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Review article

SMART DIGITALIZATION AND PUBLIC SERVICES IN THE EU

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ABSTRACT

„Smart digitalization "is a term which describes the implementation of contemporary information technologies and application of digital solutions in improving various public services in society. The main aspect of smart digitalization is the promotion of smart digital services such as „smart cities ", „smart government "and „smart administration ", which represent digitalization of various local, regional and central government activities in the true creation of a common digital platform with a unique approach. A common and unique platform of public services can assure their provision and delivery to various users in society, and the possibility to choose the type of services which they need in daily life. Another aspect of „smart digitalization "is participation in political life of the community by using digital services as a main tool to canalize political processes in the community. An additional element of „smart digitalization "is the harmonization of digital public services, which can assure efficient and economic functioning of public institutions, central and local administrative bodies and different levels of government authority. That approach can be important in the context of green transformation of the EU, which represents one of the main EU public policies, connected with the transition of the European economy and society in the direction of sustainable development. This paper will analyze the main elements of the integrative approach in the implementation of digital technologies in public services. Elements of the integrative approach can be divided according to the implementation of digital technologies in central government digital services, regional government, digital services and local government digital services. The second division of smart digitalization can be divided into e-democracy and e-administration, where e-democracy represents the implementation of information technology in democratic processes in society, and e-administration includes implementation of information technologies in the functioning of administrative bodies and the delivery of public services and goods to the citizens, companies and other social, economic and political subjects in society. In this paper as a research methodology deductive and synthetic approach will be used to describe the main aspects of the implementation of a „smart digitalization "policy and analyze its influence on the sustainable transformation of European society. The applied methodology needs to explain how the implementation of "the smart digitalization "policy in public services impacts on green transition

and the social transformation of European society in the direction of sustainable development and strengthening energy independency.

Keywords: *public services, Smart digitalization, sustainable development*

1. INTRODUCTION

Smart digitalization represents the implementation of information and communication technologies in various aspects of social, economic and political life of the modern social community. The application of smart digital technologies is oriented towards implementation in public and private services; to assure better quality of delivered goods and approach to services.[1] The green technologies is the crucial part in smart digitalization with the main purpose of ensuring sustainable development and better availability of goods and services in society. It includes all aspects of services provision and delivery of goods. In that sense, smart digitalization is a term which can be applied on the private and public sector.[2] The implementation of smart digitalization is usually efficient in the private sector, because of market conditions and high competition. Public institutions and governmental bodies needs more time to implement digital solutions in public service provision, because of the lack of direct pressure for change and immediate adoption of public sector and the different functioning of public bodies. Pressure and petition for change in public institution and governmental bodies usually comes as result of political processes caused by social and economic changes in society.[3] When social and economic changes derive pressure in political institutions, then it results in change in administrative and governmental bodies, public institutions and public utilities in the community.

Digitalization and green transformation of the EU are challenges in the future development of the EU and member states. They are at the focus of interest for politicians, scientists, civic society and other stakeholders.[4] One of the main elements for successful transformation is the question of effective digitalization of public institutions and governmental bodies. Smart digitalization of public services includes the implementation of information and communication technologies in combination with artificial intelligence (AI) solutions. The most important aspect of smart digitalization is the possibility of interaction between users and public institutions which provide public services and goods. The interactive approach is

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1 Gilbert, P.; Thoenig, J., *Assessing Public Management Reforms*, Palgrave Macmillan, Cham, 2022.

2 Mondejar, M. E. *et al.*, *Digitalization to achieve sustainable development goals: Steps towards a Smart Green Plane,* Science of the Total Environment, Vol 794, 2021, pp. 1 – 20.

3 Yang, K.; Rho, S., *E-Government for Better Performance: Promises, Realities, and Challenges,* International Journal of Public Administration, Vol 30, Issue 11, 2007, pp. 1197 – 1217.

4 Vial, G., *Understanding digital transformation: A review and a research agenda*, The Journal of Strategic Information Systems, Vol. 28, Issue 2, 2019, pp. 118 – 144.

important in two main directions: it assures citizens participation and controlling mechanisms in democratic political institutions and providing additional tools for the development of quality standards in public service delivery. The implementation and development of smart digitalization in the public sector, with the application of smart digital technologies and clever AI solutions can be efficient additional tools in green transformation of the EU. Green transformation of the EU includes the implementation of technological solutions with sustainable development, and smart digitalization can actively provide conditions for achieving elements of sustainable development.[5] The main aspect of smart digitalization in the future will be the implementation of AI application, but the basic problem is in the lack of a regulatory framework for the implementation of AI solutions. According to the development of green transformation of the EU economy, smart digitalization with the implementation of modern digital technologies open up many new questions in the modernization of the functioning of public authorities on all levels of government organization: central, regional and local. Every level of government organization poses various questions according to specific elements of public services delivery. The local level of government organization is focused on managing local public tasks and citizen participation in political activities of the local community.[6] The regional level of government organization is focused on highly decentralized public services and their provision to citizens, according to the dynamics between central and regional authorities.[7]Central level off government organization is more focused on integration of national (digital) public services and their integration and coordination with the services at local and regional level.[8] The capacity for the development of smart digital services is positioned in central government authorities, but the dynamics of implementation is on local government authorities.[9] This paper aims to determine the role of smart digital technologies, including AI application, in the modernization of public services, and their position in green transformation of the EU economy and institutions.

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5 Andersen, A. D., *et al., On digitalization and sustainability transitions*, Environmental Innovation and Societal Transitions, Vol 48, 2021, pp. 96 – 98.

