CUESTIONES POLÍTICAS

Instituto de Estudios Políticos y Derecho Público "Dr. Humberto J. La Roche"
de la Facultad de Ciencias Jurídicas y Políticas de la Universidad del Zulia
Maracaibo, Venezuela

Vol.41 | Nº 79
Octubre
Diciembre
2023

The impact of metacognitive changes of digitalized consciousness on public administration policy

Maksym Lepskyi *
Igor Kudinov **
Natalia Lepska ***
Alexander Rusetsky ****

Abstract

Using the method of observation and analysis of official documents, the article explores the influence of the digital creative class on traditional state institutions, which ultimately leads to metacognitive changes in the digitized consciousness of society. Currently, state institutions face challenges in the digital age, such as the «information bubble,» irrational and emotional user choices, and competition for attention based on impressions, «likes,» and diverse opinions. Artificial intelligence technologies have influenced various industries and public administration, causing a shift from traditional interaction to virtual formats with state institutions. An example of this transformation is the Ukrainian online service DIIA, which offers document circulation, access to open records, identification and identity confirmation, and data tracking and analysis systems. It is concluded that, the interaction between public administration and digitization processes falls into four main categories: as a prototype of complement, reinforcement of the «exoskeleton», connection and blending of solutions in human-AI interaction, and delegation or replacement of human decision-making by AI.

Keywords: actor; information retrieval worldview; digitization; public decision making; metacognition.

* Doctor of Philosophy, Academician of the Ukrainian Academy of Sciences, Professor of Sociology Department, Zaporizhzhia National University Zaporizhzhia, Ukraine. ORCID ID: https://orcid.org/0000-0001-5604-641X. Email: waysensey@gmail.com

** PhD., Associate Professor of Sociology Department Zaporizhzhia National University Zaporizhzhia, Ukraine. ORCID ID: https://orcid.org/0000-0001-7785-1637. Email: info@igorkudinov.pro

*** PhD., Associate Professor of Political Science Department Zaporizhzhia National University, Zaporizhzhia, Ukraine. ORCID ID: https://orcid.org/0000-0001-6010-423X. Email: lepskanv@gmail.com

**** PhD., Director of Laboratory of Geopolitical Modeling Caucasus International University, Tbilisi, Georgia. alex_scirs@yahoo.com https://orcid.org/0000-0003-2646-1625

El impacto de los cambios metacognitivos de la conciencia digitalizada en la política de la administración pública

Resumen

Mediante el método de observación y análisis de documéntalos oficiales, el artículo explora la influencia de la clase creativa digital en las instituciones estatales tradicionales, lo que, en última instancia, conduce a cambios metacognitivos en la conciencia digitalizada de la sociedad. En la actualidad, las instituciones estatales se enfrentan a retos en la era digital, como la «burbuja de la información», las elecciones irracionales y emocionales de los usuarios y la competencia por la atención basada en impresiones, «me gusta» y opiniones diversas. Las tecnologías de inteligencia artificial han influido en varias industrias y en la administración pública, provocando un cambio de la interacción tradicional a formatos virtuales con las instituciones estatales. Un ejemplo de esta transformación es el servicio en línea ucraniano DIIA, que ofrece circulación de documentos, acceso a registros abiertos, identificación y confirmación de identidad, y sistemas de seguimiento y análisis de datos. Se concluye que, la interacción entre la administración pública y los procesos de digitalización se clasifica en cuatro categorías principales: como prototipo de complemento, refuerzo del «exoesqueleto», conexión y mezcla de soluciones en la interacción entre humanos e IA, y delegación o sustitución de la toma de decisiones humanas por la IA.

Palabras clave: actor; cosmovisión de recuperación de información; digitalización; toma de decisiones públicas; metacognición.

Introduction

Modern events such as COVID 2019 and the Russian-Ukrainian war with full-scale Russian aggression from February 24, 2022 have led to important changes in the development of digital technologies and their application during global threats to society and the activities of its main central institution – state.

In our opinion, the most significant changes that influence on public administration are in:

- the division of labor related to the formation of the Internet space, and therefore challenges to public administration regarding the use of digital professions in it and digitization of workplaces;

– the transition of public administration to the provision of public services in a digital format using innovative information and communication technologies (ICT), and the possibility of creating digital safeguards against corruption (the creation of front and back offices in public administration, the possibility of journalistic, civil and criminal investigations using the global Internet memory (for example, Wayback Machine (2023) and others);

– the replacement of some functions and even positions through artificial intelligence;

– the development of a creative class that has sources of financing and conducting business from digital technologies, which in the interaction of "politics-state-business-civil society" will influence the state through politics, civil society, business on public administration (the main process in the institution of the state);

– the waging informational and hybrid wars with informational and psychological special operations (IPSO) of various conflict actors or even wars between states, where state institutions remain the main regulator and actor of conflict resolution.

Therefore, the purpose of the article is to discover how exactly current trends affect the formation of metacognitive changes of digitalized consciousness on public administration policy.

The study of the impact of metacognitive changes of digitalized consciousness on public administration policy determines the solution of such tasks:

1. Determination of the process of formation of consciousness and the impact of significant changes, which determines and forms a new contour of worldview, in our case, digital or information-retrieval consciousness. First of all, the most important task in this process is to determine the role of digital consciousness, which develops on the basis of previous historical types of consciousness that consistently emerged, dominated for a certain time, and then moved from a central role to a peripheral one, but did not disappear. So, we are talking about the mythological, religious, philosophical, scientific, and modern digitalized worldview.

