

SECTION 12.

SOCIOLOGY AND STATISTICS

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ARTIFICIAL INTELLIGENCE AS A TOOL OF COGNITIVE DYNAMICS IN KNOWLEDGE SOCIETIES

Plato asserted: "there is nothing stronger than knowledge" [1, p. 470]. As for knowledge, here Plato, having designated knowledge as food for the soul, pointed out the risks of turning knowledge into a commodity, and when sellers "carry knowledge throughout the cities and sell it wholesale and retail to all comers, although they praise everything they sell, but perhaps ..., some of them do not really know whether what they sell is good or bad for the soul; and those who buy from them do not know either. ... So, if you know what is useful here and what is not, then it is not dangerous for you to acquire knowledge ...; if not, then be careful ..., lest you lose what is most dear to you. After all, there is much more risk in acquiring knowledge than in buying food. "Food and drink... you can carry away in vessels, and before taking them into your body in the form of food and drink, you can store them at home and consult with a knowledgeable person about what you should eat or drink and what you should not, as well as how much and at what time. With such a purchase, the risk is not great. Knowledge, however, cannot be carried away in a vessel, but willy-nilly, having paid the price, you will have to take it into your own soul and, having learned something, leave either with damage to yourself or with benefit" [1, p. 423]. In addition, the differences between knowledge, opinion and ignorance are important, where "opinion is neither knowledge nor ignorance ... more vague than knowledge, but clearer than ignorance ... something in between" [2, p. 260].

The Book of Changes (Hexagram No. 7 Shi. Army) teaches: "There can be no new knowledge in cognition when the act of new cognition lacks inner strength and correctness. It is unable to overcome the inertia of already accumulated experience, which, under new conditions, may be completely inapplicable, not living. New, living knowledge is replaced by the corpses of previously existing thoughts, alien to the current moment of cognitive life. In other words, the death of knowledge,

misfortune, a schism between knowledge and the world occurs" [3].

Aristotle agrees that "all people by nature strive for knowledge" [4, p. 65]. But he considered knowledge (*epistēmē*) together with reason (*phronēsis*) and skill (*technē*), where knowledge is related to what is "knowable through proof and reasoning," reason – to things connected with activity, choice and avoidance, "when to do something or not to do it depends on us," and skill – to deeds and created things [5, p. 333]. However, he also claimed that those "who possess abstract knowledge (*logon echein*), but lack experience, ... often make mistakes in treatment, for they have to treat something individual", although "they know more than artisans and are wiser than them", and at the same time "artisans are like some inanimate objects: although they do this or that, they do it without knowing it" [4, p. 65]. It's like a paradox: the wise "often make mistakes", and the artisan is likened to a "biorobot". Everything is in the style of F. Bacon's "idols of the spirit": "The idols with which the spirit is possessed are either acquired or innate. Those that are acquired have entered into the minds of people either from the opinions and teachings of philosophers, or from the perverse laws of evidence. Innate ones are inherent in the nature of the mind itself, which turns out to be much more prone to errors than the senses" [6, p. 77].

According to P. Drucker, "an experienced leader, before making a final decision, organizes a debate, an exchange of opinions" [7, p. 79]. And P. Bourdieu spoke of the practice of "doxosophists" (*doxa* – opinion) as a "science without a scientist," a "science" of questionnaires asking their respondents questions that the political microcosm itself asks about them [8, p. 121]. That is, the imaginary (to *doxaston*) strives to reduce knowledge to the level of opinion.

Modern civilization recognizes the urgency of rethinking the role of knowledge in its development, as indicated by the UNESCO World Report "Towards Knowledge Societies" (2005) [9], which states that knowledge has become a subject of colossal economic, political, and cultural interests to such an extent that it can determine the qualitative state of society, the contours of which are only beginning to emerge, fueled by the growing number of studies on the new status of knowledge and an increasingly clear understanding of its role in development initiatives. However, the World Report also acknowledges that knowledge itself is only the path to wisdom, and that in knowledge societies, each person will need to be able to freely navigate the flood of information that overwhelms us and develop cognitive abilities and a critical mind to distinguish "useful" from "useless" information. At the same time, it acknowledges that knowledge alone is not a panacea for risks. Thus, there is a risk of the emergence of global specialization, which would lead to the division of the world into two cognitive "civilizations" (one based on knowledge production

and the other based on its consumption or practical implementation). Also mentioned is the lack of vigilance, unawareness, and even irrationality that knowledge societies themselves create, in the form of major man-made disasters, etc. And with the advent of the first computers, a cybernetic fantasy of intelligently governing societies emerged. The World Report also mentions a skills crisis, as well as the risk of fragmented knowledge, which specialization inevitably entails, requiring multidisciplinary or interdisciplinary approaches capable of mitigating these risks.