6 D'Inverno, G., Moesen, W., Witte, K., Local government size and service level provision. Evidence from conditional non-parametric analysis, Socio-Economic Planning Sciences, Vol 81, 2022, https://doi.org/10.1016/j.seps.2020.100917.

7 Cuadrados-Ballesteros, B., Garcia-Sanchez, I., Prado-Lorenzo, J. M., Effect of modes of public services delivery on the efficiency of local governments: A two-stage approach, Utilities Policy, Vol 26, 2013, pp. 23 – 35.

8 Wouters, S., *et al., Strategies to advance the dream of integrated digital public service delivery in inter-organizational collaboration networks*, Government Information Quarterly, Vol. 40, 2023, pp. 1 – 14.

9 Andersson, C.; Hallin, A.; Ivory, C., *Unpacking the digitalization of public services: Configuring work during automation in local government,* Government Information Quarterly, Vol 39, 2022, pp. 1 – 9.

2. METHODS

The methods used in this paper will be induction and deduction. The deductive approach will be analysis of the main aspects of smart digitalization and their implementation to public services. The inductive approach includes presentation of the development of smart digital solutions in the context of green transformation and its implementation in public services. The main aspects of smart digitalization include elements for the application of information and communication technologies, which can be applied in the delivery of goods and availability of services. Special attention will be paid to smart digitalization of various governmental and public services, which is important for the green transformation of technologies and sustainable development in society. An additional aspect will be the issue of implementation of artificial intelligence (AI) in the development of smart digital solutions in the context of green transformation of EU society. After deductive analysis, elements of smart digitalization, which include the possibility of the application AI solutions, the possibility of implementation digital platform will be presented which encompasses all aspects of public services digitalization. Secondly, aspects of smart digitalization will be the description of the regulatory framework which defines elements for implementation of AI solutions in the functioning of digital public services. Inductive approach will be used in explanation of implementation smart digital platform in combination with AI solutions to assure transformation of the provision of public services and efficient delivering of public goods. That will explain the position of smart digitalization in green transformation and define the role of modern digital solutions for the sustainable development of society, based on the implementation of new digital technologies and practical scientific solutions. This approach will also show how smart digitalization stimulates green transition of EU society and the economy in the context of global climatic changes.

3. ANALYSIS OF SMART DIGITALIZATION IMPLEMENTATION IN PUBLIC SERVICES

3.1. The main aspects of smart digitalization in the public administration

Smart digitalization is usually defined as the implementation of modern information technologies to support various aspects of social, economic and technical activity in the community.[10] In public administration, smart digitalization is focused to assure efficient public services and support public institutions in their role and

[10] George, G.; Schillebeeckx, S. J. D., *Digital transformation, sustainability, and purpose in the multinational enterprise,* Journal of World Business, Vol. 57, Issue 3, 2020, pp. 1 – 8.

position of the instrument for efficient implementation of political decisions in society. For the purpose of this paper, the implementation of smart digitalization in the public administration and public services and specific elements of this application will be analyzed, according to the green transformation of EU society and public institutions.[11]

The second element of smart digitalization implementation is the division into e-administration and e-democracy, as the two main types in the application of information technologies.[12] E-democracy is focused on digital interaction between citizens and political authorities, whereas information and communication technologies provide the digital framework for the development of political relations in the community. In that sense, e-democracy provides a digital playground for democratic political processes in society.[13] These processes can be divided as direct and indirect tools for citizens' participation in the political process, which also includes participation in the decision making process.[14] Digital forms of direct or indirect participations can be in formal or informal ways of political participation. Formal ways of political participation are digital forms of elections or plebiscite and referendum as direct forms of the citizen's will in various issues important for the dynamics of social life in the community. Informal ways of political participation are e-petitions, debates and public initiatives on various social, economic and political matters in the community. The implementation of smart digitalization in democratic processes provides more open possibilities for better citizen participation.[15]Smart digitalization creates a virtual framework for an interactive approach and communication between citizens in the community. This type of communication is most popular as the means of public discussion between various participants with the intention to offer the best solutions for organizing public life in society. Digital participation of citizens represents a contribution to the development of new forms of democratic innovation in contemporary society.[16] Special elements of e-democracy are openness, inclusiveness and participativeness

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11 Wallis, J.; Zhao, F., *E-Government Development and Government Effectiveness: A Reciprocal Relationship*, International Journal of Public Administration, Vol. 47, Issue 7, 2018, pp. 479 – 491.

12 Anderson, L.; Bishop, P., *E-Government to E-Democracy*, Communicative Mechanisms of Governance, Vol. 2, Issue 1, 2005, pp. 5 – 26.

13 Atkinson, R. D.; Leigh, A., *Customer-Oriented E-Government*, Journal of Political Marketing, Vol. 2, Issue 3 – 4, 2003., pp 159 – 181.

14 Irvin, R.; Stansbury, J., *Citizen Participation in Decision Making: Is it Worth the Effort?,* Public Administration Review, Vol 64, Issue 1, 2004, pp. 55–65.

15 Holzer, M.; Manoharan, A., *Digital governance in municipalities worldwide (2011-12),* National Centre for Public Performance, Newark, 2012., pp. 81 – 89.