2. Determination of metacognitive changes in digitalized consciousness, which is considered from the understanding of the metacognitive level of consciousness of people, in our study – civil servants and local officials. The center of assembling the solution to this task is the understanding of metacognitive processes, metacognition. Within the framework of the theoretical conceptualization, metacognitive competences, metacognitions in the effectiveness of cognitive

processes, metacognitive processes, generalizations, judgments of strategies that have a higher structure, general and integrative character in relation to cognitive processes are considered.

3. The third task is the study of how digital metacognitive thinking affects and can affect the public sphere and the process of public administration in the future.

1. Methodology of the study

The study is based on observation and analyzing of official documentation, current legislation, official websites of public authorities and producers of specialized software, especially those web resources that directly focus consumers' attention on the possibilities of using their products as a tool for management processes automation. The study includes analysis of public policy reality, the sphere of public administration, and the activities of the management process actors (subjects), analysis of existing (documented) examples of innovative information technologies implementation in public administration.

The empirical basis for the analysis consisted of materials from the media, examples of successful application of various information technologies for automating the provision of public services, materials from international non-governmental organizations, and so on.

The team of the authors of the article has been involved in the international research project since 2023 – "Metacognitive theory of political crisis management and the Laswell-Flywell metacognitive scientific monitoring system of political behaviors", which is supported by the Caucasus International University. The study of the impact of metacognitive changes of digitalized consciousness on public administration policy is based on the basic theoretical propositions that form the methodological foundation of our research. Firstly, we consider historical types of consciousness that consistently arise, at some stages are advanced and dominant, but at the next stage of development do not disappear but exist on the principles of co-evolution and mutual complementation. We define such historical types of worldviews as mythological, religious, philosophical, and scientific. And now a digitalized, information-retrieval worldview is being formed, which has its own specifics.

Concerning the worldview, the article is based on theoretical points of M. Lepskyi (Lepskyi, 2022), namely on such structural elements as: worldview type, institutional medium that forms the environment, system of meanings (event, meaning actor, actor of practices and meaning, plot unit, element), sphere of aggression (socially acceptable aggression, socially unacceptable aggression).

The comparative analysis is based on the following components:

1. A system of meanings is an event and a plot element, as something that reflects qualitative changes in the objective world and, accordingly, people's ideas about them; since in the social world events always have their pioneers and innovators (the first one creates something new important for this worldview, the second implements it into social practice). Therefore, we consider actors (subjects) of meaning (pioneers) and actors (subjects) of practices and meanings (innovators who embody innovations in practice).

2. Sphere of aggression (as what determines the activity of transforming the world). Here we are supporters of Erich Fromm's point of view about constructive and destructive aggression, which at the level of society is reflected as socially accepted aggression (and sometimes approved) and socially unacceptable aggression (which is precisely not acceptable in society). These criteria for comparing historical types of worldviews are especially important in the study of conflicts, wars, and global catastrophes. The lack of activity, determination, and capacity for action as an energetic attitude towards the world leads to the removal of subjectivity and the transition to the state of a victim, that does not change the worldview, but only determines adaptation and inaction.

3. Institutional large-scale medium that forms the environment. In this component we state that pioneers and innovators constitute the form and effectiveness of their activity and behavior, its worldview meanings in social institutions which are reproduce and transmit worldview and practical activity through social institutions that are created, developed, and consolidated at a new historical stage marked by a type of worldview.

2. Analysis of recent research

The worldview level of analysis requires theoretical analysis of meta-level. Therefore, the study of metacognitive processes of changes in the formation and development of digital consciousness in public administration policy are an important process.

American researcher J. Flavell introduced the concept of "metacognition" into scientific circulation, as he tried to experimentally prove the cognitive processes of purposeful and planned thinking of the second order (according to J. Piaget), which has a reflexive nature of observing and managing one's thinking. This content is manifested in formal operations in regulatory actions of cognitive activity and knowledge, which are united by its concept (Hacker, 1998).

Similar definitions of metacognition as control of one's own thinking and its specifics in relation to educational activity (Cross & Paris, 1988); with an emphasis on self-reflective knowledge in the process of controlling one's cognitive processes (Metcalfe, 2009); but the main features of this process are knowledge about one's own thinking, the ability to observe, implement and adjust cognitive activities based on them, etc. It is regulatory actions, self-observation of thinking, and control over cognitive activity that are attributed to the attributive characteristics of metacognition. M. Martinez defines thinking as the center, core, observation (monitoring) and its control (more precisely, self-control) (Martinez, 2006), K. Lyons and P. Zelazo consider such a characteristic as awareness and the process of managing one's own thinking (Lyons & Zelazo, 2011), but in general it continues the tradition of J. Piaget about cognitive processes of a higher order, which is indicated in the concept by the prefix "goal".

Today, metacognition is studied in various theoretical concepts: models of cognitive monitoring by J. Flavell, a process-oriented model of metacognition by J. Borkovsky, hierarchical model of metacognitive monitoring of knowledge by S. Tobias and H. Everson, two-level model of metacognitive regulation by T. Nelson and L. Narens.

Digitization in the field of public administration refers to the process of converting analog processes, products, and services of the state into a digital format using the latest (cutting-edge) information technologies. The essence of digitization is the process of replacing traditional methods of data storage, processing, and transmission with digital ones, which allows to increase their efficiency and availability, reduce costs, and shorten the time for performance of work. It is associated with the growth of the use of computers, networks, and other electronic devices in various spheres of life, which leads to an increase in the amount of information (data).

