MARKETING AND MANAGEMENT OF INNOVATIONS IN PUBLIC GOVERNANCE AS CORE DETERMINANTS OF TRUST

Abstract. Public governance significantly transformed over the last several decades that is determined by numerous external and internal factors. Digitalization of social and economic relations results in the appearance and implementation of a new kind of innovation in public management – e-governance. Therefore, developing the marketing and management strategy of such innovation as e-governance is considered a necessary precondition for trust in government. The paper aims to determine the impact of e-governance on trust in government and the development of recommendations on marketing and management of it. In the paper, the authors systematized main national and foreign approaches to measuring e-governance efficiency both at the level of central and sub-central governments. It is also realized a bibliometric analysis with VOSviewer v.1.6.16 to identify key contextual directions of scientific research on e-governance, marketing, and management and clarify its intercrops. The paper has developed a scientific hypothesis about the positive influence of e-governance on central and sub-central government brands and citizens’ loyalty. To test this hypothesis, a panel data regression analysis was realized using Stata 12/SE software. In the regression model as a proxy of e-governance efficiency (independent variable), an E-Government Development Index (EGDI) is chosen, which is a composite indicator of three indices such as online service index, telecommunication index, and human capital index. It is chosen as a proxy central and sub-central government brand and citizens’ loyalty (dependent variable), an indicator of Trust in Government that is calculated by the Organisation for Economic Co-operation and Development (OECD) and refers to the share of people who report having confidence in the national government. Besides, the regression model includes a sample of control variables such as Worldwide Governance Indicators. The country sample consists of 19 OECD member states (European countries): Austria, Belgium, Czech Republic, Denmark, Finland, France, Greece, Hungary, Italy, The Netherlands, Poland, Portugal, Slovak Republic, Sweden, Great Britain, Estonia, Latvia, Lithuania, and Slovenia. 2008-2020 (specifically, 2008, 2010, 2012, 2014, 2016, 2018, 2020). Under the bibliometric and regression analysis results, a set of practical recommendations on the perspectives of central and sub-central governments’ marketing and management of e-governance.

Keywords: marketing, management, innovation, e-governance, trust in government, panel data analysis.

Introduction. At present, the loyalty of central and sub-central governments loyalty depends on not excluding the efficiency of policy they realize in different spheres and their openness, feasibility, and accountability. Namely, effective brand management as an element of successful marketing strategy becomes very crucial nowadays. The background of such a conclusion assumes that the positive image

Cite as: Vysochyna, A., Semenov, V., & Kyrychenko, K. (2021). Marketing and Management of Innovations in Public Governance as Core Determinants of Trust. Marketing and Management of Innovations, 2, 204-212. http://doi.org/10.21272/mmi.2021.2-17

https://doi.org/10.21272/mmi.2021.2-17
of the government body and its willingness to cooperate with business entities and citizens as its main «clients» and openness to communication with them should develop «clients» loyalty and trust to such a government. Otherwise, the absence of transparency in their relations might even eliminate positive effects from successfully realized government projects and initiatives. It might be noted that modern information technologies cover almost all spheres of human life, such as business, education, social protection, health care, public administration, ecology, etc. Most developed countries are already operating in the new dimensions of digital society and economy, introducing a new kind of innovation in public management such as e-government, creating government portals, launching electronic digital signatures, ID and MobileID cards, establishing interaction between public authorities and citizens, and most importantly – reducing the number of bureaucratic procedures that lead to improvement of the quality and efficiency of the state authorities, and boost an increase of loyalty to central and sub-central governments. Therefore, the feasibility, openness, and accountability of executive bodies via the e-governance approach are becoming a new pillar of marketing and management strategies of government authorities. Based on the above, in the conditions of rapid digitalization of various spheres of life and changes in the worldview of citizens to the virtual environment, the need for the introduction of e-government as an innovative element of public management is growing.

**Literature Review.** Analysis of publications on the role of e-governance as an element of innovation in public management of central and sub-central governments’ allows pointing out main national and foreign approaches to measuring e-governance efficiency both at the level of central and sub-central governments.