16 Russon Gilman, H.; Carneiro Peixoto, T., *Digital Participation*, in: Elstub, S.; Escobar, O, (eds.), Handbook of Democratic Innovation and Governance, Edward Elgar Publishing, Cheltenham, 2019., pp. 105 – 119.

of the community member. E-democracy by default assures an open digital approach to all community citizens, with the possibility to express their opinions and suggest solutions for social, economic, political and organizational problems at local or national level.[17] The virtual network established by digital tools enables interaction and communication between different members of the community, and contributes to the openness of national and local public authorities. The digital playground assures the possibility of the inclusion of various participants in virtual space, with their ideas and propositions of political solutions in the social, economic and political life of the local and national community.[18] On the other hand, formal ways of digital democracy include the possibility of legal organization of electronic elections, plebiscite and referendum. They are formal in the legal sense because of the necessary creation of a regulatory framework for implementation and formal application democratic political processes in political and public authorities and institutions.[19]

Elements of smart digital application in public administration can be divided on main categories of users: *government authorities to government authorities, government authorities to citizens, government authorities to business and corporative entities, and government authorities to non-governmental organizations*.[20] Smart digitalization includes horizontal and vertical integration of e-government services. Vertical integration of smart digitalization includes connection of national e-government services with local e-government services. Horizontal integration of e-government services includes integrative approach by using e-government services at the same level of communication, with intensive mutual communication between different parts of the communication network. Vertical integration usually has some type of integrative communication with horizontal integration, which includes communication different level of the government authorities and central and local administrative bodies and public institutions, but also interconnection between all parts of public institution at the same level incorporated in smart digital network. The main element of smart digitalization of public administration is more efficiency and effectiveness in providing ~~of~~ public services and delivering goods. The digital

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17 Stier, S., *Political determinants of e-government performance revisited: Comparing democracies and autocracies*, Government Information Quarterly, Vol. 32, Issue 3, 2015, pp. 270 – 278.

18 Aström, J. *et al., Understanding the rise of e-participation in non-democracies: Domestic and international factors*, Government Information Quarterly, Vol. 29, Issue 2, 2012, pp. 142 – 150.

19 Ju, J.; Liu, L.; Feng, Y., *Public and private value in citizen participation in E-governance: Evidence from a government-sponsored green commuting platform*, Government Information Quarterly, Vol. 36, Issue 4, 2019, [https://doi.org/10.1016/j.giq.2019.101400].

20 Bindu, N.; Sankar, C. P.; Kumar, K. S., *From conventional governance to e-democracy: Tracing the evolution of e-governance research trends using network analysis tools*, Government Information Quarterly, Vol. 36, Issue 3, 2019, pp. 385 – 399.

platform for public administration needs to be organized with unique access to all services. That contributes to establishing a new paradigm in the implementation of digital public services: public administration in cyberspace.[21]

The implementation of digital technologies improves cross communication between different parts of government authorities, administrative bodies and public institutions, and assures unique access to different public services.[22] Smart digitalization is designed to connect and unify access to various parts of government services, which includes services and goods delivered from central government authorities, but also services from local government authorities usually called smart city services. The combination of local and central e-government services connected in a single platform assures wide access in the use of different public services from central and local government authorities. That facilitates the use and increasing quality of local and central government public services, which is the intention of an integrative approach in implementation of smart digitalization.[23]

According to the main categories of users, smart digitalization has some specific elements important for implementation in the daily functioning of public authorities and governmental bodies. These elements depend on interaction between different types of users in digital space and their specific needs.[24] They are interconnection, common access, development of a unique digital platform for central and local government services, simplified digital access and smart digital service.

A category government authority to government authorities is focused on intergovernmental communications and cooperation between different parts of public authorities and public institutions. This cooperation is important because of rising efficiency in public administration and better working performances of public institutions. Prerequisites for application are unique digital platform with common access, compatible applications and possibility of data sharing between different databases. Main problem is possibility of data access for different category of government users because of legal restrictions. Main advantage is better control over public spends and preventing of various misuse from the users. Additional advan-

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21 Frissen, P. H. A., *Public Administration in Cyberspace*, in: Snellen, I. T.M.; Van de Donk, W.B.H.J., Public Administration in an Information Age, IOS Press, Amsterdam, 1998, pp. 33 – 46.

22 Addo, A.; Senyo, P. K., *Advancing E-governance for development: Digital identification and its link to socioeconomic inclusion,* Government Information Quarterly, Vol 38, Issue 2, 2021, [https://doi.org/10.1016/j.giq.2021.101568].

23 Caragliu, A.; Del Bo, C.; Nijkamp, P., *Smart Cities in Europe, Journal of Urban Technology*, Vol. 18, Issue 2, 2011, pp. 65 – 82.

24 Verma, S., *Sentiment analysis of public services for smart society: Literature review and future research directions,* Government Information Quarterly, Vol 39, No 3, 2022, [https://doi.org/10.1016/j.giq.2022.101708].

tage lay down in possibility of common data disposal, which enables faster, better and efficient decision making process.

A category government authority to citizens is focused on interaction between citizens, administrative bodies and public authorities. This category regulates the provision of various public services at local and central government level. For the delivery of goods and services from public authorities and public institutions it is important to define a common digital platform for their application and the possibility of horizontal and vertical integration in the delivery of all public services with common access to all applications. That includes easier access in the possibility of using services from central and local government authorities. A common public services platform contributes to standardization of government services and interaction between citizens and public authorities.