It was the gradual accumulation and rapid growth of the amount of data that became the impetus for the development of a new paradigm in information science, which is associated with the appearance of the term "Big Data". The term denotes significant (large) information assets in terms of volume, speed and/or variety (Suthaharan, 2016), which cannot be effectively stored or processed by traditional methods, and therefore require the use of innovative information processing methods. The opposite direction is the formation of micro-targeted and individualized technologies for the formation of "information bubbles" around the user, i.e., in the fight for people's attention, people get corresponding news and messages.

3. Results and discussion

3.1. Essence of information-retrieval worldview

Let's examine the essential attributions and elements of the worldview first. Then move to the metadynamics of worldviews and the impact of the main trends of digital processes on public administration policy.

Free thinking and the search for rational foundations of knowledge and wisdom have always been associated with the philosophical and the scientific worldview that grew out of it. The philosophical worldview was formed both in the polis and in the religious medium – the monarchical state. It became the dominant worldview in the Renaissance, forming the project of Modern times, the project of science.

The main ideas of the kingdom of reason and wisdom were determined by the ideals of wisdom, truth, justice, human and state centrism. These ideas made their way for a long time. The main collection of ideas occurs in the defense of the role of a citizen and a city resident, since the relations of the civil community required rational argumentation, evidence from practice and the results of the search for laws and patterns.

Philosophers and scientists who carried out theoretical and practical activities became the main actors (subjects) of understanding. At the same time, the users of knowledge became engineers, statesmen and entrepreneurs: those who created prototypes and models, production, and commercialization systems. The national state, rejecting the sacralization of power, searched for unity in the division and balance of power. Rationally based models became units of meaning.

The main events determining the dynamics of meanings were the discoveries made by a scientific innovator. A whole ideological and contextual series of prototypes of innovators in the economy, politics, culture, technology, military affairs, etc. appeared in the division of power and spheres of life activity of the state.

It was the nation-states that became the main engines of the industrial and mass-media society with the transition from print (newspapers, outdoor advertising) to radio, television, that is, to technical means of mass information. Industrial methodology of rationalization of cognitive processes, connected, first of all, with systemic, structural and functional, synergistic models of public administration. The models had the character of public engineering of public administration as the engineering of bureaucratic algorithms, principles, regulations, orders, external legal norms, internal by-laws, record keeping formats, etc.

In addition to rationalization in the digitized process, the software forms an assembly for users in public administration, therefore, the formatting of the software has metacognitive properties precisely in the developers of this software. The modern transition through digitization from mass media to referential contact-mass communication in social networks involves the digitization of the main carriers of meanings and images.

In this format and software civil servants depend on the format of metacognitive processes of developers. Emotions determined the communicative basis of a new worldview, in which previous types of worldviews also found a place, and at the same time, its own specificity was formed. Superstate formations in the form of social networks, search engines, data banks, such as Wikipedia, etc., became the medium of this worldview.

If earlier it was assumed that it would be an information-cognitive worldview, than now, based on the essential specifics, it is rather an information-retrieval worldview that forms its meanings and practices, as, in fact, the division of labor with the predominance of the process of searching for information and content is formed in the direction of this search.

This worldview is based on the society of consumption and hyperreality, but it is not reduced to it, which was ingeniously predicted and analyzed by J. Baudrillard. Digitized meanings make up a huge Internet memory – that's why all this requires from the consumer (user) constant sliding, surfing, informational and territorial localization in social groups and communities.

The basis of the information-retrieval worldview is not knowledge, but information (in-form), novelty, emotions, and impressions of the flow of information, often without knowledge. Information-retrieval news thinking is dominated by affects and emotions. Attempts to rationalize them in the concept of emotional intelligence are not very successful in the practice of newsfeeds and streams.

There is a rollback in the augmented and virtualized digital environment to the neo-mythic, to what Umberto Eco labeled as neo-feudalization, in the images of the early Middle Ages with localization and fragmentation, with neo-priests-experts and elders.

The actors (subjects) of understanding the information-retrieval worldview are media workers (including actors of social networks – bloggers, experts, Instagrammers, site and company ambassadors, etc.) and those who use content, who are contextual and thematic strategists, advertisers, marketers, targeting and SMM specialists, whom we indicate as information and network technologies, emphasizing their goal-oriented, algorithmic, replicated and artificial characteristics of activity.

Therefore, for example, the relevant ministry in Ukraine (Ministry of Digital Transformation) was headed by the founder of IT company "SMM studio" Mykhailo Fedorov, who managed to identify the author of cyber-attack on the main digital product of the ministry called «DIIA» (in the form of creating a duplicate (fake) of this mobile application) and to develop another scenario for such an event – instead of imposing sanctions, he invited the author of the forgery to work in his Ministry (Huliichuk, 2021).

The main events that determine the dynamics of this worldview are news, new content (new that attracts attention), their units are content games, actors of content and context are newsmakers, which, in the first approximation, are divided into attractive everyday life and routinization of the flow of information, extreme catastrophe, extreme deviations, subcultural communities. Therefore, each organization, structural divisions have their official sites or pages, along with a constant newsfeed – a stream of news and new documents that determine changes in legislation, by-laws, orders, internal procedures that determine the actions of users, citizens, and potential scripts for digital solution of issues.

Network technologists, information-retrieval worldview form their neo-mythical and neo-religious worldview prototypology: hater, troller (in mythology klikusha), "fake exposers" (prototype of inquisitors and censors), astroturfers (internet callers), bloggers (heroes, fools, and clowns of information), pranksters and fraudsters (tricksters), etc.

During the war, the main actors of the digital society have a military (military) color: mass consciousness is influenced by military (military) and political bloggers, experts. The opinion of people during the war is affected by the number of subscribers and their popularity. Therefore, public relations structures and spokesmen of public administration structures as timely reaction to fakes and informational and psychological special operations of the enemy are actualized in public administration.