The UNESCO World Report "Towards Knowledge Societies" points out that the cognitive dynamics of our societies has become a critical challenge. L. Festinger, analyzing the causes of cognitive dissonance, i.e., contradictory relationships between individual elements in a knowledge system, pointed to the need to "search for a universal measure that could reflect the overall degree of emerging dissonance" [10, p. 18, 81]. E. Toffler believes that we need ever newer types of specialized knowledge, an increasing number of "multispecialists" (people who possess deep knowledge in one field but can also work in another), rather than ossified "monospecialists" [11, p. 313]. Here it is appropriate to recall the well-known formula of T.H. Huxley: "Try to learn a little about everything and everything about a little."

Naturally, the cognitive dynamics of an individual is a process that begins at the moment of birth and continues throughout life with a certain specificity of life stages, as established by Confucius, and, in addition, he pointed out that "Those who have innate knowledge stand above all. They are followed by those who acquire knowledge through learning. Next come those who begin learning after encountering difficulties. Those who, having encountered difficulties, do not learn, stand below all" [12, pp. 143, 170]. A. Maslow's fundamental pyramid of needs goes from physiological needs to the level of self-actualization with its cognitive component [13]. The practical side of the issue should be consistent with the modern National Qualifications Framework, based on the conceptual and methodological knowledge, as well as on mono-disciplinary and multi-disciplinary approaches [14]. The diagram of cognitive dynamics and harmony of specialization and universalization based on inter- and multi-disciplinarity of sciences is presented below in Fig. 1.

K. Matsuura, appealing to the essence of the knowledge society, admitted that "while the importance of this concept is no longer in doubt, the situation regarding its substantive aspect is far from brilliant. What kind of knowledge (or knowledge) are we really talking about? Should we accept the hegemony of the scientific and technological model in defining legitimate and productive knowledge? And what

should be done about the imbalance observed in the area of access to knowledge and the obstacles that arise along this path, both nationally and globally?" Illuminating the panorama of the future, K. Matsuura admitted that it appears both promising and troubling. Promising – because the potential contained in the wise and skillful use of the latest technologies opens up truly broad prospects for sustainable human development, etc. Troubling – because there are indeed very real obstacles and pitfalls along this path (for example, the digital divide, the cognitive gap between the most prosperous and developing countries, etc.). Therefore, he recommended “exploring new paths that will lead us to a common horizon, allowing each person to move at his own speed and using his own methodology” [9].

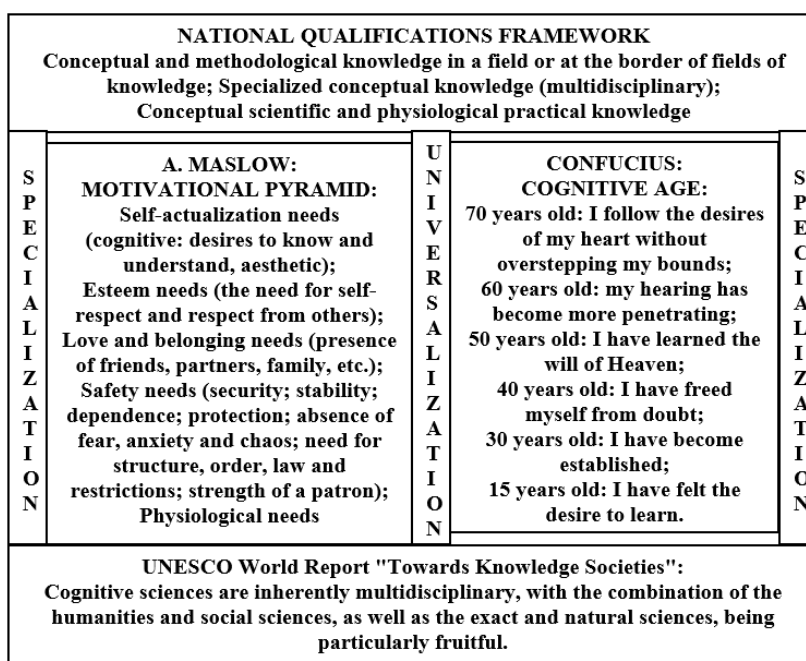


Fig. 1. Diagram of cognitive overcoming of the disharmony of specialization and universalization based on the multidisciplinary of sciences

Note: compiled by the author based on [7-14]

Thus, “knowledge in itself is only the road to wisdom” [9]. J. A. Komensky in his “Great Didactics” explains the reason for the necessity of adding analysis to synthesis: “An analysis of other people’s inventions and works must be added to synthesis. After all, he who has traveled it in both directions and who has noticed all the crossroads, intersections and side paths encountered along it knows a road well. Moreover, things are so varied and, to a certain extent, infinite that this diversity does not fit into any rules and cannot be foreseen by one person. More heads are given more. But the fruits of another’s work become ours only after careful research and study and when then, through competition and imitation, we acquire

the habit of reproducing similar ones” [15, p. 315].

