, formal rationality became a factor of transition from traditional societies to industrial ones, which facilitated the establishment of high standards of living, but at the same time had side-effects such as the 'iron cage' of bureaucratization that made social relationships impersonal and without binding values. The growing formal rationality produced more complex side-effects such as 'legitimation crisis', 'colonization' of the essential functions of people's life-worlds, and dependence on legal and administrative bureaucracies. Formal rationality led to ambivalences: rationalization helped people to adapt to the dynamics of social life but also had irrational consequences — achievements in scientific knowledge and technologies advanced beyond moral limits. Formal rationality gave birth to 'society of normalization' and biopower which generated the system of total control in the form of the Panapticon spreading its influence throughout the whole society. McDonaldization as a form of modern formal rationality worsened the situation by producing globally dehumanized nothings. Digital rationality creates objective conditions for complex vulnerabilities to society and nature in the form of 'normal accidents' and 'collateral damage'. The author argues that digital rationality acquires two basic types that are culturally determined: pragmatic type — hybrid rationality rooted in the principles of practical, formal, instrumental rationality and McDonaldization; substantive digital type with an emphasis on human needs and ontological safety. To minimize the vulnerabilities of the pragmatic digital rationality and to avoid the digital 'iron cage', the author suggests: rejection of radicalism and pragmatism in relation to digital technologies and artificial intelligence; humanistic modernization; eco-digital policy; interdisciplinary research of complex nonlinear vulnerabilities.

Key words: rationality, global complexity, nonlinearity, side-effects, ambivalences, vulnerabilities, dehumanization, the digital 'iron cage', humanism

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Rationality, like other social phenomena, develops due to the 'arrow of time' (I. Prigogine) and becomes more complex in its new types. Rationalization provides people with the desired goods and comforts but also with unintended consequences in the form of side-effects, ambivalences, and vulnerabilities. All rational systems produce certain irrationalities which limit or even undermine both rational manifestations and humanistic social practices. Today, digital rationality develops and changes the character of the earlier types of rationality, because it helps people to adapt to the global complexity and nonlinear development. However, it also produces new challenges for man, society, and nature.

The stronger formal rationality, the more complex its side-effects and ambivalences

Sociologists showed that growing rationality leads not only to the desired achievements but also to the unexpected side-effects. M. Weber identified four types of rationality: practical — detailed consideration of difficulties of adaptation to social reality and attitudes to them from purely egoistic interests to pragmatic positions; theoretical — cognition of the world by means of deduction, induction, revealing of causality, etc.; substantive — stipulates the human activity within the culturally significant values; and formal — distinguishes modern capitalism from other historical types of capitalism and implies the 'superiority of the West'. Weber insisted that modern capitalism has a specific rational ethos expressed in 'an attitude that, in a calling, seeks profit rationally and systematically'. However, Weber worried that rationalization would have side-effects such as the 'iron cage' of 'mechanized petrification': will the rational society consist of 'specialists without spirit' and 'sensualists without heart'? [27. P. 64, 182]. Moreover, Weber was one of the first scholars to argue that science as a significant factor of rationalization produces a threat to the individual autonomy, i.e., a 'caster of experts' should not confront people's conscience and values [26. P. 58]. He believed that formal rationality had both clear undoubted advantages and latent hidden dangers in the form of 'irrational elements', and under certain circumstances could transform into irrationality leading to disenchantment and the 'iron cage' of bureaucracy. Indeed, formal rationality contains a predisposition to produce side-effects by replacing humans with technologies (bureaucratic rules) and minimizing the factor of reason.