In regular information situations in public administration, actions regarding cyber-attacks, overloading of websites by organized mass access to these resources are actualized too. In addition, during the war, the problems of electricity grids, which can be attacked by an aggressor, and the presence of the Internet network (which, if not equipped with fiber optic cables lose the ability to connect consumers along with the loss of electrical supply) are added. Missile attacks on the electricity and Internet networks of Ukraine during the war determined in the self-reflection of public administration the need for remote work and communication of employees or a change in the spatial location of the work of civil servants since decision-making centers become the primary targets of missile attacks.

Therefore, remote work is a characteristic of systemic work in a digital society even during wartime, as well as metacognitive processes that

provide public administration have activity provision of online or remote work, operational communication, and interaction within the framework of communication platforms. During the modern war, analog means of communication were almost completely removed.

Military events determined new digital solutions for humanitarian aid to Ukraine and its citizens. United24 is a global initiative to support Ukraine, launched on May 5, 2022 by the Ukrainian authorities during the Russian-Ukrainian war, that works as a fundraising platform (Pavlysh, 2022). As of December 7, 2022, it was possible to collect more than 237 million dollars. Financial aid from 110 countries. Ambassadors of United24 became Andriy Shevchenko, Elina Svitolina, Liev Schreiber, Imagine Dragons team, Demna Gvasalia, Barbra Streisand, Mark Hamill, Alexander Usyk, Scott Kelly, Timothy Snyder, Brad Paisley, Michelle Hazanavicius, Catherine Vinnyk, Bear Grylls, Natus Vincere, etc.

Rationalization begins to be replaced or supplemented by affectation and mimesis (imitation) of the masses in emotional contagion. Sensitivity determines the extreme forms of emotion – the catastrophizing of consciousness, which replaces the ideology of safety and risk in a consumer society. The information-retrieval system in the structure of the economy occupies a niche of surplus profits, in exchange, distribution, delivery speed of individualized, mass-affective chains of consumption with the mediation of information-retrieval digitized systems. The catastrophizing of consciousness in a digitalized society has the characteristics of a newsfeed that repeats threats, their combination with real life conditions, and the loss of digital opportunities to work and communicate.

To understand the formation of the future, we will also consider negative extremes, borderline characteristics, precisely in the metadynamics of historical forms of consciousness. In the mythological worldview, the future is defined as a non-scientific form of anticipation (anticipatory reflection) – a prophecy related to the tradition of oral description of the final event associated with the acting characters. Extremely negative is everything that is defined as evil, in the form of an enemy, a stranger, a villain, a breaker of vows, a stream of gloom and terror (for the Greeks and Romans, this is the river Styx), as well as the underworld. Thus, the river Styx led to amnesia and oblivion even of the gods who did not keep their oaths and vows for years.

The underground world itself in the analytical psychology of K.G. Jung was rather a reflection of repressed fears, the shadow side of the human psyche. Most often, as J. Frazer noted, natural cataclysms are presented in myths, for example, the myth of the flood, myths of retribution, etc. These cataclysms determine the images of fears. In the religious worldview, the future is determined by insight, revelation, prophecy, the most vivid images of communication are still at the stage of manuscript transmission

of knowledge. For example, what is defined in Islam as "Maktub" – "so it is said in the book", is assumed in the Book of Fate.

The modern struggle for attention and clicks or switches in the information space has various platforms, such as Youtube, Facebook, Twitter, Tik-Tok, other platforms and private messengers, on which pages of state structures and public figures are often also created. But user surfing often has the characteristics of a chaotic movement or a mythological image of a journey.

Many researchers claim that the sequence and chronology of the Bible and the Koran determined the historicism of religious thinking – its linearity. Thus, one of the hypotheses, for example, the explanation of the most speculative book of Nostradamus' prophecies is considered as a statement of the reverse course of events of the prophecies in the Bible. The future is defined by eschatology, with apocalypse, with a terrible judgment and revival.

Extreme forms of fear are presented in the form of retribution for sin as a terrible judgment, these images are presented visually, in the imagery of church painting, for example, in H. Bosch's "The Seven Deadly Sins and the Four Last Things" and P. Bruegel the Elder's "Seven Deadly Sins" and "The Seven Virtues (Suite of Seven)". In these works, especially by H. Bosch, fear was formed by images of illness, death, a terrible judgment with an exit to heaven or hell (in which terrible monsters carry out retribution for sins).

Internet platforms cause their shadow zones, mortal sins and determine their faith-based values. Moreover, in the information space, people often find themselves in an "information bubble", as micro-targeted advertising throws to the user topics in which he has already shown interest. Therefore, there is a great challenge to the state as the central institution of society: "How to organize relations with the community in the information space and to break through the "information bubbles"? State institutions should be "inertial", which determines their stability and reliability, at the same time flexible and sensitive to the integrity of society.

Platforms that have a high ranking on the Internet and appear on top in search queries are the most influential in relation to users, so the competition is increasingly based on the processes of impression, choice, likes and views. So, bots and chat-bots are increasingly used as well as other systems of promoting by public administration structures, which have their own measurement systems in the digital society. But it is the irrational and emotional side of the user's choice and click that has a mythological and religious basis for the description-narrative, its images and belief in the reliability of information.