Firstly, it should be noted that «e-government refers to the use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that could transform relations with citizens, businesses, and other arms of government. These technologies could serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management» (World Bank, 2021). E-government is based on a human centrist approach, which involves building a model of innovative interaction between public authorities and citizens or business representatives by focusing on their interests and needs. Specialists of the Basel Institute of Governance have systematized the main tools for the introduction of e-government (Basel Institute, 2019) as follows: E-Communication with Government; E-Customs; E-Filing of Taxes/E-Taxes; E-Invoicing; E-Licensing; E-Platform; E-Procurement; E-Residency; E-Sourcing; E-Tendering; Single Window Services (SWS); Trade Facilitation Services (TFS). In the early stages of development, e-government initiatives were aimed at automating processes in the public sector and streamlining both within the state structure and between government organizations. Still, the focus is increasingly shifting to uninterrupted information flows and promoting joint decision-making (Mujtaba et al., 2018).

Thus, the development of e-government at the state and local levels would allow:

- improve the quality of services provided by state executive bodies and local self-government;
- provide to citizens access to the public information about the activities of public authorities and state enterprises, and the ability to use this information to monitor the effectiveness of public funds redistribution;
- reduce administrative costs;
- increase the probability of detecting violations in the public sector;
- minimize the level of corruption risk, etc.

In conclusion, the above effects together would increase the transparency of public administration and eliminate conflicts of interest between public administration institutions and individuals and legal entities. E-government has become relevant in various countries around the world only in the last decade. Therefore, there is no wide range of research on the impact of e-government on the dynamics of socio-
economic relations in the country.

Thus, based on the analysis of 141 countries during 1984-2009, Elgin and Oztunali (2014) found that the institutional environment's level of development closely correlates with the rate of economic growth and the size of the shadow economy. Bhandari (2019) also mentioned that the quality of institutional architecture is a precondition for a country's sustainable development.

Molotok (2020) analyzed approaches to budget transparency measures and their impact on central and sub-central governments' performance. Dove et al. (2020) also argue that transparency becomes a way of attaining quality, safety, and optimal food purchases.

Brimah et al. (2020) pointed out that knowledge management plays an essential role in state and corporate productivity. Moreover, transparent and accountable managerial approaches positively impact central and sub-central government and corporate performance (Kuznyetsova & Klishchuk, 2017; Di Tommaso and Gulinelli, 2019; Nur-Al-Ahad et al., 2019; Kuznyetsova et al., 2019; Elhennawy, 2019; Agnihotri and Gupta, 2019).

Methodology and research methods. This research aimed to determine the impact of e-governance on trust in government and develop recommendations on marketing and management. It was proposed to realize two blocks of analysis (bibliometric and regression) for completing this task (based on panel data). In turn, the bibliometric analysis would be realized with VOSviewer v.1.6.16 based on the most cited publications in the Scopus database focused on marketing and management perspectives of the e-governance concept. Under the empirical book of the research, a scientific hypothesis about the positive influence of e-governance on central and sub-central government brands and citizens' loyalty is developed. For testing this hypotheses, a panel data regression analysis was realized using Stata 12/SE software. For quantifying the level of e-governance, the E-Government Development Index (EGDI) was chosen. Notably, it is calculated once in two years by experts from the United Nations Department of Economic and Social Affairs. E-Government Development Index is a composite indicator that consists of three elements: online service index, telecommunication index, and human capital index, which are normalized and weighted in the integral index. The EGDI is constructed based on the information obtained from state and municipal authorities' websites to identify how e-government policies and strategies are applied (United Nations, 2021). E-Government Development Index is an explanatory variable. As a proxy of central and sub-central government brand and citizens' loyalty (dependent variable), it is chosen an indicator of Trust in Government that is calculated by the Organisation for Economic Co-operation and Development (OECD, 2021) and refers to the share of people who report having confidence in the national government.

Regression models also include a sample of control variables such as Worldwide Governance Indicators: Control of Corruption (CC), Government Effectiveness (GE), Political Stability and Absence of Violence (PS), Regulatory Quality (RQ), Rule of Law (RL), and Voice and Accountability (VA). (World Bank, 2021). The country sample consists of 19 OECD member states (European countries): Austria, Belgium, Czech Republic, Denmark, Finland, France, Greece, Hungary, Italy, The Netherlands, Poland, Portugal, Slovak Republic, Sweden, Great Britain, Estonia, Latvia, Lithuania, and Slovenia.

Time horizon – 2008-2020 (specifically, 2008, 2010, 2012, 2014, 2016, 2018, 2020).

