Original Research

Public Participation and Risk Prevention in the Process of Digital Governance of Environment: Performance Evaluation, Influence Mechanism and Improvement Path

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Abstract

The factor analysis method is used to evaluate the public participation performance in the process of Digitization of environmental governance (DEG), and the influence mechanism and path effect of environmental attitude (EA), social influence (SI), risk control perception (RP) and other factors on public participation performance (PPP) are studied by constructing structural equation model in this paper. The results suggest that: (1) the PPP is heterogeneous in terms of gender, urban and rural areas, age and provinces, and is affected by the individual characteristics of the public, environmental attitudes, social networks, the level of socio-economic development, governance ability. (2) Internal EA and external SI are important factors that affect the PPP in the process of DEG. Establishing a correct environmental attitude can enhance the public's willingness to participate DEG. External social network is a kind of social capital, which can not only enhance the social influence, but also promote the public participation performance. (3) EA and SI affect PPP through the intermediary variable of "risk control perception", the intermediary effect of EA and PPP is partial intermediary, the intermediary effect of SI and PPP is complete mediation. Accordingly, a series of future development paths and countermeasures have been put forward, such as promoting balanced development, improving environmental literacy, improving governance network and strengthening risk prevention and control.

Keywords: digitization of environmental governance, public participation, risk control perception, performance evaluation, Influence mechanism

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Research Background

In November 2021, the 14th Five-year Plan adopted by the State Council of China clearly pointed out: "it is necessary to speed up the construction of digital government and improve the level of government services." In June 2022, the Guidance on Strengthening the Construction of Digital Government issued by the State Council proposed to "comprehensively promote the digital transformation of environmental protection, enhance the carrying capacity of environment and the ability of coordinated management of environmental protection, establish an integrated intelligent perception system of ecological environment, and build an information platform for integrated environmental management." Environmental governance is making great strides towards the multi-scene pattern of "digitization" and "intelligence". With the embedding of digital intelligent technology in physical space and social space, the new governance logic and rule framework is also developing and improving. In the context of interactive entanglement and embedded cooperation of multi-forces, the complexity of environmental governance and information fission continue to enhance the breadth and depth of public participation [1-3]. The sharing, boundlessness and interaction of resources and information enhance the channels and discourse power of public participation, and reflect the flat, decentralized and interactive social power allocation reshaping in the environmental governance system. On the other hand, the embedding and development of new technology, new media, new space and new order have influenced the original organizational form and brought a lot of governance risks, which leads to some derivative problems, such as technicalism, goal displacement, "governance suspension", "digital divide", privacy risk, ethical risk, governance control distortion, incentive structure imbalance [4-6]. Therefore, it is necessary to systematically sort out and comprehensively evaluate the public participation performance in the process of DEG, analyze the governance risks and dilemmas, and deeply study the internal mechanism in order to improve the toughness and efficiency of environmental governance.

Digital governance emphasizes technological empowerment. In the context of technology embedding, various subjects intertwined with each other, among which the power of public participation should not be underestimated. The public plays a very important role in various governance activities, whether in the emergency management of environmental pollution, feedback and solution of environmental demands, or in the interaction of governance and the sharing of information resources. The motivation of public participation is diversified, and the participation process and effect of different groups are also different [7]. In the process of DEG, it is faced with differential governance dilemmas and governance risks. However, at present, there are few researches on performance evaluation, mechanism exploration and risk prevention of public participation in DEG, and there are certain "blind spots" and "vacuum zones". A large number of groups participate in the practice of environmental governance in different ways, promote public decision-making action, and inject new vitality into the handling of social and public affairs, which broadens the space for public participation and opinion expression. However, it is worth noting that this is inevitably accompanied by problems such as low overall quality and the risk of digital governance, which forms a new test for the traditional national governance system and governance ability. What is the public participation performance in DEG? What kind of risks do you face? What is the internal mechanism of public participation performance? How to improve the future development path? These are several key research questions in this study.