In the philosophical and scientific worldview, the future is determined by forecasting and science fiction – scientific types of anticipation,

scientifically based assumptions about the future. The peak of scientific (more precisely, scientific, and technical) prognostication fell in the 70-80s of the XX century. Extremely negative extremes were considered as scientific modeling of forecasts-warnings of global crises, threats of the death of all mankind as a result of world wars, natural and technological disasters. Accordingly, the theories of "global cooling", "global warming", nuclear winter, epidemics, the spread of mass types of weapons, etc. were formed. It was these theoretical directions that allowed the world to stay in the cold war between the two world systems without large-scale catastrophes and to form a dialogue between them.

The modern information-retrieval worldview, based on affective-informational mythology, is defined by a return to archetypes at the global level and their replication in the virtual world, sometimes returns to the non-scientific anticipations of experts, information and network technologists in the catastrophizing of consciousness, emotional affectivity, which attracts attention and keeps it, in the formation of panic and "contagion", in imitation and deprivation as informational marketing strategies in social networks.

And this is the most important component of hyperreality – the catastrophizing of consciousness. It is based on the fear of death from global threats, which may be scientifically rationalized on a global scale, but may not be objectively, scientifically researched. Multidirectional large-scale threats of a terrorist, military, natural, social, biosocial (supernatural), man-made nature increasingly bear the affective and sensational properties of hyperreality disasters.

The reproduction of the worldview is always determined by new systems of education, which makes a new identification of people by education, and therefore a new differentiation of people. As the Strugatsky brothers once wrote, a new identification leads to a new social division. We continue this view; identifications add new social and political conflicts and tensions and attempts at state resolution. All this defines new challenges to public administration. Because user training and deep learning systems are being formed for those who create the programs they use.

3.2. Modern mainstream in public administration policy development

As for the transformation of public administration systems, regardless of the country, it has a clearly defined direction, namely the focus on the active implementation of artificial intelligence and machine learning technologies. Artificial intelligence is a new type of technological science that researches and develops theories, methods, technologies, and system applications for modeling, improving, and enhancing human intelligence.

Artificial intelligence is designed to allow machines to think like humans and to give them "minds" (Søraa, 2023, pp. 5-6).

Artificial intelligence is closely related to machine learning. Machine learning is one of the main areas of this interdisciplinary field. According to Tom Mitchell's definition, machine learning is described as follows: "a computer program is said to learn from experience E with respect to some class of tasks T and performance measure P, if its performance at tasks in T, as measured by P, improves with experience E" (*Artificial Intelligence Technology*, 2023, p. 4). Generally speaking, the processing system and machine learning algorithms develop predictions by discovering hidden patterns from existing datasets. This is an important subfield of artificial intelligence, which is combined with such directions as data mining and knowledge discovery. The combination of the last two areas has created a subfield in machine learning called deep learning.

The main advantage of using artificial intelligence and machine learning is the ability to quickly analyze large volumes of data, the speed and accuracy of detecting anomalies and, accordingly, the ability to make predictions and/or obtain new information based on the analysis of existing data.

For example, network monitoring systems equipped with machine learning algorithms can correlate events and segment data to identify contingencies and correct those that could undermine network performance before an outage occurs. Machine learning is one of the options for implementing artificial intelligence. According to a study by the World Intellectual Property Organization (WIPO), 89% of all patent applications relate to this field of artificial intelligence, and 40% of all patents related to artificial intelligence are based on machine learning algorithms. In machine learning, in turn, the most developed and revolutionary areas are distinguished – deep learning and neural networks (*WIPO Technology Trends 2019: Artificial Intelligence*, 2019).

According to a WIPO study, 26 of the top 30 artificial intelligence patent applicants in the world are companies, and four are universities or research organizations. The leaders in patenting artificial intelligence in various fields are Japan, USA and China. Although Japan filed the first artificial intelligence patents, since 2014 China has led the world in the number of first patent applications, followed by USA. Together, these three-patent office's account for 78% of the total number of patent applications in this field of technology (*WIPO Technology Trends 2019: Artificial Intelligence*, 2019).

This rapid growth of patent activity determines the mainstream in the digitalization of social relations through the mediation of the Internet environment. And mainstreams determine the wave of reformation through self-organizing processes or through conscious politics. We

believe that these processes have a tendency towards co-evolutionary, joint development.

It should be noted that the COVID 19 pandemic had both real medical consequences and informational digital ones – with the activation of online technologies, information ordering of deliveries, physical distancing, and the formation of information and search normality. Therefore, the logistics of providing material products or aid of public administration becomes important.

Military events determined the issue of coping strategies in the public administration of providing public services for the sake of its population, such as the creation of "green corridors" for the evacuation of the population, their placement, provision, medical assistance – electronic recording of the services provided and the logistics of solving these issues.

On the other hand, public logistics does not have to harm the logistics of military personnel conducting combat operations or reveal their movements in social networks and open data. Modern OSINT platforms are becoming rapid wartime intelligence gathering platforms. In general, military events affect all spheres, since all threats are considered and often implemented during the barbaric waging of wars, when the aggressor does not limit himself to either genocidal or war crimes.

Public administration, as the main process of the central social institution of the state, must respond to significant changes in society that occur during a new type of war that is taking place in Ukraine. Therefore, the trends of digital transformation of society during the war determine the direction of changes in public administration. We will consider the trends of digital transformation during the war based on the conclusions of event of 2022 year in Ukraine (Lepskyi, 2022).

Firstly, the organizational process is a communicative process, since digitization determines changes in "public memory" such as the formation and updating of databases and messages, dynamic processes of information change (information streams, feeds, etc.). Significant changes in "public memory" occur from communicative processes.

Digital technologies determine the speed of filling, the form of these databases and software (the algorithmic basis of these processes).