A category government authority to business and corporative entities defines the delivery of public services and interaction with economic subjects in economic activities in order to support economic development of society. For development, this type of smart digitalization it is necessary to develop various programs and activities such as one stop shops, virtual marketplaces etc. An important part in developing this category is access to various e-services such as e-taxation, e-customs etc., which provides possibility to developing business in real time at the virtual space.[25]

Category government to non-governmental organizations is focused on developing e-services for interaction between organizations of civil society and public institutions. This is important for the development of a social framework to support political, cultural, educational and social activity in society. This type of public service digitalization also assures support development of various e-government programs and digital services connected in a common e-democracy digital platform. Due to this category, an e-democracy and e-administration service assures unique access to various central and local government political and administrative services. A special aspect of this category is the possibility of monitoring, supervision and control of functioning and activity of public authorities and governmental institutions from civil sector institutions and non-government organizations. This type of controlling and supervision can be implemented in virtual public space, which assures widely visibility of public sector organizations and institutions in their daily activities in society.

The provision of digital public services depends on the institutional capacity of central and local government authorities, and their preparedness to modernize the

[25] Awan, M. A., *Dubai e-Government: An Evaluation of G2B Websites*, Journal of Internet Commerce, Vol 6, Issue 3, 2007, pp 115. – 129.

functioning of political and administrative institutions.[26] Central government institutions develop digital services important for all citizens in society. Elements of central e-government services have a global impact, no matter where citizens live. Their effects are applicable to all of society. Local government institutions are more focused on strengthening digital services important for local communities.[27] Their effects are focused on local public needs and they are oriented on the delivery of goods and services provided by local government bodies and institutions. In the local community, the possibility of providing digital services depends on the institutional capacities of local government units. If they have large institutional capacity, because of broadly fiscal, administrative, and political autonomy, they can implement various local digital services for the coordination of local public tasks and activities. Local digital services are oriented to ensure easier possibility of citizen's participation in social, political and economic life of local government units.[28]

The second element of local digital services is oriented on digitalized forms of citizens' political participation in the local community, which is connected with citizens' voluntary engagement in local public affairs.[29] This is an important part of local public services digitalization, which includes citizens' participation in activities of sub-municipal government, as a specific part of local government. Sub-municipal government includes participation of citizens in local public affairs and tasks closely connected with the daily life of citizens in the local community. This participation has a voluntary character and depends on the position of sub-municipal government in the organization of local government units. Participation of citizens in local public affairs includes two types of engagement: support to local public authorities and local institutions in providing local public services and direct participation through voluntarily engagement in managing and maintaining local public tasks. Because of the voluntary engagement, the local community in sub-municipal government units needs effective logistic support in the coordination of social, cultural and politic activity. Digitalization of sub-municipal government activities provides efficient participation of citizens in the local community, and their coordination with activities of local government units, with less organizational, personal and financial engagement of local government administration and more

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[26] Atkinson, R. D.; Leigh, A., *Customer-Oriented E-Government,* Journal of Political Marketing, Vol. 2, Issue 3 – 4, 2003., pp 159 – 181.

[27] Ruano de la Fuente, J., M., *E-Government Strategies in Spanish Local Governments*, Local Government Studies, Vol 40, Issue 4, 2014, pp. 600 – 620.

[28] Albino, V.; Bernardi, U.; Dangelico, R., M., *Smart Cities: Definitions, Dimensions, Performance, and Initiatives,* Journal of Urban Technology, Vol 22, Issue 1, 2015, pp. 3 – 21.

[29] Viale Pereira, G., *et al., Increasing collaboration and participation in Smart City governance: a cross-case analysis of Smart City initiatives*, Information Technology for Development, Vol. 23, Issue 3, 2017, pp. 526 – 553.

influence in public affairs and local government services in sub-municipal units. Smart digitalization of sub-municipal government usually includes an integrative political and administrative approach, because of the many local tasks which are organized on a voluntary basis and capacity of the citizens in the local community to directly influence their organization and performance conditions. Smart digitalization of sub-municipal activities and their regulation in virtual space assures the possibility of the citizens to directly participate in the provision of sub-municipal services and propose solutions for their improvement. Importance of implemented solutions of smart digitalization in sub-municipal government depends on organizational positions and the role of sub-municipal units in the organization of the local government system. If sub-municipal government plays a significant role in the type of local government system, then implementation of smart digitalization is generally more important for the local community, and its integration in other local government activities. In other situations, where position of sub-municipal government is not so significant, smart digitalization of sub-municipal government can be more important for the coordination of local public activities in those type of units, without integration in the wider system of local self-government.[30]

The implementation of smart digitalization in local government units depends on elements important for building a Smart City platform. These elements are values, innovation, governance, finances, information management, connectivity and accessibility and local infrastructure.[31] On the other hand, smart digitalization of central government administration and national public services, besides these elements characteristic for local level of government organization, also includes an integrative approach and global impact on all economic and social activities in society.[32]An integrative approach includes general connection all digital public services with horizontal and vertical integration of services providing. Global impact to all economic and social activities defines the influence of smart digitalization on all aspects of public activity in the community.[33]

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30 Komninos, N., *et al., Smart City Planning from an Evolutionary Perspective*, Journal of Urban Technology, Vol. 26, Issue 2, 2019., pp. 3 – 20.

31 Klarić, M., *Smart City Model as a Possible Answer to New Challenges in Post Covid Era*, in: Duić, D.; Petrašević, T. (eds.), The recovery of the EU and strengthening the ability to respond to new challenges – legal and economic aspects, EU and Comparative Law Issues and Challenges Series, ECLIC 6, pp. 527 – 546.

32 Buffat, A., *Street-Level Bureaucracy and E-Government,* Public Management Review, Vol. 17, Issue 1, 2015, pp. 149 – 161.