Literature Review

Evaluation of Public Participation Performance (PPP) in DEG

In the previous literature of public participation in environmental governance, the analysis dimensions of PPP including the intensity of public participation, public satisfaction, the degree of resolution [8-9]. However, there is almost no performance evaluation specifically around the DEG. In the process of designing the index system, the process and outcome indicators of public participation are not taken into account. Or, only the qualitative index system of government departments at the macro level is designed, and the effect of public participation is not systematically evaluated. In the practice of DEG, the intelligent concept that haunts the governance subject has not yet been established, and the choice of technology leads to the imbalance between subject structure and power, the low efficiency of cooperative governance process, and it is also possible to fall into the quagmire of "negative energy of digital technology", which hinders the demonstration of the enabling effect of digital technology. Accordingly, it may be necessary to systematically evaluate the overall effectiveness of public participation in DEG from the aspects of government governance capacity and structural adjustment, the effectiveness of the process of public participation, the effectiveness of the results of public participation, the effectiveness of governance network cooperation, the effectiveness of risk prevention.

Influence Mechanism of PPP in the Process of DEG

In the analysis of the internal mechanism and Improvement Path of PPP in the Process of DEG, scholars in the past mainly studied the factors influencing the public's willingness and behavior to adopt E-government, including the compatibility,

complexity, testability of e-government platform optimization and innovation diffusion; public social cognition, government trust, platform trust and willingness to participate; perceived usefulness and perceived ease of use of digital governance platform; public performance expectations, effort expectations, social influence, convenience conditions; government digital governance platform information quality, system quality, service quality and other factors [10-15]. The main theories and models used including innovation diffusion theory (IDT), social cognitive theory (SCT), theory of planned behavior (TPB), technology acceptance model (TAM), and unified theory of acceptance and use of technology (UTAUT), DeLone and McLean model of IS success (D & M), trust theory [16-33], but fail to fully consider the actual situation of China. In addition. In the process of DEG in China, we are faced with a larger mass base, more diverse subjects, more complex problems and strong regional imbalance, which requires that the intertwining and interaction of governance subjects, the cooperation of governance departments, the complexity of governance network and diversified governance risks should be considered in the process of studying the influence mechanism. In terms of countermeasures and suggestions, the existing research focuses on the macro top-level design, without taking into account the particularity of environmental governance. In the research method, it is dominated by case study and text analysis. A small number of empirical analysis scholars based on questionnaire survey data to study the influence of digital media form, media use behavior and media contact frequency on different types of group participation behavior. However, in the existing domestic literature, the research perspective and research methods show a certain degree of homogenization trend, which leads to a significant reduction in the innovation of research viewpoints and conclusions.

Research Design

Large-scale questionnaires are distributed to multiple subjects of environmental governance to collect data for empirical research, including members of the environmental NGO organization, users of the DEG platform, the general public and so on. A total of 400 questionnaires were distributed and 392 were collected, including 197 males and 195 females, with a balanced gender distribution, from 31 provinces of Chinese mainland. The sample has a good representation to meet the needs of the research. The variable design and questionnaire measurement are shown in Table 1. The performance evaluation level includes five dimensions: Effectiveness of process (EP), Effectiveness of results (ER), Effectiveness of technical platform (ET), Effectiveness of collaborative networks (EN) and Effectiveness of risk prevention (ERP). At the level of influence mechanism, based on theory of reasoned

action (TRA) and UTAUT2 models [34-36], the effects of environmental attitude (EA), social Influence (SI) and risk control perception (RP) on PPP in DEG are explored.

Empirical Analysis and Results

Factor Analysis and Performance Evaluation

KMO test and Bartlett sphere test are needed to determine the relevance and applicability of the data by testing the applicability and index correlation of the samples before factor analysis. The results of data analysis show that the value of KMO is 0.825, which is within the acceptable range. The chi-square value of the Bartlett spherical test is 232.617 and the degree of freedom is 36, and the significance level P value is 0, indicating that these data come from the normal distribution population, and there are common factors among the correlation matrices of the data samples, which is suitable for factor analysis. In this work, the characteristic value greater than 1 is taken as the standard extraction factor, and the maximum variance method is used for orthogonal rotation. According to Table 2, five common factors are extracted from the variables of public participation performance, which are consistent with the expectations in Table 1. Each variable has a higher load on only one factor, and the absolute value of the load is more than 0.8. Therefore, it has high constructive validity. In addition, the Cronbach α coefficients of the four sub-dimensions of public participation performance are all greater than 0.8. therefore, each dimension has high reliability. The factor 1 is EP, the factor 2 is ER, the factor 3 is ET, the factor 4 is EN, and the factor 5 is ERP.