Secondly, the digitization of information aims to obtain information rapidly, the formation of high-speed communications that unite the movement of information in social time and space. The movement of essential information determines all spheres of life – economics, politics, socio-cultural sphere, technology, military, and others. Digitization of the communication process allegedly permeates the organizational structure of these spheres, affects institutions and their activities, sets their information formats precisely in digitization.

Thirdly, fast communication processes in the dynamics of organizational processes create conditions for decision-making. In this organizational process of directing activities and selecting alternatives, digital technologies have the characteristics of an alleged "information prosthesis" (an additional decision-making support tool), an exoskeleton (selecting and enhancing those decision-making functions that are most significant), or/ and a decision-making "blender" as the unity of human rationality and intuition in human decision-making and the artificial intelligence of an information device, a gadget.

Fourthly, recently, artificial intelligence often becomes a "substitute" (a replacement) when decision-making, perhaps by default, is transferred to artificial intelligence and human intelligence becomes a prosthesis for artificial intelligence. In these processes (addition, reinforcement, linking or mixing, and replacement) digitalization is gradually shaping the change of public consciousness in the implementation of artificial intelligence.

Fifth, the digitization of information also affects the physical and material sphere of society's life. Digital technologies form the movement of society – the organization of logistics processes, information provision of effective supply chains in society. The orientation of society is also decisive, starting with the distinction and recognition of people, groups, organizations, the form and content of activity and behavior, their cooperation and co-evolution. This is the alleged scaling of observation and movement in social space and time, in the "bodily organization of society".

The industries in which artificial intelligence technologies were used the most were telecommunications, transportation, life sciences and medicine. In telecommunications, the main areas of application were computer networks and the Internet, radio and television, broadcasting, telephony, video conferencing, and VoIP (voice over the Internet).

In the field of transport, artificial intelligence technologies have been applied in aviation, creation of autonomous vehicles, driver/vehicle recognition, transport and road engineering systems. In biology and medicine, the main areas of use are concentrated in bioinformatics, biological engineering, biomechanics, drug research, genetics, medical imaging, nonresearched, medical informatics, nutrition, monitoring of physiological parameters, and public health (Chan, Hogaboam, & Cao, 2022).

The sphere of public administration is under the influence of these trends. One of the first areas where innovative information technologies were actively used can be considered the sphere of public finance (public procurement), and more precisely, the sphere of detecting fraud and money laundering (*Responsible Artificial Intelligence: Challenges for Sustainable Management*, 2023).

The specific trends caused by the modern Russian-Ukrainian war are the tendencies of confrontation between countries and the role of digital processes in this process and the actions of Ukrainian state in this dimension of striving for victory, preservation of sovereignty and territorial integrity, democratic system, European choice of civilizational foundations of development, preservation of Ukrainian identity.

If viewed from the position of an average citizen, the digital transformation of the state is a change from the traditional (live) format of interaction of a natural or legal entity with state (public) institutions to a virtual (online) format. While from the point of view of the state and the legal system transformation is a set of certain gradual stages, namely:

The first stage of the transformation is the implementation of electronic document circulation systems, electronic reporting and the corresponding recognition of their legal force on a par with analog documents.

The second stage is related to the creation of online platforms (services) with open data (registries) related to the results of public authorities and local self-government bodies activities, provided that data access levels are previously determined, and protection against unauthorized access and falsification is ensured.

The third stage combines the two previous stages and ensures the implementation of actor (subject, user) identification technologies in the virtual space, that is, the creation of digital signature systems that can be used during document circulation, reporting and gaining access to open data registers. At this stage, identification systems protection technologies are being developed.

The fourth stage is the stage of implementation of advanced data analytics systems: both open (published) and hidden (depending on the degree of secrecy) data (information), which provide proactive (preventive) activities to improve the processes of the previous stages.

Finally, the digital transformation receives its final design in the concept of the state as a digital platform, that is, a place (source) of obtaining certain state goods or services.

We will illustrate the stages of digital transformation that we have indicated on the relevant example of Ukraine, in most cases, the DIIA (2003). If you consider the functionality of this online service, you can find elements of each of the listed stages.

1. The use of the DIIA service provides document circulation between individuals and state authorities in matters of registering one's own business, obtaining permit documentation, licenses, social assistance, and other certificates without the need for direct contact with state authorities.

In general, the year 2003 can be considered the beginning of the electronic document management system in Ukraine, when the Law of Ukraine "On Electronic Documents and Electronic Document Management" (Pro elektronni dokumenty ta elektronnyi dokumentoobih. Zakon Ukrainy vid 22.05.2003 №851-IV [About electronic documents and electronic document flow. Law of Ukraine dated May 22, 2003 No. 851-IV], 2003) was adopted, which actively started to be implemented from 2014. Since this time, many information solutions appeared in the country: M.E.Doc, SOTA, FREDO, FlyDoc (Barannik, 2021) or Art-Zvit Plus, iFin, Sonata, Privat24 for Business (Malakhova, 2021).

2. DIIA service allows individuals and legal entities to access data from open registers, namely registers of motor vehicle owners, registers of lawsuits, traffic fines or the passport office. One of the forms of presentation of this information is the so-called electronic certificates – driver's license, foreign passport, e-Document, taxpayer card, vaccination certificates, child's birth certificate, vehicle registration certificate, which have become especially popular during the large-scale invasion of the Russian Federation in 2022 year. According to the EU portal on the quality of open data, Ukraine in 2022 took the 2nd place with a compliance level of 97%. Ukraine was overtaken by France thanks to the quality of data provision and portal sustainability (Open Data in Europe 2022, 2023).