33 Wyld, D. C., *The 3Ps. The Essential Elements of a Definition of E-Government*, Journal of E-Government, Vol. 1, Issue 1, 2004, pp. 17 – 22.

3.2. Smart digitalization and public services

Public services represent an important part in the activity of central and local government authorities. It can be divided into a narrower and broader sense. In a narrower sense, public services represent services of general interest, which can be divided into commercial or non-commercial services. Commercial services include services of general economic interests, which can be divided into central and local services, according to the level of their managing and organizing. Non-commercial services include services of general interests, organized by non-profit principles with the purpose of fulfilling public needs in the social community at local, regional or national level. In a broader sense, public services include all administrative services organized and managed by central or local government or public authorities. This includes services from central and local government administration, national public utilities, public institutions (such as hospitals, museums, schools, etc.) and local communal utilities and institutions. For the purpose of this paper, a broader term of public service will be used.

Smart digitalization includes connectivity between various e-government services with the purpose of assuring the possibility of using public services in virtual space.[34] Various aspects of smart digitalization of public services are connectivity, efficiency, simplicity, innovation and better governance. Connectivity as the element of smart digitalization assures interaction between different public services at local and central government level, with horizontal and vertical cooperation between public authorities and institutions. That ensures supervision over the functioning of different parts of public administration and prevents abuse in the use of public services or access to benefits from public institutions.[35] In that sense, connectivity assures visibility, transparency and control of digital public services.

The second aspect is efficiency, which is provided by unique digital platform, common access and interconnection between different digital services. The possibility of using public services increases with their digitalization and availability in digital space, which enables greater and easier access to services, which is additionally supported by the implementation of smart digital solutions, including artificial intelligence. Simplicity is the third element, which can be assured by the implementation of new digital platforms with unique and relatively easier access to various central and local government services. Simplicity is the important part of smart digitalization. Without simplicity, public services cannot be accessed by a

[34] Menash, I. C., *Impact of Government Capacity and E-Government Performance on the Adoption of E-Government Services*, International Journal of Public Administration, Vol. 43, Issue 4, 2020, pp. 303. – 311.

[35] Ingrams, A., *et al., Stages and Determinants of E-Government Development: A Twelve-Year Longitudinal Study of Global Cities,* International Public Management Journal, Vol 23, Issue 6, 2020, pp. 731 – 769.

large number of people who do not have specific knowledge of advanced communication and information technologies. Simplicity supports the implementation of digital technologies and communication between different parts of public services in virtual space. Innovation is connected with simplicity, and assures direct implementation of new technological solutions such as artificial intelligence as a new dimension of smart digitalization. Better governance is the basic part in the implementation of smart digitalization. Good governance is the modern administrative doctrine, developed to harmonize administrative reforms with democracy processes and decentralization. In that sense, better governance unifies various aspects of smart digitalization, with the purpose of assuring new standards in the functioning of administrative and political institutions. That opens up a new dimension in the behavior of public institutions, where better governance assures direct virtual participation of the citizens in political and administrative processes, active political, administrative and normative control over digital public services and the possibility of revision, including adoption of new digital technologies. For the first time, citizens can have active control over managing public services, and insist on advanced technological solutions, including smart digitalization and the implementation of artificial intelligence technologies.[36]

3.3. Implementation of artificial intelligence in the smart digitalization process

Artificial intelligence (AI)is an important part in developing digital technologies in contemporary society. It represents new step in the process of smart digitalization, including smart digitalization of public services. Other aspects of smart digitalization are primary focused on interconnection, the possibility of different digital services integration and digital participation in political and administrative processes via true access on virtual space.AI assures the implementation of smart digital services with autonomy in decision making process, as a result of so called deep learning technology, which is ground level for the development and implementation of various AI applications.[37] Deep learning assures the integration of data feature extraction and classification, which is different from classic machine learning, which includes data input, feature extraction and data classification. By definition, deep learning creates postulations for implementation decisions based

[36] Irani. Z., *et al., The impact of legacy systems on digital transformation in European public administration: Lesson learned from a multi case analysis*, Government Information Quarterly, Vol. 40, Issue 1., 2023, [https://doi.org/10.1016/j.giq.2022.101784].

[37] Sharma, M., *et al., Implementing challenges of artificial intelligence: Evidence from public manufacturing sector of an emerging economy*, Government Information Quarterly, Vol. 39, Issue 4, 2022., [https://doi.org/10.1016/j.giq.2021.101624].

on data analysis with better possibility of prediction of future happenings, according to interactive and dynamic communication with the data environment, by using structured data according to specific machine algorithm. Deep learning assures the AI the possibility of self-learning and specialization in different fields of knowledge, truly better interaction and implementation of logarithm programs by using modern tools such as neuronal networks, which efficiency depend on processor strength of modern computer networks. The main standards of AI implementation with potential abuse are still open questions in Europe and worldwide. Special problems are control tools and mechanisms, which can provide prevention of AI abuse, according to the defined standards of risks.[38]

Artificial intelligence (AI) is a widely open question in the regulation of European public authorities because of specific elements without a clear answer. In that sense, regulation of artificial service is the next step in the process of transformation of public services. The main aspects of this transition in the development of smart digitalization are ethical questions arising from new technological solutions. Ethical issues are usually connected with administrative decisions, which are the product of political decisions. Those decisions, which are results of human behavior, became part of AI functioning with potentially far-reaching consequences.[39]The European Parliament holds discussion on the influences of AI over digital public services. At the same time, the European Commission proposed to the European Parliament and the European Council enactment of Artificial Intelligence Act, as a general legal framework for regulation of artificial intelligence in Europe. Currently, proposal of the Act is in legal procedure from 2021.[40]

The proposition of the Artificial Intelligence Act contents regulation of different fields of risk, which can be generally divided into unacceptable risk applications, high-risk applications and low-risk applications. The main problem is in defining what contains every type of risk in AI applications.[41] It is obvious that some application represents unacceptable risk because of the possibility of manipulation. Some of the AI applicative solutions show significant potential for manipulation with reality in virtual

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38 Wilson, C., *Public engagement and AI: A values analysis of national strategies*, Government Information Quarterly, Vol. 39, Issue 1., 2022, https://doi.org/10.1016/j.giq.2021.101652].