Since Weber's time, the development of formal rationality has produced complex side-effects that become especially evident in the middle of the 20th century. Weber considered rationalization in terms of individual purposive-rational action within economic, political, and religious structures. Habermas identified two types of rationalization: "rationalization of action orientations and life-world structures" and "expansion of rationality, that is, complexity of action systems" [12. P. 145]. Thereby, there are such side-effects as 'legitimation crisis': markets and administrative systems, based on the achievements of science and technologies, function in accordance with instrumental rationality as a renewed type of formal rationality, and 'colonize' the essential functions of people's life-worlds. Children

are mainly socialized not in families and schools but by media; decision-making is determined by the market system; mutual social dependence is replaced by the dependence on legal and administrative bureaucracies; there is no more a goal of collaborative understanding [11]. To minimize side-effects of rationalization, Habermas insists on developing communicative actions, non-institutionalized opinion, and public discussions of economic and political issues [10].

Further development of formal rationality led to complicating ambivalences. According to Mannheim, rationalization becomes more complex, which produced ambivalences: on the one hand, rationalization helps people to better and more easily adapt to the dynamics of social life; on the other hand, there are irrational consequences due to the effect of 'contemporaneity of the non-contemporaneous, and unbalanced development of different areas of life of both individuals and social groups. This, "technological and natural scientific knowledge has advanced beyond moral powers and insight into the working of social forces… in none of the more complex societies is the good judgment and morality necessary for mastering social and economic problems equally distributed among all groups and classes", which brings a new challenge for the contemporary society: it cannot stand "the general lack of rationality and morality in the control of the total process, and their unequal social distribution will not allow it to go on» [21. P. 41, 43, 44]. However, according to Mannheim, irrationality in the form of sublimations can act as a powerful impulse to create cultural values or enhance the joy of life, which is reflected in sports and festivities. If irrationality is not socially structured, it is dysfunctional, which can be manifested in the 'negative democracy': "democracy itself produces its own antithesis and even provides its enemies with their weapons… Democratization is similar, in this regard, to other achievements of modern technique, the radio and the press, in that it can produce destructive as well as constructive results, according to the direction in which it is guided… Democracy in this sense is a means of radiating social influences which can work in a morally destructive, as well as in a constructive way" [21. P. 71]. Democracy, like other life realities, is based on principles of formal rationality and pragmatism; therefore, it generates complicating ambivalent consequences for both society and nature.

Foucault links the development of formal rationality with the birth of 'society of normalization' [8. P. 107], which implies control of individuals and division of social groups (poor, unemployed and mad) according to certain forms of knowledge. In modern societies, the discourse of knowledge represents biopower that can take the form of all relationships — in fact, the power-knowledge over everybody's life. Therefore, power produces knowledge, and knowledge as power produces the truth about what should be considered as a 'rational order'. So, there are new rationalities that set disciplinary forms of social control, the legitimacy of which is determined by the unity of knowledge and power. As a result, there are more complex ambivalences. On the one hand, the disciplinary power based on the triumph of rationality contributes to minimizing some dangers and social deviations. On the other hand, the triumph of rationality latently generates irrationality in the form of various others —

'sick', 'insane', 'outsiders', 'marginal' — on whom social control is focused. Rationalization and bureaucratization of the system of control (the Panopticon as an ideal system of gathering information) led to dehumanization: the process that began in prisons later spread to hospitals and army, schools and universities, throughout the whole society, and formed a 'carceral net' that covered the 'entire social body' [7. P. 290]. The disciplinary power makes social institutions dysfunctional, because they risk to be left without individuals, who are displaced by alienated, disciplinary individuals imprisoned the complex rational 'iron cage'.

At the same time, Foucault is optimistic about the future and predicts the replacement of 'society of normalization' by a society of more humane principles with the idea of 'governmentality' (governance + mentality). According to Foucault, governmental rationality allows to combine optimally rationality of various power structures and individuals' truths relying on their self-rationalization, self-discipline, and self-reflexing that implies active organization of human subjectivity in both social and material worlds [5; 6]. Followers of Foucault name two key directions for the development of governmental rationality: 1) social practices in the form of voluntary self-actualization of individuals' power over themselves (fitness clubs, medical centers for diet nutrition, beauty, etc.); 2) rational perception of new challenges produced by the rationalizing society, technology, and nature [19].