Analogues of DIIA (with the possibility of monetization of own services) in the sense of receiving data from open registers are YouControl, OpenDataBot, LigaContrAgent, PravoSud, Court on the palm (Morkovnik, 2021). Applications of the electronic procurement system Prozorro (2023) can be classified as this category, which, on the one hand, is a system that regulates the process of document circulation in the field of tender documentation. On the other hand, application allows to get access by any interested persons to this data (open part) and to carry out analytical and statistical analysis of the data, which already refers to the fourth phase.

3. The DIIA service is not only a service for obtaining data or generating digital copies of documents, but also means of identification and identity confirmation – DIIA-signature allows to sign digital documents and carry out such operations as obtaining assistance, obtaining certificates, granting permission for the joint use of motor vehicles. Before the appearance of DIIA, one of the fairways in this direction was the applications of JSC AB "Privatbank", which allowed each individual or legal entity to obtain an EDS (electronic digital signature) in a few minutes, from 2021 due to a change in the legislation – KEP (qualified electronic signature).

4. The DIIA service, like any online application, has obviously its own data monitoring and analysis system, or separate ones are

being created (Dozorro, 2023). Regarding this direction, it can be confidently stated that in the vast majority of online applications, the function of analytical and statistical analysis of data (both registers and user requests) is provided on a prepaid basis, since the capacity of own data centers may not be enough to support the corresponding functions, for which it is necessary to rent additional capacity (in the cloud) elsewhere, for example on Amazon, Microsoft or Google. Therefore, it is not surprising that the Amazon corporation opened its representative office in Ukraine in 2021, and from 2022 a law came into effect in Ukraine, according to which "electronic services that non-resident companies (which do not have a permanent representative office in the country) provide to natural persons on the territory of Ukraine, are subject to VAT (20%)" (Pro vnesennia zmin do Podatkovoho kodeksu Ukrainy shchodo skasuvannia opodatkuvannia dokhodiv, otrymanykh nerezydentamy... Zakon Ukrainy vid 03.06.2021 №1525-IX [About making changes to the Tax Code of Ukraine regarding the taxation of taxation of income taken by non-residents ... Law of Ukraine dated 03.06.2021 No. 1525-IX], 2021). Cloud computing is in a great demand in Ukraine.

5. There is a possibility that thanks to DIIA the so-called "military-tech" applications will be developed and implemented, one of the examples of which is the function "eVorog" (iEnemy) (Fedorov: Ukraina stane providnoiu derzhavoiu u rozvytku viiskovykh innovatsii [Fedorov: Ukraine will become a leading power in the development of Ukrainian innovations], 2023).

It is known that artificial intelligence is based on three pillars: data, algorithms and computing capabilities. But it is not enough for the application of artificial intelligence in the field of public administration since there is a need to consider scenarios. Data, algorithms and computing capacity can drive the technical development of artificial intelligence, but technological development will only be spread over volumes of data without scenarios usage. That is why artificial intelligence technologies need to be integrated with cloud computing technologies, big data, and the Internet of Things (IoT).

Currently, the development and application of artificial intelligence needs to solve the following four problems (*Artificial Intelligence Technology*, 2023).

1. High professional standards: To be involved in the field of artificial intelligence, personnel must have significant knowledge of machine learning, deep learning, statistics, linear algebra and mathematical analysis.

2. Low efficiency. Model training requires a long work cycle, which consists of data collection and cleaning procedures, model training and adjustment, followed by its optimization.

3. Defragmented capabilities and experience. Applying the same artificial intelligence model to other scenarios requires repeating data collection, data cleaning, model training and tuning, and experience optimization, as the capabilities (performance) of the artificial intelligence model cannot be directly transferred to the next scenario.

4. Difficult update and enhancement. Model update and efficient data capture are very difficult tasks.

By now, smartphone-centric artificial intelligence has become the industry consensus. More and more smartphones will have artificial intelligence capabilities. According to estimates by several consulting agencies in the UK and the US, approximately 80% of the world's smartphones will have artificial intelligence capabilities by the end of 2023 (*Artificial Intelligence Technology*, 2023). Therefore, it becomes clear why the state platform "DIIA" is oriented specifically for use on smartphones.

In the conditions of the war, the state platform "DIIA" showed its effectiveness, starting with the preservation of electronic storage of documents in case of forced migration or the destruction of housing, where the most important documents for a citizen were located; re-registration of vehicles; simplification of the system of financial support of the Armed Forces of Ukraine; receiving assistance to people affected by hostilities; implementation of innovations supported by Elon Musk – Starlink, ChatGPT and so on.

During the modern war, which in terms of communicative content is the first war that has reflection and representation in real time in social media and physical space. It has been compared to the war in Vietnam, which in terms of communication was the first war to be represented on television.

Sixth, the main purpose of war is to preserve one's own will to fight in the vital activity of society and to destroy the will of the opponent. In this matter, the war appears in the information-digital dimension as demoralization, as the creation of significant conflicts in the "memory and consciousness of warring societies" – these processes are known as propaganda and counter-propaganda, the conduct of military-psychological warfare with the help of digitalized means (which have disorientation processes, untruth – fakes, special information operations, intimidation and panic formation), destruction of consciousness and historical memory, lowering of the moral component of the military-political leadership, society and the Armed Forces, or/and the creation of conflicts between them.

Disorientation and demoralization have both a spiritual and psychological component, as well as a material and physical one – in cyberwar – by means of the destruction of speed processes, the destruction of the effectiveness of the "information prosthesis", "exoskeleton", "mixer" and "substitute" – in human interaction in war and artificial intelligence, and de-scaling of movement and observation. The opposite process is not destruction, but the development of speed and efficiency of information and digital technologies as a means of obtaining competitive and military advantages.