It should be noted right away that the UNESCO World Report “Towards Knowledge Societies” mentions the issues of analysis 45 times, and the issues of synthesis – once (the synthesis of all those diverse approaches that include... “information society”, “knowledge-based economy”, “learning society”, “risk society” or “learning for all and throughout life”).

This is precisely what G. Mintzberg wrote about: “Management has accumulated a considerable amount of knowledge, but by no means in a form convenient for those engaged in the creation of organizational structures. ... There are two reasons for this. First, it consists mainly of articles and books written in an academic style, aimed primarily at scientists. Trying to understand their terminology, a practitioner discovers that for the most part these works speak about what is, and not about how it should be; in other words, they analyze the existing state of affairs, and not the principles of building an effective organization. Secondly, despite the vastness of the literature devoted to this topic and the many points of view presented, it lacks synthesis. No other sources will give the practitioner such a deep understanding of the problem; but he will have to “process” hundreds of volumes to grasp what, in fact, is at stake. And even then, the reader himself will have to engage in synthesis. The researchers' conclusions are contradictory, and almost no attempts are made to reconcile the positions. Therefore, even if you have the patience to study all these works, you will become even more confused” [16, p. 12].

In this regard, A. Maslow emphasized: “If we want facts to tell us what they mean, we must learn to listen to them in a very specific way, which can be called Taoist - to listen silently, hidden, completely immersed in listening, without interfering, receptive, patient, respectful and reverent” [17, p. 137]. But although Lao Tzu recognized that it is impossible to govern a country without resorting to wisdom, he also pointed out that war is waged by cunning [12, pp. 117, 131]. Sun Tzu also recognized this: “War is a great matter for a state, it is the root of life and death, it is the way of existence and ruin. ... it is the way of deception. Therefore, if you can do something, show your enemy that you cannot; if you use something, show him that you do not use it; even if you are close, show him that you are far away; Even though you are far away, show that you are near; etc. ” [12, p. 200-202]. Here it would be appropriate to recall the words of Confucius: “Ning the Warlike behaved wisely when there was a way in the land, and foolishly when there was no way. One can compare with him in intelligence, but not in foolishness” [18, p. 39]. Ecclesiastes also spoke similarly in this regard: “while my heart was led by wisdom, I also clung to folly, until I saw what was good for the sons of men, what they should

do under heaven during the few days of their life. [Eccl. 2: 3].

Consequently, the cognitive support of a subject constructing his or her professional and life path must be based on the fundamental principles of orientation in the continuum of “knowledge-opinion-ignorance” set out in the Book of Changes [3], taking into account the application of Sun Tzu’s dichotomies (“knowledge-ignorance”, “external-internal”, “possible-impossible”, etc.), which predetermine the success and failure of actions [12, p. 205].

The diagram of cognitive support for a subject who strives to harmonize the search for and overcoming of the path destined for him or her is presented below in Fig. 2.

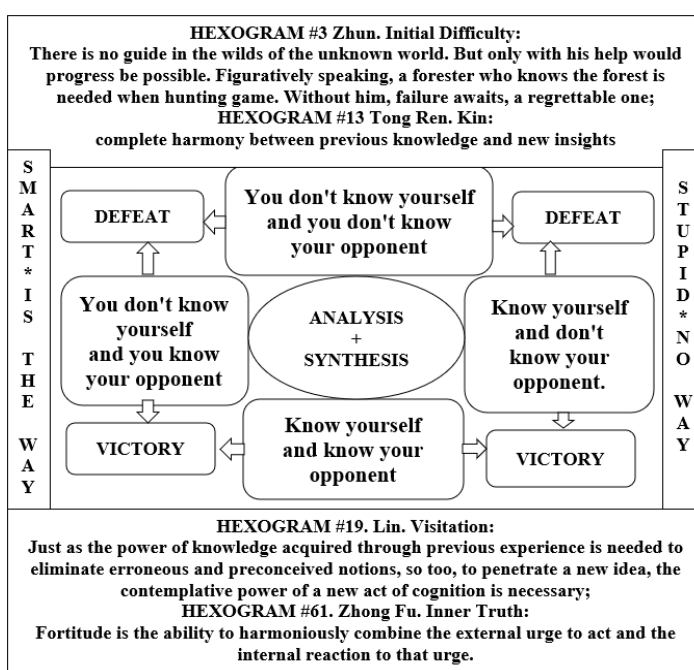


Fig. 2. Schematic diagram of cognitive support for a subject who strives to harmonize the search for and overcoming of their intended path

Note: compiled by the author based on [3, 12, 15, 16, 18]

Thus, the dominance of specialization and analysis over universalization and synthesis has led to the increasing fragmentation of knowledge. An individual cannot cope with such a mass of fragments; the computer has emerged, which, as B. Gates pointed out, is so far "no more than an instrument of the human intellect" [19, p. 293]. Today's man, as M. Heidegger asserted, "saves himself by flight from thinking," and moreover, by flight from meaningful thinking to calculating thinking. If meaningful thinking is not decisively opposed to calculation, then there is a risk that "calculating thinking will one day remain the only valid and practiced mode of thinking" [20, pp. 103-110].