39 Meszaros, J.; Minari, J.; Huys, I., *The future regulation of artificial intelligence systems in health careservices and medical research in the European Union*, Frontiers in Genetics, Vol. 13, 2022. [https://doi.org/10.3389/fgene.2022.927721].

40 See: Proposal for a Regulation of the European Parliament and of the Council laying down harmonised rules on artificial intelligence (Artificial Intelligence Act) and amending certain union legislative acts, COM (2021) 206, [https://eur-lex.europa.eu/legal-content/EN/HIS/?uri=COM:2021:206:FING], Accessed 05.04 2023.

41 Carrico, G., *The EU and artificial intelligence: A human-centered perspective*, European View, Vol. 17, Issue 1, 2018, pp. 29 – 36.

space, and there are no appropriate tools for measuring or controlling the possibility of damage. The capability of AI applications is widely mentioned, and the risks of implementation are not yet clearly defined and determined.[42]That is the reason why this Proposal is part of broader social discussions, not only in EU member states and EU institutions, but also wider, in counties which are influenced by European administrative and political space.[43]An additional element to this discussion is for the first time this type of innovation managed from the private providers which operate globally and potentially without of political or ethical control. Discussion is still focused on technical aspects of AI, and political, ethical and economic consequences of the application for contemporary society are still a secondary question. Institutions and public authorities of the EU and member states are leading in opening up these questions, and represent the direction for future development and implementation of this type of smart digitalization. It is especially important in the implementation of public services digitalization, because of political and democratic components of services in virtual space. This reasoning is especially applicable to the manipulation of virtual reality which is very difficult to detect, unlike the social reality without virtual networks. It bears witness to the transition of social reality into social virtual reality, which under conditions of smart digitalization can be very manipulative for decisions of the individuals in community. A special problem is potential manipulation of human rights and individual freedoms, in situations where the implementation of AI represents one of the key elements in smart digitalization of the public services.[44]

There are three main standards of risks of AI application in daily use. The first standard of AI risks daily application is usually determined as unacceptable risk, where application can distort, change and manipulate with social realty in virtual space. This type of application is dangerous because it leads to misconceptions in virtual space, which affects to the behavior of individuals and the decisions they make. As results of misconceptions and distorted perception of reality, decisions of individuals are illogical. This is unacceptable, because the possibility of manipulating people by using digital services in virtual space is enormous. The main question is how to certainly define clear conditions which are precisely unacceptable

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42 Wirtz, B. W.; Weyerer, J. C.; Kehl, I., *Governance of artificial intelligence: A risk and guideline-based integrative framework,* Government Information Quarterly, Vol. 39, Issue 4, 2022, [https://doi.org/10.1016/j.giq.2022.101685].

43 Alujevic-Vesnic, L.; Nascimento, S.; Pólvora, A., *Societal and ethical impacts of artificial intelligence: Critical notes on European policy frameworks*, Telecommunications Policy, Vol. 44, Issue 6, 2020., [https://doi.org/10.1016/j.telpol.2020.101961].

44 Dijk, van N.; Casiragi, S.; Gutwirth, S., *The 'Ethification' of ICT Governance. Artificial Intelligence and Data Protection in the European Union,* Computer Law & Security Review, Vol. 43, 2021, [https://doi.org/10.1016/j.clsr.2021.105597].

risks of AI application, because of the possibility of prohibition of this type of AI platforms and program solutions.

The second standard of AI risk application is high risk application, where significant possibility of manipulation in virtual space exists. The possibility of manipulation includes a type of AI application which can distort information in virtual space and manipulate with users' decisions, according to the requests set in application programs. This can be very problematic in many ways, because it implicitly influences users' reactions and decision making process, which is not based on objective facts and circumstances. This type of AI implementation can be defined as manipulative and it can be potentially dangerous for the users and their ability to make reasonable decisions.

The third standard of AI risk is defined as low-risk, which means that this type of implementation of artificial intelligence does not creates significant risk for the users. Implementation of this smart digitalization model, risk standards can be showed, but the possibility for manipulation and abuse is relatively low, which makes the possibility of using low risk AI application much easier. The main element for delimitation between high or low risk AI applications is the possibility of distortion of virtual reality and complexity of elements in the decision making process based on using of AI application. These parameters are not yet clearly defined, and public discussion on this problem remains open in European institutions. The main problem is in the possibility of some forms of AI under low-risk definition to be used in situations where it can be in a high-risk position for the users. Other problems are limits of the risks in using of AI application dependently under various conditions, which define the possibility of smart digitalization implementation in various aspects of social or economic activity. It will be necessary to create appropriate tools which can lead standards of risks, and assure security in using AI application. The problem is in new implementation of AI technologies, where it is very hard to define elements of protection against AI implementation abuse in context smart digitalization.[45]

The Proposition of the EU Artificial Intelligence Act could become the global standard in Europe (and abroad), which would determine on what implementation and extent of artificial intelligence is more or less accepted or non-accepted in daily life and which application can have more positive than negative effect to users.[46] Another aspect of this Proposal is connected with the issue of personal and

[45] Palladino, N., *The role of epistemic communities in the "constitutionalization" of internet governance: The example of the European Commission High-Level Expert Group on Artificial Intelligence*, Telecommunications Policy, Vol. 45, Issue 6, 2021, [https://doi.org/10.1016/j.telpol.2021.102149].