Performance Differences at the Level of Individual Characteristics

The overall performance results can be calculated by weighting the factors according to the variance explanation rate. On this basis, it is divided into two groups according to gender, urban and rural areas to analyze the performance differences at the level of individual characteristics. The final evaluation results of factor analysis are shown in Table 3. The participation performance of female groups is lower than that of men, the participation performance of rural groups is lower than that of cities, and the difference between urban and rural areas is greater than that of gender. In addition, it is obvious that there are differences in performance among different age groups. The participation performance of young and middle-aged groups is significantly higher than that of minors and elderly groups. This is mainly because the enthusiasm of women to participate in environmental governance is less than that of men in China. Compared with rural residents, urban residents generally have a wide

Table 1. Studies Dimensions, Variable Measures and Operational Definitions.

Dimension	Variable	Operational Definition	Code
Performance Evaluation	EP	1. Be able to easily participate in DEG 2. Information resources involved in environmental governance are easily accessible 3. There are multiple channels to participate in DEG 4. The cost of participating in DEG is not high	EP1 EP2 EP3 EP4
	ER	1. The feedback problems can be solved effectively 2. The opinions and suggestions can be adopted 3. Satisfaction has been improved after participating in DEG 4. The environment quality has been improved after participating in the DEG	ER1 ER2 ER3 ER4
	ET	1. The digital governance platform can provide useful information for the public 2. The digital governance platform can provide effective services for the public 3. The digital governance platform can improve the efficiency of the public	ET1 ET2 ET3
	EN	1. There are multi-actors in DEG 2. The cooperation among the multi-actors in DEG is smooth 3. The communication between the multi-actors of DEG is timely	EN1 EN2 EN3
	ERP	1. In the process of participating in DEG, government departments carry out risk early warning in advance 2. No risk has been encountered in the process of participating in the DEG 3. In the process of participating in the DEG, the risk can be solved effectively	ERP1 ERP2 ERP3
Influencing Mechanism	RP	1. The perception of the city affected by environmental pollution 2. The personal perception of being affected by environmental pollution 3. Risk control perception of individual participation in DEG	RP1 RP2 RP3
	EA	1. Do you think it is important to protect the environment 2. Whether to protest against environmental pollution 3. Are you full of confidence in the government's environmental governance	EA1 EA2 EA3
	SI	1. Influence of relatives and friends 2. Government advocacy and key opinion leaders (KOL) guidance 3. Drainage on other media platforms	SI1 SI2 SI3

Table 2. Factor analysis results.

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Characteristic value	2.207	1.895	1.829	1.815	1.806
Explanation variance (%)	18.522	19.170	19.126	18.086	19.096
Cronbach α	0.853	0.936	0.906	0.856	0.925

range of participation channels and a strong sense of participation. Compared with the minors and the elderly, the young and middle-aged groups have more obvious advantages in participating in the DEG. As a result, the public participation performance in DEG will have individual differences in gender, urban and rural areas, and age. Obviously, the political participation of women is generally lower than that of men, and the degree of public participation of urban residents is significantly higher than that of rural residents. There are differences in the accessibility and ability of different social groups to the Internet, resulting in digital governance gaps such as the access gap (the first digital divide) and the use gap (the second digital divide). In addition, there are differences in environmental attitudes, environmental literacy and social networks among different groups, and there is even a literacy gap, that is, the third gap.

With the progress of technology, digital information is pushed according to the new way of communication, and the massive and mixed information tests people's ability to obtain, understand, integrate and criticize information. The digital divide leads to the inequality of public access to information, political participation and resource allocation in the digital age. Therefore, different groups have different levels of individual differences, and their participation performance in DEG is also heterogeneous.