Testing the hypothesis involves the gradual implementation of the following steps:

− the primary analysis of statistical data (descriptive statistics);

− identification the type of functional dependence between the selected variables based on the Hausman test (fixed or random effects model);

− formalization of the relationship between e-governance and trust in government based on panel data regression model.

For performing all these steps, Stata 12/SE software was used.
Results. Thus, to identify key contextual directions of scientific research on e-governance and marketing and management strategy of central and sub-central government perspectives and clarify its intercepts, a bibliometric analysis was realized using VOSviewer v.1.6.16 (Figure 1).

Figure 1. Results of bibliometric analysis based on Scopus publications for the period 2001–2021
Sources: developed by the authors based on (Scopus, 2021) using (VOSviewer, 2021).

Thus, based on the analysis of 257 publications in Scopus in 2001–2021, dedicated to both e-governance, marketing, and management issues. It was identified 6 contextual clusters of such researches:

1) impact on innovation and country/region/city sustainable development (red cluster);
2) agriculture and rural development (green cluster);
3) cloud technologies, saving and processing data (dark blue cluster);
4) artificial intelligence and social media (violet cluster);
5) quality assurance (yellow cluster).

Therefore, it could be underlined that in the intercept of e-governance and marketing and management, there are a multidimensional set of tasks: from the most global issue – ensuring sustainable development and innovation emergency and dissemination to quality assurance of central and sub-central government activity. Besides, during the last decades, more and more prevalent such perspectives of e-governance and marketing and management intercept as cloud technologies, saving and processing data, and artificial intelligence and social media marketing. Moreover, it could be pointed out that effective e-government policy forms a background for trust in government at different levels.

After identifying the key conceptual clusters of research on the intercept of e-governance and marketing and management, it should be valuable to highlight the most cited publication in this field for the period 2001–2021 (Table 1).
### Table 1. Ten most cited Scopus publication on intercept of «e-governance» and «marketing» for the period 2001–2021

| №  | Publication title                                                                 | Authors                        | Year | Source                                                                 | Number of citations |
|----|----------------------------------------------------------------------------------|--------------------------------|------|------------------------------------------------------------------------|---------------------|
| 1  | Internet X-ray: E-governance, transparency, and the politics of immediation in India | Mazzarella, W.                 | 2006 | Public Culture 18(3), 473-505                                         | 120                 |
| 2  | Managing stakeholder interests in e-government implementation: Lessons learned from a Singapore e-government project | Tan, C.-W., Pan, S.L., Lim, E.T.K. | 2005 | Journal of Global Information Management 13(1), 31-53                | 89                  |
| 3  | Realising e-government in the UK: Rural and urban challenges                       | Choudrie, J., Weerakkody, V., Jones, S., Stock, W.G. | 2005 | Journal of Enterprise Information Management 18(5), 568-585            | 77                  |
| 4  | Informational cities: Analysis and construction of cities in the knowledge society |                                  | 2011 | Journal of the American Society for Information Science and Technology 62(5), 963-986 Public Performance and Management Review | 60                  |
| 5  | Transparency, E-government, and accountability: Some issues and considerations     | Halachmi, A., Greiling, D.      | 2013 | Public Performance and Management Review 36(4), pp. 562-584 Mobilities 7(1), pp. 13-31 Human-Centered System Design for Electronic Governance | 55                  |
| 6  | City Branding and Social Inclusion in the Glocal City                              | Paganoni, M.C.                 | 2012 | Public Performance and Management Review 36(4), pp. 562-584 Mobilities 7(1), pp. 13-31 Human-Centered System Design for Electronic Governance | 39                  |
| 7  | Social media and citizen engagement: Two cases from the Philippines (Book Chapter) | Cabotaje, C.E., Alampay, E.A.  | 2013 | Public Performance and Management Review 36(4), pp. 562-584 Mobilities 7(1), pp. 13-31 Human-Centered System Design for Electronic Governance | 35                  |
| 8  | A citizen-centric platform to support networking in the area of e-democracy (Book Chapter) | Molinari, F., Wills, C., Koumpis, A., Moumtzi, V. | 2010 | Cases on Adoption, Diffusion, and Evaluation of Global E-Governance Systems: Impact at the Grass Roots pp. 225-238 | 34                  |
| 9  | Information security threats in ERP enabled E-governance: Challenges and solutions (Book Chapter) | Sahi, G., Madan, S.            | 2013 | Cases on Adoption, Diffusion, and Evaluation of Global E-Governance Systems: Impact at the Grass Roots pp. 225-238 | 33                  |
| 10 | Politics, accountability, and information management (Book Chapter)               | Rocheleau, B.                  | 2007 | Enterprise Resource Planning: Concepts, Methodologies, Tools, and Applications 2-3, pp. 825-837 Modern Public Information Technology Systems: Issues and Challenges | 33                  |

Sources: developed by the authors based on (Scopus, 2021).

