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SCIENTIFIC AND TECHNOLOGICAL PROGRESS AND TRANSFORMATION OF SOCIETY: NOONOMY AND NOOSOCIETY. PART 2^{1, 2}

Abstract: the theory of Noonomy, based on the study of modern trends in technological and socio-economic development, allows us to identify the causes of the contradictions that modern civilization faces – economic, social, environmental, moral contradictions. However, noonomy not only reveals the background of these contradictions, but also shows the maturing objective possibilities of getting out of these contradictions, overcoming civilizational dead ends, choosing a path at civilizational forks. The opportunities created by modern technology create the prospect of a transition from economics to noonomy, which means abandoning economic rationality, leading to an unrestrained pursuit of increasing production and consumption. The place of economic rationality is occupied by rationality based on the criteria of knowledge and culture. However, such a transition from economics to noonomy should be based on a change in the totality of social relations, and noonomy can be strengthened only within the framework of an integral system of the noosociety. The very nature of public relations and public relations of people, the nature of human socialization and socialization of society will orient social development to these new criteria. The ideological orientation of such a reformatting of society can be the ideology of solidarity, which grows out of the emerging opportunities to overcome the discord of socio-economic interests of people based on the struggle for material resources.

Keywords: noonomy, noosociety, civilization, needs, knowledge, planning, culture, socialization, solidarity.

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科学技术进步和社会转型:智力经济和智力社会(第一部分)

摘要:基于对当前技术和社会经济发展趋势的研究,运用智力经济学理论我们能够确定产生现代文明所面临的矛盾的原因,包括经济、社会、环境和道德方面的矛盾。智力经济学不仅揭示了这些矛盾的背景,而且还显示出克服这些矛盾、走出文明死胡同、在文明发展的十字路口选择正确道路的客观可能性,这种可能性正走向成熟。现代技术为所有权范式变化以及从传统经济到智力经济的过渡带来了机会和前景,这意味着摆脱对经济合理性的追求——这种追求导致无限制地增加生产和消费,经济合理性被基于知识和文化标准的合理性所取代。但这种从传统经济到智力经济的过渡依赖于整个社会关系的变化,而智力经济只有在智力社会的完整体系中才能得以巩固。人们的社会关系和社会联系的性质、人的社会化和社会的社会化的性质决定社会发展将面向这些新的知识和文化标准。随着人们对基于物质资源争夺的人们之间社会经济利益不和谐的克服,团结主义的意识形态将成为这种社会重塑进程的指导思想。

关键词:智力经济、智力社会、文明、需求、知识、计划、文化、社会化、团结主义。

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Economic society at a standstill

Many researchers agree that current trends in civilisational development are far from optimal, both in terms of developmental goals, developmental mechanisms and possible predictable outcomes.

What is driving people down the current – suboptimal and perhaps even catastrophic – path? – An economic system in which, according to fundamental market principles and tenets, profit at any price is paramount.

Today, it is mainly the promotion of simulative, unnecessary goods in the name of profit. The increase in the production of such goods leads to the destruction of nature (often without satisfying people’s real needs), etc. But it is hard to speak of rationality, even if market economists and experts who serve them think that this economic principle is rational (read any economics textbook or other textbooks that talk a lot about how “rational” or “irrational” this or that behaviour is; they usually talk about the behaviour of economic actors in a market environment and a corresponding notion of “rationality”).

In reality, “rationality” and “reason” are two different things. Reason and knowledge have a very complex relationship. Our reason, in the criterion base, which is formed on the basis of knowledge, is also formed on the basis of knowledge. That is, reason is both a part of knowledge that enables us to judge the conformity of that part to a criterion base, and a part of knowledge that forms the criterion base itself. Something is reasonable or not reasonable within a certain criterial framework. “Noos” also has its criterion base. But this “noo” basis is much broader and not utilitarian; moreover, it changes with the acquisition of new knowledge.

The standard of reason has been spoken of allegorically since antiquity. Thus, already in the eleventh century, Metropolitan Hilarion wrote in his Epistle on the Law and Grace: “Into the true mind he brought” [Slovo..., 2011, p. 70], i.e. the criterion of reason is truth, a certain permanent and conscious value; and the “circle” of knowledge defined by this criterion is the “light of reason”, the rest is darkness! This is how the Greek word *noos* is understood in its deeper meaning. Its translation into Latin as “ratio” is inaccurate, because ratio is the conformity of something (a kind of knowledge) to any (!) chosen criterion, and this something does not have to be “light” and “true”.».

Where does this framework of rationality come from? The framework is a kind of criterion base formed by ourselves. At the expense of what? By knowing certain things, being aware of them and forming corresponding “boundary posts”: Here you can go and there you cannot; here the limits of rationality are crossed.

We should note, however, that “rationality” is not absolute. This coordinate system or system of criteria is dynamic. As we expand our knowledge, this space expands and so does our knowledge of the criteria base. Accordingly, its boundaries and criteria also expand. Each level, each system has its own “rationality”. And what was “rationality” yesterday may turn out to be “non-rationality” today.