[46] Stahl, B. C., *et al., A European Agency for Artificial Intelligence: Protecting fundamental rights and ethical values*, Vol. 45, 2022, [https://doi.org/10.1016/j.clsr.2022.105661].

societal consequences, which will be caused with implementation. To assure security in use of AI, the Proposal prohibited AI practices to the group of individuals who are vulnerable due to their social or economic situation.[47]

The second aspect, which is important in the context of this proposal, is the question of personal and societal harm, which will arise true implementation of this Act. To reduce potentially harm (individual as societal) proposal of Artificial Intelligence Act prohibited AI practices to groups of individuals who are vulnerable according to their social or economic situation. The second important thing is classification of AI risks with clear definition that divides high risk situations in AI implementation from low risk situations. An additional question is the general purpose of AI systems, where the Act proposal specifies certain situation where the principles of high-risk AI system are implemented on the design of AI system which can be used for many different purposes (general purpose AI). The important part of AI Act proposal is implementation of the transparency principle according to the implementation, development and use of high-risk AI. New added provisions have provided obligation for users of AI emotion recognition system to inform people when they are exposed to the influence of the system.

3.4 Artificial intelligence in the public services as a part of smart digitalization

Artificial intelligence represents a logical step in the development of smart digitalization public service. It can assure better communication between citizens and public authorities, faster and more available public services, better quality in providing service and easier control over delivering various public services.[48]Smart digitalization was a step further in the process of digitalization at local and central government level, because of the integrative platform and interconnection between central and local public services. The implementation of AI can assure possibilies for better interaction of users with digital public services, and the most important characteristics such as ability of learning and possibility of correcting various decisions, according to new occasions and circumstances.[49] The implementation of AI in digital public services needs to assure an interactive approach

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47 Kop, M., *EU Artificial Intelligence Act: The European Approach to AI*, [https://law.stanford.edu/publications/euartificial-intelligence-act-the-european-approach-to-ai/], Accessed 5 April 2023.

48 Gesk, T. S.; Leyer, M., *Artificial intelligence in public services: When and why citizens accept its usage*, Government Information Quarterly, Vol. 39, Issue 3, 2022., [https://doi.org/10.1016/j.giq.2022.101704].

49 Noordt, C.; Misuraca, G., *Artificial intelligence for the public sector: results of landscaping the use of AI in government across the European Union,* Government Information Quarterly, Vol. 39, Issue 3, 2022., [https://doi.org/10.1016/j.giq.2022.101714].

in communication between users and digital platform, flexibility in access of digital services, better coordination between central and local government services, significant control over public services delivery and possibility of real-time self-improvement services.[50]

Categories of AI implementation can be divided into central, regional and local service application, according to the specific conditions characterized for different levels of administrative organization. The second division of AI implementation can follow categories of the risk, according to the approach of EU institutions. The third division of public services can be selected on political and administrative services. Political services are more focused on supporting political processes of the government authorities, like participation of the citizens in election or political decision making process, such as new regulations, spatial plans in local or regional government units, plebiscite, referendum or discussion on public spends, or other local, regional or national political matters. Administrative are more focused on public services providing from public authorities and institutions to fulfill public needs or assure functioning of government institutions. Crucial questions which AI opens up by implementation in the daily functioning of public services are: the question of data protection of users, the question of clearly identification of the users which includes protection of potentially abuse, question of virtual reality distortion and manipulation with the data including disinformation, question of mass collecting, saving and memorizing of the data without adequate control of the users and government authorities and question of the protection of minors according to their stages of development and consciousness.

All of these questions define a regulatory framework for the development of appropriate tools for the implementation of AI as a further part in development of smart digitalization of public services. In that sense, it is important truly open up public discussion to try to connect main elements of future EU regulation of AI application in daily use with specific elements characteristically for public services digitalization.[51] These elements usually are openness, transparency, personal data protection, simplicity, common access, interconnection between services, responsiveness and the ability to provide complex answers or alternative solutions to the users depending on circumstances, what is usually define as contingency. Implementation of AI solutions in digital public services presents future development of smart digitalization and it would be an integral part of green transformation of

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50 Janssen, M., *et al., Data governance: Organizing data for trustworthy Artificial Intelligence*, Government Information Quarterly, Vol. 37, Issue 3, 2020., [https://doi.org/10.1016/j.giq.2020.101493].

51 Hildebrandt, M., *The Artificial Intelligence of European Union Law*, German Law Journal, Vol. 28. Issue 1, 2020, pp. 74 – 79.