Performance Differences at the Provincial Level

China has a vast territory, with 31 provinces. In order to compare the regional differences at the provincial level, the samples are grouped according to provinces, and then the average performance of

Table 3. Public participation performance of different groups.

Gender	Mean value	Area	Mean value
Female	-0.1284	Urban	0.3505
Male	0.1291	Rural	-0.3498

different groups distributed in 31 provinces is obtained which is ranked in Table 4. There are obvious provincial differences in the public participation performance. The groups with higher performance scores are distributed in Beijing, Shanghai, Zhejiang, Jiangsu, Guangdong and other eastern provinces, while the groups with lower performance scores are distributed in Xinjiang, Qinghai, Tibet and other western provinces. In recent years, in Chinese mainland, the popularity of social media represented by Weibo and Wechat has promoted the expansion and deepening of public participation in DEG. All provinces have set up interactive environmental governance websites, environmental protection hotlines, government affairs Weibo and government affairs Wechat. Further, some provinces have also built government affairs Douyin, Mini Program and other supervision and interactive platforms. Environmental regulatory departments through the above platform timely release of environmental policies, governance measures and other related content, to broaden the public access to environmental governance information. When the public finds any illegal, illegal and uncivilized behavior that destroys the ecological environment in their daily life, they may be allowed to report and complain through a variety of channels, such as calling the reporting number, WeChat Mini Programs, environmental government affairs Weibo, letters and visits to report complaints, or directly reporting on the spot.

Some provinces have also set up "Eco-environmental supervisors" in recent years. These supervisors are mainly responsible for publicizing the national policies and regulations on environmental protection to the public, explaining the relevant requirements of governments at all levels on environmental protection, and being good "propagandists"; conduct daily inspections and patrols, and promptly deal with and report environmental pollution incidents. They have the characteristics of voluntary, unpaid and public welfare. Among them, there are researchers, entrepreneurs, civil servants and volunteer representatives, who generally have extensive social influence and will lead and drive more citizens to participate in the protection of the ecological environment. However, it is worth noting that there are obvious differences in the level of economic and social development, information technology, public participation channels, public environmental literacy, social influence, so the public participation performance also exists heterogeneity at the provincial level. Some eastern provinces have constructed the DEG model of "Government–Enterprise–NGO Organization–Public" intertwining and embedded cooperation, while some western provinces are still in the traditional mode of single supervision by the government and environmental departments, and the digital platform is not perfect. This indirectly implies that the degree and

Table 4. Public participation performance of different provinces.

Province	Performance score	Rank	Province	Performance score	Rank
Beijing	2.2965	1	Anhui	-0.2439	17
Shanghai	1.2155	2	Jilin	-0.2519	18
Zhejiang	0.8058	3	Henan	-0.2658	19
Jiangsu	0.7786	4	Heilongjiang	-0.2761	20
Guangdong	0.4718	5	Liaoning	-0.2842	21
Shandong	0.3378	6	Gansu	-0.2923	22
Fujian	0.1356	7	Inner Mongolia	-0.3081	23
Tianjin	0.1166	8	Hunan	-0.3241	24
Chongqing	-0.0365	9	Shanxi	-0.3369	25
Hebei	-0.0508	10	Guizhou	-0.3512	26
Sichuan	-0.1226	11	Ningxia	-0.3621	27
Shaanxi	-0.1709	12	Hainan	-0.3701	28
Hubei	-0.2108	13	Xinjiang	-0.3802	29
Jiangxi	-0.2293	14	Qinghai	-0.3901	30
Yunnan	-0.2301	15	Tibet	-0.4113	31
Guangxi	-0.2364	16	Overall mean	-0.007	

breadth of public participation and performance in the eastern region are generally higher than those in the central and western regions.