At the heart of it all is the capacity for ever more knowledge. Within the framework of what? To satisfy their needs, including the need for new knowledge; to know what is “good” and that its limits can be “exceeded”. So knowledge is also at the core of this phenomenon. This is the crucial aspect of the problem that allows us to understand how the world works and why it goes “crazy”: because going beyond these limits is “crazy” and goes beyond previous “rationality”. And that is why often (and especially now) all the scientific truths and approaches we have studied for years turn out to be completely unsuitable for analysing the future in general – to understand the future, to become aware of ourselves.

In recent years, economic science began to “guess” that human beings are by no means guided in their lives by the textbook “curves of indifference” and tried again to believe in the harmony of real trends with the algebra of formulae and graphs trends in the – qualitative! – development of society. They often speak of the “bounded” rationality of people. However, this is in fact a limited view of the problem: human beings are not a mechanical apparatus to which even market rationality imposes limits; they are richer and capable of making decisions based on various criteria, including non-market criteria.

In Noonomy, the new character of rationality and the consequent redefinition of development goals are of utmost importance. This is because Noonomy is based on the transition from a growth paradigm based on economic “rationality” and oriented towards the increase of volumetric value indicators to a development paradigm based on the achievement of specific goals that meet various human needs and are formed on the basis of higher values – in the future: noo-values.

In a market economy, rationality is understood as maximising money income. Of course, neoclassical economic theory argues that it does not reduce the issue to money, that it is human nature to maximise the receipt of any goods – but they are only really considered if they are given a monetary value. Only recently, under pressure from behavioural economics research, has neoclassicism softened its stance somewhat and conceded that humans are not programmed utility and loss calculators, that they can be driven by other motives and that their economic decisions can be influenced by non-economic factors. However, all this is interpreted as man’s “bounded

rationality” or reduced to a “recalculation” according to the criteria of such “rationality”. That is, “real” rationality is still seen as a calculation of benefits and losses (often “non-economic factors of economic growth” etc. are considered in this sense), and man is imperfect, his ability to behave rationally is limited by many external factors.

Let us assume that the economy is rational in its own way (or strives for rationality), but is it reasonable? Do the actors in current economic activity act unconditionally rationally (from the point of view of the criteria basis of the existing economy)? The answer is obvious.

Moreover, “ratio” (as opposed to reason) has nothing to do with knowledge of new knowledge. So when we talk about “Noonomy”, we are talking about moving to a fundamentally different critical framework, to some specific principles based on “noo”, about the way people fulfil their needs. Yes, growing, changing, but nooneeds. This is a particular way of doing things, a “noo power” if you will. Just as economy is the way of economic society, Noonomy is the way of non-economic society.

Noonomy is not about the private pursuit of profit or other income achieved through the chaotic play of market forces, but about the rational pursuit of certain needs that are deemed reasonable – truly reasonable. Accordingly, the degree of satiation of these reasonable needs, nooneeds, functions as the specific goal of production. This presupposes a specific programme of action that helps to overcome the chaos of the market and give production a more planned, more orderly character. This approach does not exclude elements of chance or the freedom of individual choice, which is not constrained by prescriptions from above. It is important that the elaborated production programme is flexible and can adapt to changing conditions and random disturbances.

But back to the hard realities. We now live in an economic society that has repeatedly proved that it can drive civilisation into crisis. There is no denying that economic rationality has been a powerful engine of economic development in certain periods (when it met the criteria of social development). But this development, in one way or another, has always led to crises when people have done things that do not correspond to the criteria of rationality that lie beyond the economy.

Transition to Noonomy

How can the contradictions described be overcome? It is about the transition to a stage of intelligent economic activity, the noo stage.

In this stage, nooproduct, which is separate from man, from society, remains subordinate to society in its aims and tasks. With the development of society, the expansion of the criteria for evaluating the rationality of behaviour through the introduction of new values and the transition to nooproduct and nooneed, the transition from economic rationality to a new rationality takes place; this new rationality and the associated redefinition of development goals become primary and serve as the basis for changing the character of social relations.

Noonomy takes the place of economics. Noonomy is based on a non-economic way of satisfying human needs; they are characterised by a new quality of production in which the human being is, as Marx imagined, “beyond material production”.

Noonomy, we want to emphasise again, implies a different way of doing business and a different way of valuing needs – not based on the “old” rationality, but based on reason, on understanding the true consequences of economic decisions and the true value of the needs to be satisfied. So it is not about economics, not about the rational, pleasure-maximising individual, but about a

different kind of need formation and satisfaction that can be called *nooneeds*. Once, for example in the age of gathering, man fulfilled his needs entirely without economic calculation.

Noonomy as the material basis for the satisfaction of human needs in noosociety is an orderly world economy, a way of satisfying needs in a society where there is no “relation to production” and no “production relations”, no “relation to property” and no “property relations”, no economy and economy is impossible. *It is a non-economic way of not satisfying needs*. That is why, for example, it is wrong to speak of Noonomy as a kind of “noosphere economy”, “noosphere economics”, etc. (as some researchers do), it is an oxymoron, it is like speaking of a non-economic economy, a non-predator predator etc.