Therefore, it can be concluded that the domain of the most cited Scopus publications aimed at research of some specific national examples of implementation of e-governance initiatives, their benefits,
and constraints. Besides, several publications mentioned above focused on the municipal perspective and city brand formation.

Considering most cited Scopus publication e-governance innovation analysis, it might be pointed out that authors of these articles lead to several common conclusions:

- e-government instruments become more and more important over the last decade and is an integral element of efficiency both central and sub-central governments;
- accountability and transparency of central and sub-central governments lead to the growth of loyalty to them;
- accountability and transparency of central and sub-central governments stimulate population involvement in local community life and active implementation of democratic transformations;
- city brand highly dependent on information technologies and e-governance issues.

The next stage of the research is the general characteristics of the descriptive statistics (Table 2).

**Table 2. Descriptive statistics**

| Variable | Observation | Mean | Standard Deviation | Min | Max |
|----------|-------------|------|--------------------|-----|-----|
| Trust    | 133         | 38.688 | 14.971             | 10.724 | 80.863 |
| EDGI     | 133         | 0.764  | 0.105              | 0.558 | 0.976 |
| CC       | 133         | 1.074  | 0.776              | -0.189 | 2.393 |
| GE       | 133         | 1.184  | 0.518              | 0.227 | 2.251 |
| PS       | 133         | 0.751  | 0.34               | -0.217 | 1.446 |
| RQ       | 133         | 1.233  | 0.424              | 0.148 | 2.02  |
| RL       | 133         | 1.205  | 0.558              | 0.107 | 2.1   |
| VA       | 133         | 1.148  | 0.302              | 0.22  | 1.89  |

Notes: Trust – an indicator of Trust in Government; EDGI – E-Government Development Index; CC – Control of Corruption; GE – Government Effectiveness; PS – Political Stability and Absence of Violence; RQ – Regulatory Quality; RL – Rule of Law; VA – Voice and Accountability.

Sources: developed by the authors using Stata 12/SE.

First of all, it should be noted that there are no omitted variables. Therefore, this panel is strongly balanced. Based on the data from Table 2, it can be noted that the share of respondents that answer «yes» to the question «In this country, do you have confidence in national government?» (OECD, 2021) varies significantly during the analyzed period in the 19 selected European OECD member states. The lowest level of trust in government was in 2010 in Latvia – only 10.72% of respondents declared that they have confidence in the national government. On the other hand, the highest level of trust in government was in Finland in 2020 (80.86%). E-Government Development Index also varies considerably between countries: the highest level of e-governance instruments implementation is in Denmark in 2020, while the lowest – in Poland in 2010. The next stage of the research aimed to clarify the model’s specification with the Hausman test (fixed or random effects). Practical application of the Hausman test allows identifying those random effects panel regression model fits data better.

The next stage of the research is panel data regression analysis. Results of the regression analysis are presented in Tables 3.

**Table 3. Results of the identification the relationship between trust in government and e-governance in 2008–2020 in 19 European OECD member states**

| Trust | Coefficients | Standard Error | t-value | p-value | 95% Confidence Interval | Sig |
|-------|--------------|----------------|---------|---------|-------------------------|-----|
| EDGI  | 36.383       | 10.384         | 3.51    | 0.000   | 16.070                  | 56.695 *** |
| CC    | 3.700        | 4.726          | 0.78    | 0.434   | -5.564                  | 12.964 **  |
| GE    | 15.050       | 6.593          | 2.28    | 0.022   | 2.129                   | 27.972 **  |
As far as it could be seen from the panel data regression results (random-effects model specification), the model might be considered as statistically significant because the coefficient of determination is relatively high and is 0.675 (selected to the model explanatory variable explain 67.5% of trust in government variation). Besides, there is a strong positive relationship between trust in government and efficiency of e-governance implementation: an increase of E-Government Development Index would increase citizens' confidence in government by 36.38% at 1% confidence level. It is also revealed that control of corruption, regulatory quality, voice, and accountability had no statistically significant impact on the dependent variable. Basically, positive transformations in citizens' confidence in government are triggered by:

- political stability and absence of violence – an increase of control variable in a point leads to increase of trust in government in 9.51% at 1% confidence level;
- government effectiveness – an increase of control variable in a point leads to increase of trust in government in 15.05% at 5% confidence level;
- the rule of law – an increase of control variable in a point leads to trust rise in government by 10.25% at 10% confidence level.

