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Digital cities and interactive stakeholder policy

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Abstract. The paper reveals the evolution of digital development of modern cities in the context of new industrialization. Urban digitalization is being reassessed as a process of formation of a hybrid socio-economic system, with the leading role of institutions and institutional mechanisms of a novel type. Service industries are shown to be the main institutional models for development of the digitalized urban economy. A proactive institutional policy of digitalization is substantiated. The specificity of the effects of urban digitalization is described explicitly. The framework of a smart city's interactive stakeholder policy is theorized.

1. Techno-institutional evolution of digital cities and its contradictions

Adoption of digital technologies (Big Data, artificial intelligence, robots, blockchain, etc.) into the life of modern cities is gradually shifting from futurology to operationalization. However, it is not always clearly understood that the development of the so-called smart cities and, more broadly, urban digitalization are not mere technological processes, but techno-institutional ones that require an integrated approach to regulation and strategic planning [1]. The patterns of digital development of modern cities are related to two main implementation forms: formation of a 'digital skin' of the city (multisensory digital system of total monitoring) and implementation of a 'smart' approach to city management through the use of artificial intelligence and Big Data in making managerial decisions [2]. Both of these processes are realized in a complex techno-institutional environment, in a kind of ecosystem formed by stakeholders (groups with specific interests in the city), institutions (norms, rules, procedures, collective mental models, status functions of objects and subjects), digital technological infrastructure, and physical and social environment.

Digital cities are being developed in the context of new industrialization, which is considered as a unity of the processes of forming Industry 4.0 (a complex of blockchain technologies, robotization, Big Data, etc.) and a pool of service industries with focus on knowledge-intensive business services (KIBS-industry), and creative and cultural industries. New industrialization is institutionalized, but this process occurs with pronounced contradictions and gaps. Digital development of cities entails increased communication activity and transparency of the territories in the Internet, development of crowd activities (crowdsourcing, crowdfunding), and strengthening of the role of the population in formation of the information space of territories in the Web 2.0 environment.

We have reassessed urban digitalization as a process of the formation of a hybrid socio-economic environment, where institutions and institutional mechanisms of a new type are critical to ensure various digital transactions. The service industry performs several interrelated functions during digital transformation of the city. The absorption function of the service sector implies massive job creation in service industries during the period of reduction of industrial workers caused by robotization, and



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creation of new jobs for workers in automated service industries (finance, legal business, trade, etc.). The innovative function of the service sector is associated with implementation of high potential for creating and commercializing service innovations, including process (new types of services and methods of service provision), technological (new technologies for providing services, for example, chat bots and mobile applications), and marketing (creative solutions, content and design) innovations. The collaborative function relates to the economic nature of the service, which involves collaboration, negotiation and (ideally) co-production, i.e. deep involvement of the consumer in processes of design and service provision. Service industries most organically include network, project and cluster formats, which are the main institutional models for development of the digital urban economy.

The potential of advanced development of digital cities is associated with formation of an economy based on digital technologies of ultra-fast processing of large amounts of data, intelligent robotics, the Internet of things, blockchain, etc. It has emerged as a result of the second wave of ICT progress and the need to replace expensive intellectual capital with technological one. The prospects for digitalization of the modern urban economy are associated with the following long-term trends: expansion of the scale of decentralized transactions; reduction in the volume of ownership rights in favor of temporary use rights; shift from blue-collar workers to industrial robots and from white-collar workers to blockchain and chat bots; the growing role of the expert community and the creative class; focus on continuous improvement and innovations; competition for consumers in the form of customization and generation of expressions; expansion of the amount of available information; continuity and interactivity of communications; increased transaction speed.

Robotization plays the key role in the urban economy, and it is necessary to distinguish between its two main forms. Robotization in the narrow sense implies replacement of people with robots in business processes and professions related to physical and low-skilled mental labor. This process is actively developing in most of the old industrial cities and results in their de-industrialization. New production facilities created require an order of magnitude fewer workers. Digital robotization is defined as displacement of people from the sphere of medium- and even high-skilled mental labor and their replacement with software. The process refers to finance and other service industries. This distinction has methodological implications for developing effective regulation. As a result of the urban digitalization, a wide range of new challenges, threats and risks arise – economic, legal, ethical, ethnic, societal, paradigmatic, etc. Therefore, a proactive institutional policy is required for digitalization. Control and oversight mechanisms currently employed need to be adapted to the specific challenges of large-scale digital adoption. In addition, the nature of digital technologies aimed at their rapid growth and continuous improvement creates ample opportunities for development of voluntary institutional initiatives. They are expected not to replace government regulation, but to fill legal ‘gaps’ in this area and to supplement existing norms and forms of control. Flexibility, adaptability, relative freedom to follow voluntary norms and obligations ensure their high potential for constructive multilateral interaction in strategic regulation of economic digitalization. Voluntary institutional initiatives can be developed under the patronage and support of the state; result from industry self-organization or the policies of individual large companies; be formed in line with partnership between business and non-governmental organizations, etc. In this regard, the institutional mechanism of regulatory ‘sandboxes’ should be scaled up and developed more intensely at the regional level.