Of course, the movement towards Noonomy is a long historical transition. But it should be emphasised that the changes leading to the transition to the stage NIS.2 ultimately from economics to Noonomy, already entail changes in the short term in the economic relations, in the nature of property relations inherent in the new generation of industrial society.

Evolution of property relations

Even in the present phase of social development, before the transition to NIS.2, tendencies towards socialisation and expansion can be seen in the development of property relations. Property relations were supposed to give the owner the unchallengeable right to own, use and dispose of economic resources. However, the development of economic relations has led to the overgrowing of ownership through various encumbrances that ensure the social responsibility of the owner.

These include numerous easements that allow third parties to exercise the right to use the land within certain limits (right of way, right of access to water sources, right to drive livestock, right of access to coastline, right to lay communications, etc.). Numerous restrictions and encumbrances on property rights also apply to construction, transport and industrial activities; they are associated with obligations to ensure safety, quality standards, environmental requirements, etc. Special attention is paid to the development of intellectual property relations, which regulate the economic turnover of the most important resource of modern production – knowledge. We see phenomena such as crowdsourcing, wikinomics, free software, open source, copyleft, etc. All this leads to the development of regimes of free access to intellectual resources. On the other hand, there is a rather hard struggle to “lock in” intellectual property.

This corresponds to two trends in the development of property relations that can be traced in the modern economic system: 1) the preservation of established relations; 2) the erosion of property rights to the point of their complete abolition. And despite the continuing forces aimed at consolidating and preserving the first trend, it is the second that is gaining momentum.

The erosion of property rights is increasingly manifesting itself in various forms. This is clearly seen in the development of joint ownership and joint use of property, and in the separation of the functions of ownership and use. An owner can temporarily relinquish the use of a property and transfer the right of use to another person: renting, leasing, co-working, various forms of sharing (carsharing, kicksharing, bikesharing, timesharing, foodsharing, etc.). The turnover of the sharing economy represents a significant part of the global economy, exceeds one trillion dollars per year and is growing rapidly. In this sense, relationships that conform to the classical economic paradigm and develop into the same or similar sharing type become their own gravediggers – this is the inexorable logic of their development.

The transition to temporary use of property without the acquisition of rights of disposal (and often ownership) is largely determined by the increasing speed of technological change. It does not make economic sense to acquire full ownership of units that will be obsolete in a few years. It is not uncommon for the owner of such units to assume further obligations to the user for repairs and modifications.

Another trend that also leads to dilution of ownership is the fragmentation of capital. It is not for nothing that modern “property rights economics” focuses so much attention on the fragmentation and dilution of ownership. The emergence of shareholder ownership leads to an even more complex fragmentation of property rights. Shareholders no longer have full ownership of capital. Moreover, the totality of their rights depends on the type of shares and the volume of their share package. The functions of appropriation and disposition within the framework of ownership have also evolved greatly: already in the first half of the twentieth century, it became clear that these functions were divided between capital owners and managers. These issues had already been raised by a number of researchers (Thorstein Veblen [Veblen, 1921], Adolf Berle and Gardiner Means [Berle, Gardiner, 1932], Stuart Chase [Chase, 1932]¹) even before James Burnham became famous as a pioneer, coining the distinctive term the ‘managerial revolution’ and claiming that capitalist society was being replaced by a managerial society [Burnham, 1941, p. 71].

In fact, the division of ownership functions is even more profound than the division between shareholder and manager. J.K. Galbraith has shown that already in the middle of the last century the use of capital was taken over by a whole army of specialists who form the “technostructure” of the company [Galbraith, 1969]. But that is not all. Indeed, the ultimate users of the elements of capital are all workers, even if each of them performs only a small “partial” function.

This gives little to the individual worker, but it does give rise to collective action, and the reality of this division of rights is obvious, for example in the case of collective agreements or strikes. Today, in the wake of technological progress, robots and artificial intelligence are taking the place of workers and employees.

What happens to property relations when a number of functions are transferred from humans to technical beings? For example, what about the user’s liability if a robot driver causes an accident? Responsibility for damage can be attributed to the owner, but responsibility for violating traffic rules? And there is a reason that attempts to regulate these processes are difficult – they override the fundamental processes of the increasing paradigm shift in ownership.

The use and even the disposal functions are gradually being ‘taken away’ from the individual, and the development in this direction will only accelerate. These processes, together with the noted tendency to reduce the value of property, are leading to changes in the property system and in the whole social structure. Noonomy theory predicts that in the NIS.2 phase, the sharing economy, the economy of shared and blurred property rights, will dominate.

Thus, the system of ownership changes significantly in the transition to NIS.2, which entails a change in the entire system of economic relations. The nature of the market changes – it is no longer the spontaneous fluctuation of market conditions, but the result of complex concerted actions between individuals who own different and intertwined elements of property rights. It is no coincidence that business people and economists are increasingly

¹ The title of S. Chase’s book, *The New Deal*, was used by F. Roosevelt Volume for his election programme.

discussing the concept of stakeholder capitalism, which reflects the growing dependence of corporate activity on the interests of various social groups: Workers, residents, consumers, environmentalists, etc.¹.