Structural Equation Model and Analysis of Influence Mechanism

According to the previous analysis, the public participation performance has heterogeneity in gender, urban and rural areas, age, provinces and other levels, and is affected by the individual characteristics of the public, environmental attitudes, social networks, the level of social and economic development, governance capacity and other factors [37-38]. Taking the performance score as a dependent variable, a structural equation model is constructed to explore the influence of RP, EA and SI on the PPP in DEG. First of all, the reliability and validity of the model is tested to ensure the fitness of the model. According to the table, the overall Cronbach's α value of the questionnaire is 0.852, the Cronbach's α of RP, EA and SI are 0.825, 0.821 and 0.816 respectively, and the cumulative variance contribution rate of the three main factors is 63.981%, indicating that the reliability and validity of this study are good, and it is suitable for further empirical analysis.

Subsequently, the model was fitted by AMOS software, and the GFI value, NFI value, CFI value, AGFI value and IFI value of the model were all more than 0.9. The RMSEA value is less than 0.1, and the

RMR value is less than 0.05, indicating that the relative fitting effect is good. The results of model analysis are shown in Table 6. It is obvious that: (1) EA has a significant positive influence on PPP, the standardization path coefficient (SPC) is 0.026; (2) SI does not directly have a significant positive influence on PPP, but has a complete mediating effect; (3) RP has a significant positive influence on PPP, the SPC is 0.518; (4) EA has a significant positive influence on RP, the SPC is 0.053; (5) SI has a significant positive influence on RP, the SPC is 0.502.

In this study, the method of decomposing the model effect is used to study the partial intermediary effect and complete intermediary effect in the model. Table 7 shows the results of model effect decomposition based on Bootstrap method. The results show that: (1) the indirect effect of the path of „environmental attitude affects participation performance" does not contain 0 in the upper and lower bound of PC and BC, indicating that there is a mediating effect. The total effect is 0.121(p<0.01), the direct effect is 0.067(p<0.01), and the indirect effect is 0.054(p<0.01), indicating that environmental attitude has a positive effect on participation performance, partly through Risk control perception. (2) The indirect effect of the path of "social influence on participation performance" does not contain 0 in the upper and lower boundaries of PC and BC, indicating that there is an intermediary effect, and the direct effect contains 0 in both the upper and

Table 5. Reliability and Validity Test.

Variable	Code	Factor loading	Cronbach's α	Contribution(%)
RP	RP1	0.886	0.825	23.136
	RP2	0.877		
	RP3	0.868		
EA	EA1	0.851	0.821	21.060
	EA2	0.832		
	EA3	0.825		
SI	SI1	0.831	0.816	19.785
	SI2	0.807		
	SI3	0.812		

Table 6. Structural equation model fitting results.

Path	Path coefficient	S.E.	C.R.	P value	SPC
PPP←EA	0.067	0.011	5.825	***	0.026
PPP←SI	0.010	0.012	0.850	0.395	0.004
PPP←RP	0.361	0.005	74.358	***	0.518
RP←EA	0.151	0.009	17.017	***	0.053
RP←SI	1.093	0.009	124.674	***	0.502

Table 7. The Decomposition Results of model effect.

Variable	Effect	Path	Estimate	P value	PC		BC	
					Lower bound	Upper bound	Lower bound	Upper bound
EA	Direct effect	EA→PPP	0.067	0.001***	0.042	0.092	0.041	0.092
	Indirect effect	EA→RP→PPP	0.054	0.001***	0.047	0.062	0.047	0.061
	Total effect		0.121	0.001***				
SI	Direct effect	SI→PPP	0.010	0.395	-0.014	0.033	-0.014	0.033
	Indirect effect	SI→RP→PPP	0.395	0.001***	0.383	0.407	0.382	0.407
	Total effect		0.405	0.001***				

lower boundaries of PC and BC, indicating that there is no direct effect, so it is a complete intermediary. Specifically, the total effect is 0.405 (p<0.01), the direct effect is 0.01 (not significant), and the indirect effect is 0.395 (p<0.01), indicating that EA and SI affect PPP through the intermediary variable of "Risk control perception". The intermediary effect of EA and PPP is partly mediated, that is, EA itself not only has a direct influence on PPP, but also indirectly affects PPP through RP. The intermediary effect of SI and PPP is a complete intermediary, that is, the enhancement of SI itself does not directly affect PPP, but to enhance RP and then improve PPP, the two have different transmission paths on PPP.