Informative specificity of the effects of urban digitalization is associated with features of digitalization as a process of a high level of complexity, which:

- is characterized by generational heterogeneity of both digital technologies themselves and forms of digitalization;
- is in tune with a rapid technological pace, which causes ambiguity and controversy in the definitions of both digital technologies and digitalization and leads to high level of uncertainty in estimates, forecasts and classifications;

- is of trans-, multi- and interdisciplinary (in the field of research and development), intersectoral (in production), multi-segment (in the field of sales), interdepartmental, interregional and international (in the field of regulation) nature;

- allows interpretation of digital technologies as total purpose technologies with scaled up potential and risks characteristic of conventional technologies and extremely high degree of their internal diversity (technological structure);

- exhibits tremendous opportunities for expanding cooperation and convergence with other emerging technologies, traditional and new industries, which helps to cope with the competitive-oriented scenarios of technological policy development;

- requires a combined technological and institutional analysis with focus on meso-institutions (digital-specific rules and regulation mechanisms).

The key threats that hinder effective institutional regulation of urban digitalization include:

- a wide range, diversity and growing number of digital technologies in production, services and urban management areas;

- uncertainty associated with the lack of effective experience in urban digitalization management;

- the lack of unified definitions of digital technologies and processes adopted at the international and national levels;

- a rapid pace of digitalization that narrows the scope for making strategic decisions in terms of their regulation, the development of labor markets and education;

- asymmetry of information in the field of digitalization between science, industrial business, regulators and the public;

- the presence of a complex of information security risks in case of implementation of the city's 'digital skin' projects;

- the ongoing lag in technology for standardization of interactions between people and robots (robotic-human processes), which can be overcome within 5–10 years in the conditions of intensive robotization;

- the potential inability of national governments to timely respond to the digitalization of the economy by issuing comprehensive laws in this area of regulation.

We believe that development of a new approach to strategic urban management, interactive stakeholder policy, is a key direction to be addressed in order to overcome a set of adverse effects of digitalization of territories based on the smart city model.

2. Interactive stakeholder policy in the smart city: theory outlines

Urban digitalization creates many risks and adverse effects; however, it forms a multi-tiered 'window of opportunities' for different categories of city residents and external stakeholders from tourists to business partners. The city treated as a complex evolving ecosystem in which multiple groups with different interests coexist is an important feature of the research by the Bloomington School founded by the Nobel laureate E. Ostrom [3]. Disregard of the relevance of communication with various large and small groups of the population to meet their interests, values, beliefs and perceptions hampers implementation of the interactive stakeholder policy in the smart city.

Involvement of citizens in solution of issues related to urban development is not anymore considered as optional and auxiliary tool for strategic planning and management. This is evidenced by the relevant paragraph (clause 6) and target measures stated in the Decree of the President of Russia #204 *On national goals and strategic objectives for development of the Russian Federation for the period up to 2024* of May 7, 2018. Communication policy aimed at engaging different groups of the population is becoming a critical factor in interactive urban stakeholder policy. The nature of the basic notions of communication concepts for development of territories is highly controversial. However, the methods and tools for development and practical implementation of interactive urban strategies are not integrated and often blurred.

Decision-makers associate communication urban policy and stakeholder engagement with a purely commercial marketing approach. This simplistic perception reduces a complex interactive

communication policy of stakeholder engagement to a set of simple quick creative solutions. Continuous, interactive communication with stakeholders is replaced by slogans, bright (but often typical and uninformative) logos, sporadic PR campaigns, and involvement of the best advertising agencies. Participation in competitions for the smartest, most cultured and green city and disregard of communication with internal stakeholders is sharply criticized by M. Kavaratzis and the scientific community [4].