It will also change the nature of state regulation, which will be geared towards balancing the complex equilibrium of economic interests resulting from the new, as if out of nowhere, nature of ownership and the new modification of market relations.

Role of the individual in the nooproduction process

At this societal stage of development, what will be the relationship of man to the sphere of production?

At this new stage, nooproduction, separated from man, from society, will remain subordinate to society in its aims and tasks. It is the sphere of goal-setting, the formulation of goals and objectives, the control of the permissible means of their realisation in the technosphere – all this will remain in the sphere of human society's relations.

Autonomous techno-essence functioning in the sphere of nooproduction and capable of self-development will depend on human society, determine the limits of its self-development, block the directions that are not beneficial to society, and direct the functioning and development of nooproduction in the directions necessary for human development.

Human relations in relation to regulating the functioning of the technosphere cease to be productive when humans withdraw from the process of direct production. The time of labour as an activity determined by need and external expediency will be greatly reduced, and in its place will come free creative activity, largely directed towards the process of cognition.

But what criteria will be used to make decisions about the development of a relatively autonomous technosphere? What needs do people have, what goals do they pursue, what resources do they consider acceptable to use?

Let us state an important position of the theory of Noonomy that is worth paying close attention to. We emphasise that the construction envisaged in the theory of Noonomy can only emerge if people learn and master other knowledge in parallel with a certain knowledge (especially technological and other scientific knowledge). We speak of knowing the world as a world of culture, a world of reason and limited needs. Man in his time has emerged from nature – there are examples of man's natural "zoological" approach to satisfying his needs. It is said that man finds it difficult to overcome himself, to give up his attitudes: I want more today, now and so on. "No, no, no, we want today, no, no, we want now!". Hence this "zoo" approach. It was on the basis of this approach that the most important social institutions emerged, and this is one of the reasons for the emergence of the phenomenon of the state.

But in addition to the zoo, there is also reason, which means that there is a noo. Man is able to teach himself not to desire things that are harmful to him (drugs, gluttony, etc.). Millions of people use this approach on a micro level every day. A person needs to understand what is bad and what is good for him and society; what is in the interest of other people, what is bad and what is good for them. There are many examples of people giving up a lot, sacrificing everything, even

¹ At the World Economic Forum in Davos, representatives of 120 major corporations developed the concept of measuring firm participation in meeting the interests of such stakeholders. See: World Economic Forum website. URL: <https://www.weforum.org/reports/measuring-stakeholder-capitalism-towards-common-metrics-and-consistent-reporting-of-sustainable-value-creation>

their own lives, for humanistic reasons, because of needs of a different kind, because of nostalgia. And of course there are spiritual values and cultural needs that only grow with the development of the individual and of human society.

No one can deny that the phenomenon of culture has become the most important factor in human progress. P.S. Lemeshchenko [2010, p. 74] writes: "... We are talking about what seems to be a sphere far removed from the economy, such as culture, but which acts both as an institutional basis and, at the same time, as a result of the human economy. If an economic model contributes to the accumulation of cultural values and traditions, then it naturally tends to be relatively sustainable in the long run. And vice versa".

The idea that man is by nature an animal is totally unacceptable. The more he develops, the more he becomes a "noo-human" rather than a zoo human or even an organic human. Besides, it is a natural human development and a human need: choosing zoology would lead to degradation of the planet, destruction of habitats, and what kind of future would we give to our children? This is an important knowledge. It is sacred to the masses because of the overwhelming pressure of capital and the "rationality" of the market, but accessible to those who understand the true goals of development and the needs of society.

Nature of human activity and the nature of needs

The theory of Noonomy suggests that in the foreseeable future man will recognise the global need to change the trend of his development. And why? And why is this now becoming increasingly urgent?

Already the new industrial society of the second generation (NIS.2) is able to free people from work and offer a considerable increase in free time, but it will not immediately bring a similar "increase in happiness" – we must learn to use free time for self-development (elevation of spiritual needs, culture, etc.).

Hannah Arendt's scepticism is understandable, because she doubts that more free time will ensure human development, since, in her opinion, people tend to use this time for senseless consumption: "... the spare time of the *animal laborans* is never spent in anything but consumption, and the more time left to him, the greedier and more craving his appetites. That these appetites become more sophisticated, so that consumption is no longer restricted to the necessities but, on the contrary, mainly concentrates on the superfluities of life, does not change the character of this society, but harbors the grave danger that eventually no object of the world will be safe from consumption and annihilation through consumption." [Arendt, 1998, p.133]

Yes, under the social order we live in today (so-called capitalism and the market), this is exactly the case, for they only allow people time to consume everything they have produced during their working hours, and then to earn again and consume again, which stimulates them equally strongly to consume (increasingly simulatively) and to produce for the sake of that consumption.

Society can find a way out of this vicious circle, not through the ideology of asceticism, enforced rationing or restriction of consumption, nor through the advocacy of higher ideals. No, this way out is only possible through the development of objective preconditions. Education and awareness of the need for self-restraint can only play a role if these preconditions are in place. What are these preconditions?