Among the significant changes during the war are: firstly, military tools for destroying the enemy's will in the moral and volitional dimension; secondly, tools for the protection of public "consciousness", "memory" and "body" of the military-political leadership, society and the Armed Forces; thirdly, the development of information and digital tools and artificial intelligence as faster and more effective compared to the enemy.

Conclusion

We discovered metacognitive changes as the evolution of worldviews and their impact on public administration policy, focusing on the shift from a philosophical and scientific worldview to an information-retrieval worldview.

Metacognition is the awareness and understanding of one's own thought processes, or "thinking about thinking". It involves the ability to reflect on, monitor, and control one's cognitive processes, such as problem-solving, learning, memory, and decision-making. Metacognition is a unity of regulatory actions, self-observation of thinking, and control over cognitive activity.

The philosophical worldview, which was dominant during the Renaissance, emphasized wisdom, truth, justice, and human and state centrism. It was shaped by philosophers, scientists, engineers, statesmen, and entrepreneurs who created prototypes, models, and production systems. Nation-states drove the development of industrial and mass-media societies.

With digitization, the information-retrieval worldview emerged, characterized by a focus on information, novelty, emotions, and impressions. This new worldview is dominated by affects and emotions, with content and context being provided by media workers such as bloggers, influencers, and social media managers. The main events driving this worldview are news and new content that captures attention.

This shift has impacted public administration, with the rise of social media, search engines, and data banks as new mediums for disseminating information. In times of war, digital society actors take on military and political roles, influencing public opinion and shaping the actions of public administration structures. Remote work has become a crucial aspect of systemic work during pandemic and wartime, with metacognitive processes enabling online collaboration and communication.

The modern struggle for attention is evident in various digital platforms, leading to an "information bubble" challenge for state institutions. The irrational and emotional side of user choice on these platforms is rooted in mythological and religious beliefs, and the competition for attention is based on impressions, likes, and views.

Artificial intelligence and machine learning are actively being implemented in public administration systems, focusing on processing large volumes of data, detecting anomalies, and making predictions. The trends of digital transformation impact the direction of changes in public administration. Key aspects of this transformation include: 1) digitization of the communicative process, affecting public memory through the formation and updating of databases, and dynamic information changes; 2) rapid information dissemination through high-speed communication channels, affecting various spheres of life such as economics, politics, socio-cultural, technology, and military; 3) the use of digital technologies as decision-making support tools, exoskeletons, or "blenders" that combine human rationality and artificial intelligence; 4) the gradual replacement of human intelligence with artificial intelligence, reshaping public consciousness in the implementation of artificial intelligence; 5) the impact of digital technologies on the physical and material aspects of society, such as logistics, supply chains, and the organization of social movements.

Artificial intelligence technologies have significantly impacted various industries, including telecommunications, transportation, life sciences, and medicine. In public administration, digital transformation has resulted in a shift from traditional interaction to virtual formats with state institutions. This transformation comprises several stages: 1) implementing electronic document circulation systems and recognizing their legal force; 2) creating online platforms with open data registries, ensuring data access levels and protection; 3) implementing actor identification technologies in the virtual space, such as digital signature systems; 4) implementing advanced data analytics systems for proactive activities to improve earlier stages; 5) conceptualizing the state as a digital platform providing state goods and services. The Ukrainian online service DIIA exemplifies these stages, offering document circulation, access to open registers, identification and identity confirmation, and data monitoring and analysis systems. It is anticipated that "military-tech" applications will be developed and implemented through DIIA.

Artificial intelligence technologies rely on data, algorithms, and computing capabilities, but their application in public administration requires the integration of cloud computing technologies, big data, and IoT.

Significant changes are accelerated during wartime. Any war involves military tools for destroying the enemy's will, tools for protecting public consciousness and memory, and the development of information, digital tools, and artificial intelligence to outpace the enemy. During the modern war in Ukraine, DIIA proved effective in various aspects, including document preservation, vehicle re-registration, financial support and assistance to people affected by hostilities. The current war reflects the impact of digital transformation and artificial intelligence technologies in the communicative sphere, with real-time representation in social media and physical spaces.

Regarding metaprototypes affecting the interaction of public administration and digitization processes as the formation of information-retrieval thinking and shaping the future in interaction with artificial intelligence, it is possible to present the main classification of this interaction at the metalevel. The classification of digitized technologies in human-artificial intelligence interaction is shown:

- as a prototype of a supplement – a "prosthesis" (with two options of supplementing a person with artificial intelligence and supplementing artificial intelligence with the missing qualities and processes of a person);

- strengthening of the "exoskeleton" (strengthening of a person and his abilities with artificial intelligence);

- connecting and mixing solutions in human-artificial intelligence interaction – "mixer" (creating the diversity of human-artificial intelligence interactions in various software and information applications, with the main process of self-organization and formation of attractors of this interaction);

- delegation or replacement of human decision-making by artificial intelligence – "substitute" (replacement of individual processes of human communication and decision-making by artificial intelligence based on mass determination of people's choices and the application of statistical decision-making procedures, and therefore the transition of operational actions in public administration to the delegation of these procedures to artificial intelligence.

These prototypes can determine the development of the "consciousness", "memory" and "body" of society – its resilience and will or vulnerability and destruction during war.

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CUESTIONES POLÍTICAS

Vol.41 Nº 79

Esta revista fue editada en formato digital y publicada
*en octubre de 2023, por el **Fondo Editorial Serbiluz,***
Universidad del Zulia. Maracaibo-Venezuela