Let us pose a question: why is a simplified understanding of interactive stakeholder policy so common? This question implies a theoretical answer: in a broad sense, communication urban policy can be attributed to the heterodoxia of economic science. It is based on highly realistic prerequisites of analysis, it has an interdisciplinary nature, which is extremely uncharacteristic of the neoclassical mainstream, and it hardly fits into the traditional academic space of the economic research. Similar to most heterodox research areas, an objectively important factor in the development of interactive stakeholder policy is intensive interaction, a combination of various non-standard approaches, exchange of productive ideas, and transition to hybrid, synthetic, and integrative methodologies. The communication policy of the smart city, like the smart city itself, is currently at the stage of scientific space formation, which inevitably leads to simplification. The scientific community strives to move forward in order to form a well-developed analytical framework with practical applications and interact with fundamental developments in the field of evolutionary and institutional economics.

Fundamental works that combine the institutional and evolutionary approach and the communication interactive approach to development of territories are not currently available in the world economic science. There are few studies, for example, by E. Rogers [5] and J. Metcalfe [6]. However, integration of the institutional evolutionary approach and the theory of innovation diffusion are required to ensure an effective communication policy that involves various groups of citizens and to create a mechanism for interactive management of the development of the smart city based on interdisciplinary synthesis. The mechanism should take into account the dynamic balance and complexity of communication processes in an oversaturated media environment. We believe it is the most promising direction for further research.

In recent years, there has been a growing interest in the use of social media for communication purposes, which is associated with a sharply increased number of Internet users and the time spent on social media. The number of Internet users in the world has not reduced over the years and showed an increase by 80% from 2012 to 2017. In 2017, the number of Internet user was 3.77 billion people and attained 4.54 billion people by 2020. Digital mobility has grown, and nowadays more than 5 billion people all over the world use smartphones. The number of social media users is growing every year, and from 2019 to 2020 their number increased by 9% and amounted to 3.80 billion people [7]. These megatrends should be considered and used in the interactive stakeholder policy.

Web 2.0 technologies, including blogs and microblogging, wikis and social media, photo and video hosting, etc., have become urgent working interactive communication tools to convert the reputation and digital social networks of users into the value equal to social capital. These tools need to be incorporated into the communication policy of the smart city aimed at involving citizens in interactive management with regard to their specifics. Hashtags and geolocation should become integral components of city promotion in the Web 2.0 environment.

M. Castells, an outstanding theorist of the network society and postindustrial economy [8], describes the current status of media as a decisive means of communication, including a number of communication organizations and technologies that combine mass communication and mass self-communication. He defines media policy as the policy in the media environment realized by means of media technologies. Assume that the communication policy of the city is a conceptual framework for implementation of strategically oriented actions to promote the values, views, goals and objectives of the city development in mass consciousness (and subconsciousness) of target stakeholders and their involvement in the process of interactive management through controlled reflection in the media environment [9, 10].

Studies have shown that the communication space of Russian cities faces typical problems. Let us list some of them. The peak publication activity of the urban media environment falls on various federal, regional and local political campaigns. These are typically elections to executive bodies and development of development strategies. After the peak of activity, there is a sharp drop in media activity. The overwhelming majority of publications of the pro-government media are uncreative, the style indicates political and financial dependence, and journalism is routine and clichéd, with numerous restrictions. The main thematic blocks cover such issues as tourism, the history of the city and region, the state of the economy, culture and sports. The main emphasis is on the top officials of the city, region and subdivisions, that is a person-centered approach. The alternative pro-government media covers a large block of publications related to criminals, incidents and emergencies. Thus, the media environment is divided into two parts – a pro-government hyper-positive agenda and an alternative, emphatically negative one. In addition, the publications contain a distorted view on stakeholders which is dominant among all groups of politicians and local political scientists. A huge layer of heterogeneous internal stakeholders remain beyond the scope of the urban communication policy and are reduced to comforting socially and politically active groups. Overall, this communication policy provides an extremely narrow view of the city. Hyperpositive assessments of the urban environment without dialogue, constructive discussion and objective analysis prevail. Apparently, it is caused by a powerful effect of inertia, directiveness of urban journalism and catching-up city branding, and does not correspond to modern digital trends. This practice is polar opposite of the interactive stakeholder policy.