First, they are changes in the nature of human activity: the transition to predominantly creative activity changes the structure of human needs and shifts priorities from the intake of more

and more material goods to means for the development of the human personality, its creative potential.

Second, as people engage more in creative work, they learn more about the world, and their knowledge of where the boundaries are between what is reasonable in production and consumption expands.

Third, as technology develops, the possibilities for satisfying the needs of human life grow, the satiation of those needs to a level where the struggle to satisfy them, the fear of under-consumption, is no longer a primary problem.

The interplay of these three factors makes self-restraint not only desirable but also possible. When we use the term self-restraint, we emphasise that it is not an exact definition. We are talking about a broader concept, namely the self-definition of the human being as a rational person. By defining oneself in this way, one draws a boundary – what is reasonable here and now and what lies beyond reason.

It is not a question of imposing any behavioural stereotypes, not of forcing (mentally or physically) a certain asceticism, but of creating conditions under which man himself shifts the criteria of rationality towards a more reasonable attitude towards consumption, towards the natural environment, towards himself.

The possibility of such a change in the criteria of rationality is already established with the change in the nature of activity, by involving people in knowledge of the world around them, in the creative transformation of the conditions of production and of life in general, thereby changing the motives of their consumption behaviour. This path has not yet been passed, since this kind of activity does not cover the majority of production participants. But an obvious and steady trend is the increasing proportion of workers involved in cognitive processes and in creative, innovative activities. This trend is driven by the transition to increasingly complex technological modes that require deeper knowledge and a broader dispersion of creative activities in production.

Creative worker and the human potential of production

The current state of technological development is characterised by the spread of the 5th technological stage and the emergence and growth of the 6th (see: “On Strategy...”, 2011). These technological stages were formed and developed on the basis of the results of basic scientific research. Therefore, with the emergence of the 5th stage, the term “scientific-technological revolution” became popular. The period of its emergence and development was characterised by a significant increase in the share of basic and applied scientific research, experimental development and the cost of these purposes in GDP, as well as an increase in the number of people working in research and development. In the US, this growth was evident throughout the 20th century and became particularly intense in the post-war period. For example, R&D spending in the United States increased from \$19 billion to \$110 billion between 1953 and 1991 [Mowery, 1995, pp. 154, 166; Usselman, 2013].

At USSR similar processes took place, which intensified in the post-war period and led to a noticeable increase in the share of USSR in global R&D expenditure. However, from the late 1960s onwards, the growth rate of R&D expenditure on USSR began to decline, while the quantitative growth of research personnel did not slow down. This caused USSR to fall behind a number of developed countries in scientific and technological competition [Allakhverdian, 2014].

The attention to research and development was not only based on military and technical rivalry between the great powers, but also had a strong economic rationale. As early as the 1950s, research by Robert Solow showed the significant impact of technical progress on productivity growth [Solow, 1957]. Further research by Paul Romer [Romer, 1990; Romer, 1994] and other economists [Manyika, Pachtod and Park, 2011] only reinforced Solow's conclusions. Technological progress required a substantial increase in the share of the workforce not only in R&D, engineering and design, but also an increase in the skilled workforce capable of both generating and absorbing innovation. This underpinned the trend towards a massive shift from a predominantly routine performing activities to a more creative workforce.

The special role of the creative worker in the modern economy leads us to consider him not only as a labour force paid at market rates, but also as a unique resource that can significantly increase the profitability of the enterprise. Thus, Z.R. Khabibullina states, "In some areas of employment (especially in high-tech and knowledge-intensive sectors) one can observe a situation where the creative potential of a modern worker is identified with a unique resource of high economic value." [Khabibullina, 2020, p. 33]. As a result, the level of such a worker's wage goes beyond the normal level. Mainstream economic theory considers such an additional wage as a gain from some "human capital".

This concept was introduced by Jacob Mincer in 1958. He formulated his views in the following way: "We can think of the set of occupations among which the labor force is divided as constituting a hierarchy ranging from occupations requiring little training up to highly specialized occupations whose practice presupposes a great deal of investment in human capital [Mincer, 1958, pp. 291-292]. In fact, he identified labour, previously considered a separate factor of production (along with capital and land), with capital [Mincer, 1958, p. 299]. In his article he mentions human capital several times, but nowhere gives a definition of this category. It is clear from the context that he identifies it either with the opportunity costs of training [ibid., pp. 288, 301] or with the professionally trained labour force itself [ibid., p. 299].

An attempt at a strict definition of human capital was made by Theodore Schultz. However, after raising the question of how to distinguish human consumption from human investment in human capital, Schultz never offered a clear criterion for such a distinction [Schultz, 1961, pp. 7-9]. Nevertheless, he gave his definition of human capital: "...Attributes of acquired population quality, which are valuable and can be augmented by appropriate investment, will be treated as human capital." [Schultz, 1982, p. 21]. Schultz defined a quantitative measure of human capital by capitalising income: "The value of such added human capital depends on the additional well-being that people derive from it." (Schultz, 1982, p. 23). However, it seems to us that measuring the value of human capital by capitalising income does not allow us to determine the efficiency (profitability) of human capital, since capitals generating the same income would appear equal in such a calculation and therefore not differentiated in their efficiency.