Conclusions. At the present development stage of world economic relations, implementation of innovative instruments in marketing and management strategy of public authorities and local self-government is important because the level of loyalty of the country’s population or a certain territorial community significantly affects the success of government officials in the next election. However, this loyalty is formed under the influence of several factors. Still, researchers emphasized that e-government services had a significant positive impact on the residents’ loyalty. That could be explained, in particular, by the transparency of goals, objectives, and results of political decisions of government officials, opportunities for participation of community members in its life allow to ensure the integrity of officials and partially influence their decisions. Bibliometric analysis based on the 257 publications indexed by Scopus database from 2001 to 2021, dedicated to both e-government, marketing, and management issues, allowed clarifying 6 contextual clusters of such research focused on: 1) impact on innovation and sustainable country/region/city development; 2) agriculture and rural development; 3) cloud technologies, saving and processing data; 4) artificial intelligent and social media; 5) quality assurance. Realization of panel data regression analysis on identifying the relationship between trust in government and e-governance in 2008–2020 in 19 European OECD member states allowed concluding that in the selected countries, trust in government strongly depends on e-governance efficiency, government effectiveness, and government effectiveness, political stability, and the rule of law.
Therefore, it might be concluded that the implementation of e-governance instruments might become an integral element of central and sub-central governments’ marketing and management strategy in these countries.

**Author Contributions:** conceptualization, A. V. and V. S.; methodology, A. V.; software, A. V.; validation, A. V. and V. S; formal analysis, V. S.; investigation, V. S.; data curation, V. S.; writing—original draft preparation, A. V.; writing—review and editing, A. V.; visualization, A. V.; supervision, A. V.; project administration, A. V.

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Маркетинг і менеджмент інновацій в публічному управлінні як ключові детермінанти довіри

Державне управління суттєво трансформувалось за останні кілька десятиліть під впливом численних численними зовнішніх та внутрішніх факторів. Цифровізація соціально-економічних відносин призводить до появи та впровадження нового виду інновацій у державному управлінні - електронного врядування. Тому розробка стратегії маркетингу та менеджменту таким видом інновацій, як електронне врядування, вважається необхідною передумовою довіри до уряду.

Метою статті є визначення впливу електронного врядування на довіру до уряду та розробка рекомендацій щодо маркетингу та менеджменту ним. У статті систематизовано основні національні та зарубіжні підходи до вимірювання ефективності електронного врядування як на рівні центрального, так і субцентрального урядів. Також здійснено бібліометричний аналіз за допомогою VOSviewer v.1.6.16 з метою виявлення ключових контекстуальних напрямків наукових досліджень з питань електронного врядування та маркетингу та менеджменту, а також конкретизації їх змістовних перетинів. У статті висунуто та перевірено наукову гіпотезу про позитивний вплив електронного врядування на бренд центральної та субцентральної влади та лояльність громадян. Для перевірки цієї гіпотези було здійснено регресійний аналіз на панельних даних за допомогою програмного забезпечення Stata 12/SE. У регресійній моделі як вимірник ефективності електронного врядування (незалежна змінна) обрано Індекс розвитку електронного управління (EGDI), який є композитним індикатором з трьох індексів, таких як індекс онлайн-услуг, індекс телекомунікацій та індекс людського капіталу. У якості параметра оцінювання довіри до центрального та субцентрального уряду та лояльності громадян (залежна змінна) обрано показник покращення довіри до уряду, який розраховується Організацією економічного співробітництва та розвитку (ОЕСР) і характеризує частку людей, які подали інформацію про довіру до національного уряду.

Ключові слова: маркетинг, управління, інновації, електронне врядування, довіра до уряду, регресійний аналіз на панельних даних.