Ritzer made an important contribution by defining McDonaldization as a form of modern formal rationality which produces nothing: "a social form that is generally centrally conceived, controlled, and comparatively devoid of distinctive substantive content… There are dynamics pushing in the direction of the ever-greater global proliferation of nothing" [24. P. 3, 5]. Nothing is especially expressed in empty social forms such as non-places, non-things, non-people, and non-service. Even "in the realm of higher education, the textbook falls toward non-thing": "instead of having to read many books, or experts from them, the student is given a textbook that offers the authors' summaries of those books"; routine medical procedures and such extreme things as heart transplants are "examples of nothing" [24. P. 175]. McDonaldization produces ambivalences with complex effects of dehumanization. On the one hand, it provides a high average standard of knowledge and reduces risks of unqualified education and treatment. On the other hand, essential elements of this type of rationality are complex effects of irrational rationality manifested in dehumanized relationships, alienation of human mind: "The main reason to think of McDonaldization as irrational, and ultimately unreasonable, is that it tends to be dehumanizing" [25. P. 134]. Interaction between professors and students is minimized, and creative discussions are increasingly replaced by formalal control and tests. Medical care is also dehumanized: patients feel themselves as parts of a medical conveyor belt. The time spent on tests significantly increased, and the time spent on communication with doctors decreased. Many treatments, especially operations of conveyor type, are based on costs reduction, which consequently deteriorates the quality of medical care. Parents and children communicate less with; reading at night is replaced by watching movies or playing computer games. The online university

moves towards the nothing: "Internet universities are likely to closely resemble one another with the result that not one of them can have much in the way of uniqueness". Moreover, McDonaldization has a negative impact on the authentic environment and produces Disney's worlds as "non-places, and all of them are awash with a wide range of non-things (such as mouse-ear hats), staffed by non-people (the cast members, in costume or out), who offer non-services" [24. P. 33, 101]. However, deMcDonaldization also develops: Web 2.0 reduces irrationalities, especially dehumanization, in comparison to Web 1.0 [24. P. 184].

There is also an emerging type of reflexive rationality in the form of game-ization that produces complex ambivalences in society and thinking. It implies a combination of professional activity and principles of the game, which, under nonlinear uncertainties, allows to achieve public goals effectively [17. P. 12–18]. The game-izated practices became a part of our life: in the economic sphere, there are payments, purchases, credits, etc. in game forms; political performances allow to get 'the second body of the king' [13]; television produces 'stars'; game-meetings became an integral part of international summits and diplomatic relations; the military performs specific games. Almost everybody participates in game-ization not just for fun but for pursuing pragmatic goals. Irrational and dehumanized effects of game-ization are manifested in the fact that many individuals need a spirit of passion and become psychologically dependent on a happy chance.

Digital rationality as a production of more complex vulnerabilities

Development of digital rationality means introduction of principles of artificial intelligence into all spheres of human life, including socialization, education, labor, health care, and online communication. Digitalization is an objectively demanded phenomenon which appeared under the nonlinear dynamics of rationalization, achievements and side-effects of science and technologies, ambivalences of artificial intellect. In its turn, digitalization makes a significant contribution to the nonlinear transformation of reality and provides actors with the ability of self-reflection and self-improvement. However, digitalization generates social practices with intra-systemic uncertainty, which creates objective conditions for complex vulnerabilities for society and nature. 'Smart machines' and artificial intelligence as complex systems are capable of self-reflection and manifesting their own 'will', i.e., they can get out of the human control. Thus, digital rationality contributes to the spread of vulnerabilities in the form of 'normal accidents' — disasters that, according to Perrow, are determined by complex social-technical systems which periodically 'normally' fail. Obviously, there are no simple solutions for vulnerabilities, because there are no 'objective laws' of mankind prosperity. However, some approaches can minimize vulnerabilities: scientific and technological innovations which involve the dispersal of energy concentrations and population in the areas of 'normal accidents'; deconcentration of economic and political power, and improved coordination and cooperation of security services; managed openness to prevent terrorist threats; transition to an effective security culture [23]. Just an example of digital vulnerability:

the 'independent initiative' of a supercomputer in the new-generation passenger Boeing, designed to replace the pilot, has led to two catastrophes.