Another famous economist, Gary Becker, who studied the economic importance of welfare investment in parallel with Shultz, followed Shultz in his approach to human capital [Becker, 1964] and then extended this approach to all human behaviour outside the economy [Becker, 1976].

It is to the credit of these economists that they brought the problem of the quality of human resources to the attention of the scientific (and not only the) public. But their attempts to measure the impact of investment in human capital on economic development can hardly be accepted

as valid. Critics of the possibility of measuring the overall productivity of capital, notably Joan Robinson and Geoffrey Hodgson, have long demonstrated that this measurement is based on a logical vicious circle [Robinson, 1953; Hodgson, 2005].

Moreover, the correctness of equating investment in the development of human qualities with capital is questioned [Buzgalin, Kolganov, 2018, pp. 501-503]. What is this capital that cannot be bought or sold?

In our opinion, the concept of “human capital” is also untenable because (and this is one of the core ideas of the theory of Noonomy) it ignores an important fact: The development of one’s own qualities and self-fulfilment in creative work represent an independent human need that is impossible and not expected to be valued by the market. Moreover, the concept of “human capital” does not take into account the socio-institutional barriers that prevent a direct economic return on investment in human development [Anikin, 2017]. The main thesis of its proponents, namely the determinant influence of individual decisions on investment in education on workers’ income, seems questionable. In 1975, American Marxists put forward the thesis (not supported by empirical evidence at the time) that a worker’s income depends more on his position in the system of social relations than on his individual choice of investment direction [Bowles, Gintis, 1975, pp. 79-81]. Subsequently, this thesis was supported by a number of empirical studies which showed that income depends much more on the worker’s position in the hierarchical system of the firm than on the level of education [Baker, Gibbs and Holmstrom, 1993; Marginson, 2019; Wright, 1979].

Further arguments for this position arise from studies of the internal (within-firm) labour market [Doeringer and Piore, 1971] and studies of income distribution based on the concept of labour market segmentation [Dickens, Kevin, 1988; Piore, 1983].

The results of these and a number of other studies are summarised in the work of Blair Fix [Fix, 2019]. The researcher concluded that “The primary empirical justification for human capital theory has always been the income returns to education. Yet the available evidence suggests that education returns are dwarfed by returns to hierarchical rank. And returns to hierarchical rank are so large that they cannot plausibly be explained in terms of productivity.” [Fix, 2018, p. 29]. Taking a broader view of the problem, including from a Noonomy perspective, we would add to these indisputable conclusions: The evaluation of the “efficiency of human input”, its qualities (especially personal qualities) as “human capital” is only possible if we adhere to a strict “zoological approach” to the evaluation of the role of human beings in social production and their position in society.

So to explain the economic role of the creative worker through the concept of “human capital” is questionable to say the least. The key role of knowledge in modern production should not be understood by identifying acquired knowledge with capital. On the contrary, the organisation of the economy on the basis of the expansion of the possibilities of knowledge creates, to some extent, an alternative to the spontaneous movement of capital by transforming social relations in production from spontaneous to scientifically organised.

Knowledge economy and the role of the state

Human civilisation is an educated society, a society of knowledge. It is the process of learning about the world that has made man what he is. This is most evident in the modern technological environment that man has created based on the understanding of the laws of nature and the use

of acquired fundamental knowledge, especially technological knowledge, to transform a hostile world into a comfortable world that enables man's growing needs to be met.

But if mankind has invented and created the technological environment, then the social, including the economic, environment must also be shaped on the basis of reason and scientific knowledge. This is a necessary imperative for the development of civilisation as a result of the increasing impact of an ever-changing technological environment on society.

To date, economic science has had little success in normalising economic development. Economic crises, hunger, disease, social and economic inequalities, unemployment... Even in the prosperous European countries, many people are dissatisfied with their material and social situation. As far as the development of a scientific concept of the social system is concerned, the situation is no better. Throughout the history of civilisation, there have been many attempts to restructure society, but none has led to a harmonious, problem-free social organisation. In fact, the development of society is spontaneous and all we have to do is "follow" the process and interpret it in a more or less meaningful way.

It seems that this situation has not arisen by chance. The subject itself – society, its structure, the economy as the current form of satisfying the needs of its members, its intangible components (spiritual development, values, etc.), their interdependence, the non-linear relationship between its elements, etc. – is too complex to simply review and verify. – is too complex for a simple "verification by the algebra of harmony". We would like to emphasise – with the means available so far.

But progress is nevertheless being made. Scientific knowledge with the use of a new technological paradigm (with NBICS as the basis of its scientific paradigm), high technologies (including digital, artificial intelligence, etc.) that provide new, more grounded tools for the study and construction of social systems, on the one hand, enable the analysis of their functioning at a fundamentally more advanced level; on the other hand, they thereby undermine the basis of spontaneous economic and social development and force the state/institutions to "adapt" them in a more sophisticated way. Knowledge becomes the most important resource not only for industrial and technological [Bodrunov, 2018a], but also for social development.