Conclusions and Suggestions

Conclusion

This paper measures the performance of public participation in the process of digital governance of the environment by constructing an index system and using the method of factor analysis, and constructs an equation model to study the influence mechanism and path of environmental attitude, social influence and Risk control perception on participation performance. The main conclusions are as follows:

1) The public participation performance has heterogeneity in gender, urban and rural areas, age, provinces and other levels, and is affected by the individual characteristics of the public, environmental attitudes, social networks, the level of social and economic development, governance capacity and other factors.

2) Internal environmental attitude and external social influence are important factors that affect the public participation performance in the process of DEG. For the public themselves, the improvement of their environmental literacy and the establishment of a correct environmental attitude can promote their willingness to participate and participation performance. External social network and social influence is a kind of social capital, which can not only enhance the social influence, but also promote the public participation performance in the process of DEG.

3) Environmental attitude and social influence affect public participation performance through the intermediary variable of "Risk control perception", the effect of environmental attitude and participation performance is partial intermediary, the intermediary effect of social influence and participation performance is complete mediation. The effects of the two on participation performance have different transmission paths. This is mainly due to the fact that environmental attitude is an internal and active factor, while social influence is an external and passive factor.

Countermeasures and Suggestions

Promote the Balanced Development of DEG

The results suggest that there are individual characteristics and regional differences in the public participation performance in the process of DEG, such as gender, age, urban and rural areas, provinces, this mainly lies in the heterogeneity of regional social and economic development level, digital governance ability and public environmental literacy. Therefore, it is necessary to promote the group balance, urban-rural balance and regional balance of DEG in the future, eliminate the digital divide at various levels, realize multi-dimensional public participation and interactive embedding, enhance the breadth and depth of public participation in the DEG, and enable the DEG infiltrate into social life.

Promote the Public to Establish Correct Environmental Attitude

The internal environmental attitude will form an internal driving force to promote the public participation performance in the process of DEG. Therefore, it is suggested that the public's environmental literacy should be improved and the public should be promoted to establish a correct environmental attitude.

It is necessary to guide the public to establish the awareness of ecological environmental protection; on the other hand, it is necessary to encourage the public to use new technologies and platforms to participate in digital governance. The DEG is not achieved overnight, and it needs to be widely popularized and promoted. At the same time, government departments should enhance the digital operation ability of environmental governance, optimize the governance process, improve governance technology, build governance platform, broaden the channels of public participation, and make the public aware of the convenience and timeliness of technological governance.

Build a Perfect Governance Network and Exert the Role of Social Influence

Social influence is a kind of external influence, which can promote the public participation performance in the process of DEG. Therefore, it is necessary to build a perfect social network and form a multi-platform, full-coverage and interactive digital governance network. It is suggested that the coordination between multi-agents and various departments and platforms should be strengthened to promote the integration of digital governance resources and the sharing of information. On the other hand, it is necessary to strengthen the cooperation between regions, provinces and levels, build a flat and integrated network of DEG, strengthen the interactive participation of multiple subjects, and enhance the role of multi-level and multi-dimensional social influence.

Improve the Risk Prevention and Control Mechanism of DEG

As environmental governance enters the digital age, the complex network public opinion environment continues to affect people's political attitude and participation behavior, which challenges the realization of a new pattern of social governance of co-construction, co-governance and sharing. Digital governance, a new way of governance, includes many forces, such as individual citizens, social organizations, government departments, market subjects. In the process of technology embedding and subject interaction, there are potential risks, which need to be prevented. The public will face risks such as digital divide, privacy leakage, inability to participate and ineffective participation; on the other hand, regulators are also faced with governance dilemmas such as governance suspension, low efficiency, unclear powers and responsibilities, and weak cooperation. Additionally, "digital deviation", "digital levitation", "digital volume", "digital illusion", "digital dune" and other governance risks appear. This suggests that it is necessary to improve the risk prevention and control mechanism of DEG.

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Conflicts of Interest

The authors declare no conflicts of interest.