Bauman also argues that rationalization is prone to latently produce 'collateral damage' [1]. Not so long ago 'collateral damage' referred only to the military sphere; however, under the 'liquid modernity', due to its structural and functional complexity, unintended negative effects of human innovation activity entered everyday social life. In particular, 'collateral damage' is manifested in the existential insecurity of life under the 'liquid fear' [2], and the need for security becomes a 'pathological dependency'. This type of insecurity is especially evident in technological innovations of the contemporary big city, which implies the ambivalent symbiosis of mixophobia ("a highly predictable and widespread reaction to the mind-boggling, spine-chilling and nerve-breaking variety of human types and lifestyles") and mixophilia ("the bigger the city the more likely it is to attract a growing number of people") [3. P. 86, 89]. Nevertheless, 'normal accidents' and 'collateral damage' should not be regarded as inevitable factors facilitating the spread potential disasters. People need a systematic monitoring of increasingly complex institutional systems to identify their dehumanizing effect and to at least minimize negative consequences of this effect.

Digital rationality includes the following basic components: artificial intelligence functioning as a kind of 'non-human actant' [18], so that social actors acquire new statuses, perform social roles online, and adapt to the global complexity and nonlinear reality; transmission mechanism to manage increasingly complex ambivalences and vulnerabilities; digital communications integrating all forms of media and used for interaction between human actors and non-human actants; means to reenchant the world — to minimize effects of excesses, especially simulations, in the contemporary life.

Vulnerabilities of digitalization differ, which is evident in national approaches to overcoming the covid-19 pandemic. The pragmatic type of digital rationality is essentially hybrid and rooted in the principles of practical, formal, instrumental rationalities and McDonaldization. All these rational practices have elements of efficiency, calculability, predictability and control. Digital rationality can be measured by the same criteria but more complex. Thus, if previously efficiency was associated with the division of labor (Durkheim) and its professionalization (Weber), today it is manifested in the integral use of human and artificial intelligence, which allows for much faster actions in the 'space of continuity' and 'timeless time' [4. P. xxxi, xl]. For instance, challenges of covid-19 led to learning and working on-line, to distant counselling and treatment, which are both attractive and useful. However, such efficiency is vulnerable and can turn into inefficiency. Thus, the spread of digital communication reduces symbolic exchange; digitalization undermines the foundations of many traditional professions and destroys the latent function of the household management — strengthening the family. Calculability focuses not so much on the material quantity of goods and services as on the quality of information provided and on the per-minute cost of

using the digital content. In cloud computing, the quantity of data has become the equivalent of quality: Big Data on consumer demands, electoral choices, prevailing diseases, etc., became a valid basis for decisions and actions. Predictability has also become more important than for formal rationality and McDonaldization — functionality of human actors and non-human actants is optimal, regardless of time and place, when and where they act. The success of banks, Internet commerce enterprises, etc., working on digital principles, is manifested in the fact that people feel comfortable in the chaotic world at the local level of everyday life, and failures of digital technologies are very rare. If the McDonaldized control is local and limited in time and menu, the digital control of artificial intelligence is almost global and has almost no human factor. The Internet market controls the supply of goods from all over the world and offers an almost unlimited variety. However, this type of control is carried out in the form of digital surveillance which becomes more widespread and developed like the Panopticon. Without a transition to real digital rationality the digital surveillance might become a nightmare.