One of the fundamental meanings of the concept of "Noonomy" is that scientific knowledge is beginning to play an important role in economic development, replacing spontaneous economic development with conscious and purposeful activities of people.

Today, global social development is facing many serious crises that cannot be solved on the basis of the liberal economic model and "spontaneous economic development" (as the liberals of the Austrian school say). However, some overseas economists, who have not recognised the essence of today's global problem of economic development in its totality and integrity, continue to insist that there is no alternative to spontaneous (chaotic) economic development. For example, Nobel Prize-winning economist F. Hayek [2011, p. 10] wrote: "The spontaneous cooperation of free men often creates things greater than their individual minds could ever fully comprehend".

However, the respected economist does not explain whether it is realistic to create an electric light bulb, a car, a computer or an aeroplane through "spontaneous" cooperation, let alone more complex things (such as the atomic bomb or the internet). All this and much more does not arise spontaneously from a spontaneous series of technological ideas or from the chaos of economic life based on ordinary market competition, but requires a deep understanding of technical pro-

cesses (the application of scientific knowledge) and conscious effort. Clearly, socio-economic development, its sustainable model, cannot be built “spontaneously”.

This creates a fundamentally different realm of understanding of social and economic processes in which the role and importance of the conventional market economy is minimised. It is in this realm of social understanding that the meaning and significance of Noonomy lies.

As has already been said, the understanding of the economy itself is changing in the current phase of development. The modern economy is not a spontaneous chaos of the actions of individuals; not only the market regulates many economic processes, but also the state. This is an objective and inevitable process. The state is being transformed by the latest production technology and the liberal state of the last century is disappearing. At the same time, there is no renaissance of market relations and private property, and the (monetary) form of the market is “gradually becoming emasculated and dying out.” [Bodrunov, 2018a, p. 197]. These processes lead to crisis phenomena in the economy, which are always accompanied by the transition to a new state. However, at this stage, when the power of technology has reached a threshold beyond which its unreasonable, “spontaneous” use means the death of civilisation, it is impossible to dispense with public control, which is implemented with the help of the only sufficient instrument in the form of the state. For this reason, the regulating and controlling role of the state increases in principle at this stage (we are talking about the principle, not the methods of its implementation, which can be controversial). Note that we are referring to precisely this phase of social development – the transition to NIS.2. The role of the state will change in the future, as we have already written.

Human civilisation is now more vulnerable than ever to threats from uncontrolled technological developments, from the destruction of the natural environment (e.g. climate change), from human interference with nature (e.g. modern pandemics), from the uneven development of countries and from social conflicts. The conclusion is that humanity has reached the limit of efficiency of the existing development model [Bodrunov, 2018a, p. 56]. This thesis can be found in many authors.

For example, Cambridge University professor E. Gamble in the book with the significant title: “Crisis without End? The Collapse of Western Prosperity” writes: “An end to the profound crisis of the neoliberal order, of which the 2008 collapse was the shining sign, is not yet in sight.” [Gamble, 2018, p. 15]. And if this is true (which is increasingly difficult to deny), then there is a dilemma: what awaits humanity in the future: a dead end or a path to “rational man and society”? Humanity is faced with a choice: to end its civilisation in disgrace or to evolve into a rational human being and a rational society that is not “business as usual” but based on scientific knowledge.

It must be remembered that knowledge is a special product of human activity. It is by nature, unlike the usual material product, indestructible in the process of consumption; it can even “multiply” (in the utilitarian sense) in the process of consumption when the user refines and completes something, i.e. enriches the resulting “quantum” of knowledge with new elements. The conclusion is that knowledge, even if it functions as an economic product, cannot be an ordinary product in the traditional sense, i.e. a market product. An ordinary commodity is lost in the process of consumption, whereas knowledge always stays with a person (if he or she is not too “forgetful”). Thus, the knowledge-intensive production into which man enters with the transition to a new technological order at the stage NIS.2 [Bodrunov, 2018a, p. 94] – the new industrial society of the second generation (counting D.K. Galbraith’s era of the new industrial society as the first

generation) – is no longer the usual market economy of the penultimate and even the last centuries. Therefore, the usual market-based economic regulators are also a thing of the past. This phase is characterised by the “economisation” of the state as a special institution for regulating economic transition processes.

Most relations between people involved in the production (and consumption) of things and services are not regulated by the market but by the state – and increasingly so. Food, housing, medicine, transport and many other things that provide for people’s livelihoods are under the direct control of the state. A good current example is the gas supply in many European countries. It is no longer so much the ordinary people and the private sector who are worried about this, but the government, i.e. the state.

The state, and especially the government, is not so much concerned with maximising profits as it is with maximising public benefits, i.e. the ‘needs of an organised society’. Of course, market exchange remains, but the goal of state regulation of social production is already different. The economy itself is changing from a sphere in which the individual producer seeks to maximise profit to a sphere in which the state seeks to maximise social utility. In this new economy, tendencies that objectively counteract the expansion of financialisation and simulativity (e.g. the sharing economy, the spread of the institution of property, etc.) are gaining strength. And these processes, which continue and spread over time, are gradually making the traditional economic space disappear and paving the way for a space of non-simulative and solidary consumption based on people’s non-potential needs. In this process, the role of the state as a social institution that integrates the economic, social and regulatory aspects of society and ensures its safe and rational functioning is unique.