References

1. SKORIC M., ZHU Q., GOH D. Social media and citizen engagement:A meta-analytic review. New Media & Society, **18** (9), 1817, **2016**.
2. YANG R., CHEN J., WANG C., DONG Y. The Influence Mechanism and Path Effects of Pro-Environmental Behavior: Empirical Study Based on the Structural Equation Modeling. Polish Journal of Environmental Studies, **31** (5), 4447, **2022**.
3. RAMIREZ J.P., ESCOBAR M., LANS I., HINCAPIE. Government influence on E-government adoption by citizens in Colombia: Empirical evidence in a Latin American context. PLoS ONE, **17** (2), 264495, **2022**.
4. NAM T. What determines the acceptance of government surveillance? Examining the influence of information privacy correlates. The Social Science Journal, **56** (04), 530, **2019**.
5. YANG L., ELISA N., ELIOT N. Privacy and Security Aspects of E-Government in Smart Cities. Smart Cities Cybersecurity and Privacy, **12** (5), 89, **2019**.
6. BELANGER F., CARTER L. Trust and risk in E-government adoption. Journal of Strategic Information Systems, **17** (2), 165, **2008**.
7. YANG R., XU K., DA W. Research on the Influence Mechanism of Public Participation in Environmental Governance in the Context of Big Data: Based on the Theory of Planned Behavior and the Norm Activation Model Integrated Analysis Framework. Polish Journal of Environmental Studies, **31** (6), 5371, **2022**.
8. ZHENG Y., YANG R. Environmental regulation, public participation and happiness: empirical research based on Chinese general social survey of 2015.Applied Ecology and Environmental Research, **17** (4), 9317, **2019**.
9. NAM H., NAM T., OH M., CHOI S. An Efficiency Measurement of E-Government Performance for Network Readiness: Non-Parametric Frontier Approach. Journal of Open Innovation: Technology, Market, and Complexity. **8** (1), 10, **2022**.
10. ALMACH M.A., NASEREDDIN Y. Factors influencing the adoption of E-government services among Jordanian citizens. Electronic Government an International Journal, **16** (3), 236, **2020**.
11. MENSAH I.K., LUO C. Exploring Factors Determining Chinese College Students' Satisfaction With E-Government Services: The Technology Acceptance Model (TAM) Approach. Information Resources Management Journal, **34** (3), 1, **2021**.
12. MENSAH I.K., ADAMS S. A comparative analysis of the impact of political trust on the adoption of E-Government services.International Journal of Public Administration. **43**, 682, **2020**.

13. TSAI, CHUNG HUNG. Integrating Social Capital Theory, Social Cognitive Theory, and the Technology Acceptance Model to Explore a Behavioral Model of Telehealth Systems. International Journal of Environmental Research and Public Health, **11** (5), 4905, **2014**.

14. ALMAIAH M.A., NASEREDDIN Y. Factors influencing the adoption of E-government services among Jordanian citizens, Electronic Government an International Journal, **16** (3), 236, **2020**.

15. GUPTA K.P., SINGH S., BHASKAR P. Citizen adoption of E-government: A literature review and conceptual framework. Electronic Government an International Journal, **12** (2), 160, **2016**.

16. RANA N.P., DWIVEDI Y.K. Citizen's adoption of an E-government system: Validating extended social cognitive theory (SCT). Government Information Quarterly, **32** (02), 172, **2015**.

17. ABDELHAKIM D., IDOUGHI D. Citizen Adoption of Mobile and Customizable E-Government Services: A Literature Review and Conceptual Framework. International Journal of Information Systems in the Service Sector, **13** (1), 31, **2021**.

18. LALLMAHOMED M., LALLMAHOMED N., LALLMAHOMED G.M. Factors influencing the adoption of E-Government services in Mauritius. Telematics and Informatics. **34** (4), 57, **2017**.

19. REHMAN M., KAMAL M.M., ESICHAIKUL V. Adoption of E-Government Services in Pakistan: A Comparative Study Between Online and Offline Users. Inform.Information Systems Management. **33** (3), 248, **2016**.