The current range of online services provides any stakeholders of any city, especially a smart one, with information from official sources, municipal websites, and state-run media and bloggers. At the same time, stakeholders can do fact-checking, that is, correlate official information with real information obtained from friends on Facebook, Vk, Twitter, Tik-tok, etc., thereby looking at the city through the eyes of internal stakeholders. An interactive stakeholder policy of the smart city must consider trends and ongoing profound changes in communication channels and technologies.

Synthesis of the Internet and wireless communication, a combination of traditional and digital media, development of Web 2.0 technologies, large-scale introduction of broadband data transmission and an increased speed of information processing, adoption of blockchain technologies and other digital trends in urban communication space development require a new interactive stakeholder policy for cities and their brands. First of all, this is digitalization of communications that form the city's brand, which allows internal and external stakeholders to create 24/7 personal media systems using SMS, retweets, likes, posts, and comments. To date, investors, tourists, workers, prospective students, potential residents and other groups of non-residents get to know the city via a computer or smartphone. Therefore, the identity of the urban environment and its competitive advantages must be available in a creative digital format.

In terms of the mainstream of city branding, the communication policy of cities and regions focused on one-way advertising, i.e. advertising without feedback, which is targeted on the audience in traditional media, and the use of reliable techniques such as press releases or press conferences, are still efficient. We believe that they can be recognized as relevant, but only within the framework of the broader media policy of the city brand, which is interactive and systemic. This is all the more important as the boundaries between PR, advertising, communications, marketing and other forms of brand promotion are becoming less evident and indicate a powerful convergence trend. This also refers to the outdated opposition of online and offline communication.

Digital communication resources, such as interactive electronic publications and multimedia, provide distance communication with the target audience. Target audience should be able to virtually visit the city and observe the events online. Interactivity of the stakeholder policy should be an important advantage of the smart city. The shift of urban communications towards digital initiatives poses risks that must be taken into account at the initial stages of the interactive policy formation. The content should be selected and created creatively, since expansion of the audience can cause an

ambiguous interpretation of the event and subsequent relaying of errors to social networks. The cost of the mistake in a fast digital world is high.

New channels of brand communications of the regions include not only social networks but also crowdsourcing projects that allow for close interaction and joint work with various target groups to generate new ideas about the city. Nowadays, storytelling about the city is mainly delegated to local authorities, the media or marketing agencies hired to introduce the brand, which leads to dominance of official and hyper-positive discourse. It is necessary to translate the communication policy of the city into a more informal format. Citizens, local bloggers and activists should be engaged as city ambassadors, brand ambassador networks and curated network platforms should be formed, city story festivals, etc. should be organized. Traditional information identified by stakeholders as advertisements (logos, slogans, handouts, articles, press releases, travel sites) should be supplemented with contextual information that is not directly related to advertising. This trend is referred to as embedded marketing. Examples of embedded marketing are the use of a specific city environment in the movie, TV show, and other multimedia content formats. This indirect communication technique can be referred to as place placement. The augmented reality and gamification technologies to immerse the user in the urban content are highly potential. Moreover, the interactive stakeholder policy should not include any distortions and attempts to mislead.

The growing intensity of Internet communications requires introduction of online tools into the interactive urban policy or a continuous communication policy based on Web 2.0 technologies.

3. Conclusion

Interactive stakeholder policy is a direction of actions of city and regional authorities to involve different groups of interests (stakeholders) in the place development and promotion of its brand. Digitalization certainly expands the possibilities of interactive stakeholder policy. But it is important to consider the implicit, latent and lagging effects of digitalization when developing this policy. The logic of digitalization is associated with minimizing the transaction costs of city management in accordance with the Coase conditions for an optimal market economy. The revolution of transaction costs in urban practice is expressed in the fact that the need for intermediaries disappears, the management of urban processes and systems becomes automatic, and transaction costs ("harmful friction in the economy") are sharply reduced. However, in reality, the scenario associated with the formation of a homogeneous institutional system on an urban scale is usually not implemented. The blockchain example is illustrative. Blockchain is a digital technology for implementing decentralized transactions that does not require intermediaries. Blockchain technology of a distributed ledger leads to maximum decentralization and democratization of city governance. According to most forecasts, blockchain will lead to a complete decentralization of urban management, maximum transparency of all processes and direct democracy. In practice, the urban world of strange and intricate interweaving of old and new institutions, decentralized and hierarchical practices and modes of coordination most often arises. At the same time, the democratization of urban life is intertwined with the concentration of power, and the transparent media-environment generates polarization and mutual distrust.

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