E. de Soto acknowledged that "we live in a legislative labyrinth in which even Daedalus would have perished" [21, p. 8]. F. Saussure recognized the risks of wandering in the linguistic labyrinth [22, p. 242]. According to H. Dreyfus, resolving such a conflict requires reconciling labyrinthine and heuristic problems [23, p. 329].

According to G. Simon, "in the field of public administration... we still do not have adequate linguistic and conceptual means for a realistic and adequate description of even the simplest administrative organization—that is, a description that allows for a scientific analysis of the effectiveness of its structure and functioning. ... Therefore, "the descriptions of administrative organizations created today are characterized by excessive multi-layeredness, simplified form, and insufficient realism. [24, pp. XI, 45].

According to N. Wiener, the value of a computing machine is identical to the value of the person using it; it can enable them to advance further in the same amount of time. But they must have ideas [25]. And if we consider Papus's theses regarding the formation of ideas through a combination of words and numbers (Ideas expressed in numbers and letters are undeniable realities) [26, p. 70], then it is quite logical to assume that the constructive development of artificial intelligence in a knowledge society can be guided by the following diagram.

The diagram for the harmonization of intelligences in the "comprehension-computation" coordinates through words, numbers, and ideas is presented below in Fig. 3.

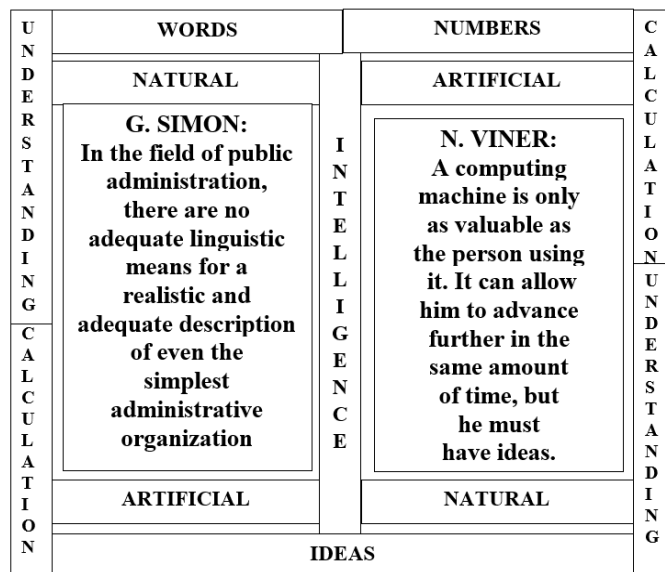


Fig. 3. Diagram of the harmonization of intellects in the coordinates "comprehension-calculation" through words, numbers, and ideas

Note: compiled by the author based on [20, 24-26]

Conclusions:

* Since ancient times, the role of knowledge in the development of man and society has been universally recognized; however, the transformation of knowledge into a valuable commodity has entailed the risk of being unable to assess its potential benefits and harms;

* In real practice, all knowledge coexists alongside reason and skill; however, all representatives of this triad are subject to errors and hierarchical perceptions of inferiors as inanimate objects;

* Modern civilization declares the emergence of a knowledge society, but simultaneously recognizes the risks of such development, which are associated with a crisis in personnel qualifications, fragmentation of knowledge, specialization, etc.;

* The pursuit of cognitive dynamics between the individual and society presupposes a harmonious balance of specialization and universalization based on inter- and multi-disciplinarity and consideration of the pyramid of needs and cognitive age;

* The movement of knowledge societies toward a common horizon should be based on the ability of each participant to plan and implement their own development independently, using coordinated methods of analysis and synthesis;

* Cognitive support for a subject striving to find and overcome their chosen path must be based on a focus on "knowledge-opinion-ignorance," "external-internal," "possible-impossible," etc.;

* The dominance of specialization and analysis over universalization and synthesis has led to the increasing fragmentation of knowledge, and consequently, the emergence of the computer as a tool of human intelligence;

* The way out of civilizational labyrinths presupposes the creation of forms of artificial intelligence that harmonize conceptual and computational thinking through ideas expressed in numbers and letters.

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