EU society, according to the imperative of sustainable development. This leads to development of a new framework, which includes legal, ethical, sociological and psychological elements important for the implementation of various AI solutions, to protect users and prevent the possibility of potential abuse. This is important in the implementation of AI in all aspects of social life of citizens, and especially important in functioning of public services because of additional political dimension, which includes the problem of personal data protection, possibility of human or political rights manipulation and other questions connected with the protection of citizens' rights, including question such as election, political participation, possibility of political discussion, or just protection of human dignity.[52]

4. DISCUSSION

Smart digitalization of public services is one of the contemporary questions arising as a result of increased development of information and communication technologies in modern society. The digitalization of public services came with the initiation of the first models of e-government and development of digital technologies being one of the main initiators of social and political development. On the other hand, it can be also new challenge, because of the social and political effects caused with the ability of people to achieve and use modern digital technologies in daily communication, which is described as *the digital divide caused by digital access*.[53] Smart digitalization is an attempt to support sustainable development of society. Smart digitalization of public services is a specific part of this process, which includes additional elements important in democratic institutions such as openness in acting, transparency in delivering public services, personal data protection and mutual access to various public services, an integrative approach in delivering public services and protection of political and human rights.

With the introduction of AI as a further phase of smart digitalization of public services, implementation of digital technologies in political and administrative system brings new challenges which will be need to clearly defined, according to their potential influence. These open up many questions and the answers are not specified. European institutions discuss AI trying to define its implementation and use in various services delivery. At the same time, the development of AI pro-

[52] Erdélyi, O. J.; Goldsmith, J., *Regulating artificial intelligence: Proposal for a global solution*, Government Information Quarterly, Vol. 39, Issue 4, 2022., [https://doi.org/10.1016/j.giq.2022.101748].

[53] See Van Dijk, J. A. G. M.,*Digital Divide: Impact of Access*, The International Encyclopedia of Media Effects [https://www.utwente.nl/en/bms/vandijk/publications/digital_divide_impact_access.pdf], Accessed 4 July 2023, pp. 1 – 11.

grams and applications accelerating and requires clear social, ethical and legal rules that guide this development.

In the future, the development of smart digitalization of public services in three different directions can be expected: smart digitalization of political tools such as e-election, e-discussion, e-referendum, e- citizen participation; smart digitalization of administrative tools such as e-taxation, one stop shops, e-health, e-education, etc.; smart digitalization of local government tools, which is usually described as smart city concept, with integrated local digital services. Accordingly, significant influence of AI applications on digital public services can be also predicted. The main issues in the process of AI implementation which need to be discussed are: *personal data protection, protection of data distortion, protection of data manipulation and general protection of human and political rights against manipulation and abuse by using of AI program solutions*. Personal data protection is one of the most important questions posed with the development of digital technologies, which enables collecting and using large amounts of data. These data which can be connected with some person, and there is the possibility of manipulation or abuse of virtual reality which is used for manipulation of digital services, especially in the situation of AI data processing, where the assessment of some action depends on the valuation of the present situation from AI program solutions.

The second aspect is data distortion, where AI programs do not process and connect data in a neutral and objective way. General protection of human and political rights is real in situations where AI program solutions do not support or do not reflect legal and democratic standards in the implementation of smart digital solutions in the development of digital public services. In the development of AI application, it can be a problem, because AI platforms or program solutions can be, in technical dimensions, built as neutral technical settlement, and ethical, psychological, social, economic or political elements of AI development depends on democratic political standards in society. As a single European market, based on convergence of the similar values of connected member states, the EU needs to establish and develop standards for the implementation of smart digital platforms and applications, including the implementation of AI application. The main elements of EU regulations in the field of smart digitalization services and implementation of the green technologies need to be openness and transparency, friendly access and use by various users in virtual space, protection from manipulation and abuse and a high level of security. Additional conditions for the smart digitalization of public services are equal accessibility to the public services provided at local, regional or national level and possibility of mutual interaction with different levels of government authorities, which depends on effective application

of AI solutions, based on developing standards common for the European regulatory framework.

5. CONCLUSION

Smart digitalization is a new way for improving delivery of services and goods in a single European market. It usually comes with requests for green transformation of the EU economy. This is a further step in the process of the digitalization of society, and it has political, economic and social implications. The development of smart digitalization becomes an oriented application of smart digital solutions in two main directions.

Firstly, the improvement of public services at local level (known as a concept of smart cities) and assuring the participation of citizens in the local community by developing local virtual space, which contributes to dialogue between different local actors, such as citizens, local institution, political organizations, etc.

Secondly, the implementation of e-government models at national level, which includes the development of e-democracy services for the implementation of democratic political tools and e-administration services for providing various public services and delivering public goods, contributes to the development of common national digital platforms, which connects and unifies local and national digital services. An additional step in the development of smart digitalization is the implementation of AI technologies, application of which has been accelerated according to the further development of information and communication solutions. The development of digital public services is an integral part of the smart digitalization process, and the possibility to implement AI technology opens up many options in using public services and interactive communication with public institutions.

On the other hand, development of AI technology is relatively fast, and consequences and negative aspects of AI usage are relatively unknown. The influence of AI technology implementation is the subject of public discussions with different definitions and opposing stands. These circumstances open up many questions about creating an efficient framework for using AI with regard to legal, economic, political and social consequences in the community.

The future development of smart digitalization as a part of green transformation of the EU economy is a complex process with many challenges. Future perspectives and dynamics depends on the further development of information and communication technologies which will be based on the implementation of AI applications and the possibility of regulating these new technologies and their influence on the

social, economic and political life of the community. These developments can accompany true implementation in local, regional or central government level, and includes interaction between government authorities and cooperation in services provided between the public and private sector. Efficiency of smart digital implementation depends on future use of AI technologies, which is an important issue for the preparedness of public authorities and public institutions to be a support for the green transition of European society and sustainable development. On the other hand, implementation of AI technologies will radically change approaches in using various digital services and interaction between users and providers, including the ability of public authorities to provide various public services, according to the newly defined standards of the green transition of modern society in the EU community.

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