Undoubtedly, the most important function of the state as a social institution in the stage of NIS.2 is to strengthen the socialisation of society, to form and specifically strengthen institutions aimed at expanding the space of noo-values, gradually transforming people, motivating their activities according to the criteria of reason, with a noo-criteria basis of the new social order. Of course, the state itself will also be transformed as part of this process, gradually changing from an institution of coercion into an institution of coordination of public interests and human development, to the point of completely changing its nature during the transition to Noonomy. In this sense, the traditional, “old” state, having changed its functions, will become obsolete and give way to a new institution for the management of social development.

In the transition of many economically developed countries to a “knowledge society”, certain areas of human activity (science, education, culture) are gradually falling outside the sphere of market regulation. The conclusion that market mechanisms are weakening and no longer functioning in these areas of creative labour has been developed in the new socio-economic science for many years. The economy is not reduced to the market, but extends to a large area of human activity where the old economic principle of balancing costs and outcomes seems to continue to play an important role. But in the new economy, the situation changes fundamentally. Finally, inputs and outputs can be expressed not only in terms of money, but also in terms of time saved, effort expended, more pleasure and prosperity, which means an increase in social utility. Here is a famous statement by K. Marx: “...all economy is ultimately reduced to the economy of time” [Marx, 1968, p. 117]. And this is true, because the most important value for man and society is time. Not profit, but time – this is the central meaning of the new economy of NIS.2, which in Noonomy passes into the “absolute”.

Role of knowledge and culture

In the industrial age, man was regarded as an appendage of machine production, who had to have the right qualifications and skills. This was justified in the era of the emergence of industrial mass production and the supply of mass material goods to society.

But human beings themselves should not and cannot be reduced to mere commercial profit; human beings and being human are much more than a profit motive. The human being cannot be considered as an element of the market mechanism. Consequently, vocational education and training cannot be understood as a market process for profit either. Culture, on the other hand, has never been considered a market economy (apart from fairs). As one contemporary researcher writes, “competitive relations in the sense of the market are impossible in the field of culture”. (Muzychuk, 2017, p. 24). Indeed, for example, the Bolshoi Theatre competes with the Maly Theatre for the sympathy of the audience, but there is no competition in the sense of the market between the two, because the Bolshoi will not absorb the Maly Theatre and become a monopolist.

However, with the transformation of the state into an economic actor came the temptation to view all areas of society as elements of the market process. The educational process was increasingly interpreted as a “market for educational services” and the “production of knowledge” as the production of commodities. Thus, in the early 1960s, the famous American economist F. Mahlup wrote: “Knowledge production is a field of economic activity; we may even call it an industry”, approaching this issue. (Mahlup, 1966, p. 37).

Under market conditions, economic activity is directed only towards making profits and does not involve anything else. The production of knowledge and its transmission (education) served the purpose of making profits only in the first phases of industrial development, and that only partially and “occasionally”. It is worth recalling that the first universities that emerged in Europe in the twelfth century were not primarily profit-oriented.

Perhaps even today few would dare to think of the classical university as a purely commercial enterprise, like a beer factory. It seems that it borders on absurdity to consider “knowledge production” exclusively as an industry.

As already mentioned, knowledge cannot be an “ordinary” commodity, it is not bought but received; it is not sold but passed on or disseminated. In the most categorical form, this was formulated by the academic V.L. Makarov RAS [2003, p. 454], who stated that “knowledge, like other public goods, when created, is available to all without exception”.

Of course, there are institutions that artificially restrict the use of certain “quanta” of knowledge for market purposes: patent consolidation, intellectual property institutions, etc. It is possible, for example, to organise paid sewing courses, and outwardly (in form) this would look like a paid market service, like a hairdresser. But the form must not be confused with the content. The participant in these courses does not pay for the knowledge, but for the work of the trainer. If a hairdresser leaves a hairdressing salon groomed or cut in any case, depending on the amount of money paid and not on his own efforts, the participant leaves a training course, even a “highly paid” one, enriched with knowledge and directly dependent on his own efforts. Some leave without any knowledge at all, even though they have paid the prescribed amount of money. And even received a diploma.

Theoretically, education cannot be treated as a service. The university is not a barber shop. It is a special social-humanitarian sphere of social development. But, as mentioned earlier, when the modern state becomes the main economic actor, culture and education, which have

always been under the tutelage of the state, become special spheres of the economy. At the same time, the economy itself takes on a new quality. Muzychuk explains: “The necessity of separating culture, science and education into a separate humanitarian sector of the economy arises from common “generic” characteristics that do not allow these sectors to function under market mechanisms without the paternalistic guardianship of the state. The high level of social benefit is at odds with the efficiency of the business models by which their activities are evaluated.” [Muzychuk, 2017, p. 6]. Thus, when culture and education, which are not market phenomena, are considered part of the economic system, the latter also loses many market features.

The basis for all this is the new role of the state.

(The ending follows)

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