Digital rationality presupposes a vulnerable lifestyle that implies a paradoxical synthesis of social and digital, real and virtual, rational and irrational. Many individuals try to delegate their thinking and self-reflection to artificial intelligence. Successful practices of this digital 'dependency' are socially constructed and incorporated into social activities — economic, political and cultural structures. Digital rationality facilitates the perception of complex and nonlinear realities, expands the number of goods and services for millions of people. Actors using artificial intelligence can take part in activities regardless of their location. The time to achieve the desired goals is drastically reduced. Digitalization promotes the affirmation of such defense mechanisms as displacement, denial and sublimation. In particular, it allows not to think about risks and vulnerabilities as inevitable dangers. For many individuals, the ability to use gadgets, digital 'procedures' becomes a condition for adapting to nonlinear development. Today, all kinds of digital networks develop, in which complicated exchanges take place, which creates a specific digital-network of rationality. Thus, 'useful connections' in business and politics, related to cloud computing, dramatically increase the functionality of individuals and collective actors (with 'digital bodies') under the growing uncertainty.

However, there are specific vulnerabilities when using digital resources. Not every individual is ready to rely on 'smart' machines due to not feeling ontological safety. According to Mosco, "people work alongside as assistants to robots and other intelligent devices smart tools... Increasingly, people give up most, if not all, control of autonomous vehicles and to the algorithms that are now trusted to make decisions in business, management, and social life… we tend to ignore that most people, both at and away from work, will establish relationships, including strong emotional tones, with intelligent devices". Mass unemployment becomes an 'opportunity' because "living labor, as Marx called it, is rapidly being overtaken by the dead labor of machines". Moreover, despite their efficiency, digital systems are "extremely vulnerable to attacks from hackers" [22. P. 54, 173, 177].

According to Greenfield, creation of 'digital cities' implies both the desired innovations and vulnerabilities of 'normal accidents' and latent 'collateral damage' which traumatize the public consciousness and the personal emotional sphere: computers "alter our brain", and real empathy becomes almost impossible without a face-to-face contact and body language [9]. Digital rationality seems to replace human beings with technologies and to minimize the human factor that makes some professions functionally unnecessary. Certainly, much depends on the people — on the choice between pragmatic and humanistic types of digitalization.

Digital transformation would not create a new secular religion on the myths about 'omnipotence' of the digital progress and 'universality' of digital rationality that can lead to social happiness and prosperity. It is necessary to consider the limits of digital transformation for humanization. Digital 'unreasonableness' is especially evident in the higher education, when students feel themselves as objects injected with knowledge during online courses. Due to its technological nature, the pragmatic type of digitalization does not focus education on training humanistic creativity. Digital rationality often manifests itself in a kind of a 'liquid hybrid' of several irrational rationalities (instrumental rationality, 'iron cage' of rational control, McDonaldization). Some people begin to practice social actions associated with 'edgework' — voluntary risk-taking [20] — by relying on 'smart machines'. Digital rationality, which implies the increasing role of artificial intelligence, Big Data and cloud computing, minimizes some simple risks but produces unintended vulnerabilities — new manifestations of hybrid irrationalities that makes people respond in a certain way to non-linearity.

To a large extent, under digitalization, the world and Russia have crossed a certain threshold of dynamic complexity — there is already a complex social-digital-natural reality full of new attractive forms of life and benefits, but also of non-linearly developed forms of previous vulnerabilities and new complex vulnerabilities predisposed to nonlinear effects. Tendencies of non-linear development traumatize society and nature in the form of 'normal trauma' [16. P. 150–159]. The effects of 'normal traumas' can be caused by non-human actants — computer networks and digital clouds, which are complex systems that can get out of the human control. Thus, social-digital realities, including, in particular, 'smart machines' and 'digital cities', ensure not only the desired innovations but also increasing vulnerabilities in the form of 'normal traumas'. In addition, climate change affects 'normally' the economy, tourism, and everyday activities in general. It should be emphasized, that all these and other nonlinear vulnerabilities are directly or indirectly related to human activities in the digital sphere.

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Since digital rationality became a part of our life producing complex nonlinear vulnerabilities, it is necessary to develop adequate theoretical-methodological approaches to its study, which requires a fundamentally new model of thinking about social activity in order to avoid the 'iron cage' of digitalization. To minimize

consequences of complex nonlinear vulnerabilities determined by digital rationality, we need: the rejection of radicalism and pragmatism to digital technologies and artificial intelligence; the humanistic modernization focused on the development of social and human capital; the eco-digital policy based on the idea that nature is not just a living environment but an organic part of the social-natural reality (social-digital-natural hybrid realities); innovative approaches [14. P. 22–30] in the form of interdisciplinary research focused on complex nonlinear vulnerabilities.