20. XIE Q., SONG W., PENG X., SHABBIR M. Predictors for E-government adoption: Integrating TAM, TPB, trust and perceived risk. The Electronic Library. **35** (1), 2, **2017**.

21. CARTER L., WEERAKKODY V., PHILIPS B., DWIVEDI Y.K. Citizen Adoption of E-Government Services: Exploring Citizen Perceptions of Online Services in the United States and United Kingdom. Information Systems Management, **24** (02), 124, **2016**.

22. JAIN N.K., BHASKAR K., JAIN S. What drives adoption intention of electric vehicles in India? An integrated UTAUT model with environmental concerns, perceived risk and government support. Research in transportation business and management, **42** (03), 1, **2022**.

23. MANSOORI K.A., SARABDEEN J., TCHANTCHANE A.L. Investigating Emirati citizens' adoption of E-government services in Abu Dhabi using modified UTAUT mode. Information technology & people, **31** (02), 455, **2018**.

24. RODRIGUES G., SARABDEEN J., BALASUBRAMANIAN S. Factors that Influence Consumer Adoption of E-government Services in the UAE: A UTAUT Model Perspective. Journal of Internet Commerce, **15** (1), 18, **2016**.

25. ZEEBAREE M., AGOYI, M., AQEL M., LI M.S. Sustainable Adoption of E-Government from the UTAUT Perspective. Sustainability, **14** (7), 5370, **2022**.

26. VEERAMOOTOO N., NUNKOO R., DWIVEDI Y.K. What determines success of an E-government service? Validation of an integrative model of E-filing continuance usage. Government Information Quarterly, **35** (2), 161, **2018**.

27. JASIMUDDIN S.M., MISHRA N., NASSER A. Modelling the factors that influence the acceptance of digital technologies in e-government services in the UAE: a PLS-SEM Approach. Production Planning and Control, **28** (16), 1307, **2017**.

28. PUSP J., SHAREEFUL I. E-Government Maturity Model for Sustainable E-Government Services from the Perspective of Developing Countries. Sustainability, **10** (6), 1882, **2018**.

29. LI W. The Role of Trust and Risk in Citizens' E-Government Services Adoption: A Perspective of the Extended UTAUT Model. Sustainability, **13**, 7671, **2021**.

30. ISAAC K.M., SAMUEL ADAMS.A comparative analysis of the impact of political trust on the adoption of E-Government services. International Journal of Public Administration, **43** (08), 682, **2020**.

31. SABANI A. Investigating the influence of transparency on the adoption of E-Government in Indonesia. Journal of Science and Technology Policy Management, **12**(2), 1,**2020**.

32. UNDIPHIR B, PHIR J. Assessing Factors Affecting the Adoption of E-Government Services in Developing Countries for Transport Sector, amidst the Covid-19 Pandemic. Communications and Network, **14** (2),69, **2022** .

33. CHIPETA J., NGOYI L. A Review of E-Government Development in Africa: A Case of Zambia. Journal of E-Government Studies and Best Practices. Journal of E-Government Studies and Best Practices, **20** (18), 1, **2018**.

34. DWIVEDI Y.K., RANA N.P., ALRYALAT M. Citizen's Adoption of an E-Government System: Validating the Extended Theory of Reasoned Action (TRA) [J]. International Journal of Electronic Government Research, **11** (4), 1, **2015**.

35. FAKHOURY R., CHEBARO B. E-Government Acceptance and Trust: An Empirical Model Based on UTAUT2 in Lebanon. International Journal of Technology Diffusion, **12** (2), 16, **2021**.

36. APFEL D., HERBES C. What Drives Senegalese SMEs to Adopt Renewable Energy Technologies? Applying an Extended UTAUT2 Model to a Developing Economy. Sustainability, **13** (16), 9332, **2021**.

37. ALMAMY A. Understanding Factors Affecting E-Government Adoption in Saudi Arabia: The Role of Religiosity. International Journal of Customer Relationship Marketing and Management, **13** (1), 1, **2022**.

38. SAWALHA S., JAMAL M.A., SHANAB E. The influence of utilising Facebook on E-government adoption. Electronic Government an International Journal, **15** (1), 1, **2019**.