It is impossible to eliminate vulnerabilities that are attributes of the global complexity and non-linear development, but their negative consequences can and should be minimized. Digital rationality can be humanized, and at least some vulnerabilities can be eliminated. Contemporary societies have a fundamentally new task — to make digitalization, especially of education, humanistic. The concept of the humanistic digital turn, which we develop, implies the integration of digital achievements for the preservation and reproduction of basic cultural values (friendship, love, patriotism, health and collectivity [15. P. 397–405]). The humanistic type of digitalization allows social actors to effectively interact within a specific social lifestyle full of meanings and humanist narratives that minimize the vulnerabilities of the pragmatic type of digitalization. The transition to the humanistic type of digital rationality would allow to overcome its negative side-effects, because the non-linear humanistic thinking takes into account realities of digitalization, discontinuities and traumas in order to find new forms of humanism focused on the existential human needs.

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От формальной к цифровой рациональности: побочные эффекты, амбивалентности и уязвимости*

С.А. Кравченко

Московский государственный институт международных отношений (университет)
Министерства иностранных дел Российской Федерации
просп. Вернадского, 76, Москва, 119454, Россия

Институт социологии ФНИСЦ РАН
ул. Кржижановского, 24/35, к. 5, Москва, 117218, Россия
(e-mail: sociol7@yandex.ru)

В статье анализируются вызовы человеку, обществу и природе, возникшие в результате появления новых видов рациональности — они приносят людям не только желаемые блага, но и непредвиденные последствия в виде побочных эффектов, амбивалентностей и уязвимостей, которые становятся все более сложными. Формальная рациональность была фактором перехода от традиционных обществ к индустриальным, что способствовало становлению высоких стандартов жизни, однако им сопутствовали побочные эффекты в виде «железной клетки» бюрократизации, что делала отношения людей обезличенными и лишенными связывающих ценностей. С течением времени развитие формальной рациональности порождало все более сложные побочные эффекты, выразившиеся в «кризисе легитимации», «колонизации» основных функций жизненных миров, утверждении зависимости от правовой и административной бюрократии. Продолжающееся развитие формальной рациональности порождает амбивалентность: рационализация помогает людям адаптироваться к динамике социальной жизни, но возникли иррациональные последствия — достижения в области научных знаний и технологий выходят за рамки моральных сдержек. Рационализм воспроизвел «общество нормализации» и биовласть, которые породили систему тотального надзора в виде

паноптикума, охватившего все общество. Макдональдизация — форма современной формальной рациональности — ухудшила ситуацию посредством глобального производства дегуманизированного ничто. Цифровая рациональность, основанная на принципах искусственного интеллекта, создает объективные условия для сложных уязвимостей в виде «нормальных аварий» и «сопутствующего ущерба». Автор утверждает, что цифровая рациональность обретает два основных типа, которые культурно детерминированы: прагматический тип — гибридная рациональность, коренящаяся в принципах практической, формальной, инструментальной рациональности и макдональдизации; субстантивный цифровой тип — рациональность, акцентирующая значимость человеческих потребностей и онтологической безопасности. Для сведения к минимуму последствий уязвимостей цифровой рациональности прагматического типа и избегания вхождения в «железную клетку» цифровизации предложены: отказ от радикализма и прагматизма в отношении цифровых технологий и искусственного интеллекта; гуманистически ориентированная модернизация; экоцифровая политика; междисциплинарные исследования, нацеленные на изучение сложных уязвимостей нелинейного типа.

Ключевые слова: рациональность; глобальная сложность; нелинейность; побочные эффекты; амбивалентность; уязвимости; дегуманизация; «железная клетка» цифровизации; гуманизм