



Department of
Economic and
Social Affairs



Assessment of selected Greek cities using Local Online Service Index (LOSI)

ONLINE SERVICE DELIVERY IN GREECE

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DIGITAL GOVERNMENT

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The LOSI application in Greece was conducted by the Department of Information and Communication Systems Engineering (ICSD) of University of Aegean. The Department's mission is to provide a first-class specialist technological education aimed to produce highly skilled graduates. More specifically, the objectives of the ICSD Department are the following:

- Achieving superior educational standards based on international academic models
- Offering technology-oriented studies
- Keeping up with new developments in research and technology
- Providing students with the skills and knowledge that will enable them to flourish in competitive work environments, conduct research, pursue postgraduate studies, and be constantly up to date with new research and technology developments through lifelong learning

We extend our acknowledgment to the United Nations University Operating Unit on Policy-Driven Electronic Governance (UNU-EGOV), and the United Nations Department of Economic and Social Affairs (UNDESA) for the support with the LOSI methodology. A special acknowledgment to all the researchers who worked on LOSI application.

1. Introduction

Cities are essentially a collection of humans, social, economic and cultural networks and are settings in which a sense of belonging and togetherness can be fostered and in which the public processes that support social cohesiveness and development can be optimized and made more efficient and efficacious. Towards this end, increased attention should be given to assessing the online presence of local government in cities. A logical starting point is assessing the role of cities as service providers and examining city portals as the key mechanism for e-government in such contexts.

Local Online Service Index (LOSI) is used, since 2018, by UN DESA to assess local government portals. This process was initiated in 2018 as a pilot study assessing portals in 40 cities, following 2020 with 100 cities and 2022 with 193 cities.

The burgeoning interest in e-Government development, combined with the growing number of requests from research community and local government officers worldwide, led the study organizers to establish the LOSI Network. The Division for Public Institutions and Digital Government of the United Nations Department of Economic and Social Affairs (UN DESA) and the United Nations University Operating Unit on Policy Driven Electronic Governance (UNU-EGOV), have established LOSI Network.

LOSI Network includes national representative entities that are willing to apply LOSI instrument in their national context, assessing municipalities' portals. Greece is one of the countries that are represented in LOSI network. This initiative is expected to help in assessing a much larger number of portals bringing:

- Broader coverage and representation of the status/maturity of local e-government;
- A more comprehensive and complete portrait of local e-government worldwide, with the larger survey sample allowing more accurate insights, more consistent analysis, and the opportunity to better identify the challenges, difficulties and opportunities cities have in common (and where there is divergence);
- The opportunity to engage in broader evidence-based analysis of the online presence of local governments worldwide, with increased capacity for productive comparisons and the ability to identify areas in need of improvement;
- The establishment of a network of experts and practitioners that can share good practices and lessons learned.

The second chapter describes briefly LOSI methodology. Chapter three presents Greek context and the results of LOSI application in Greek cities. Based on the results, chapter four introduces some suggestions that could advance local e-Government in Greece. Chapter five concludes the report.

2. Assessment Methodology

2.1 Study Responsible

The Department of Information and Communication Systems Engineering of the University of the Aegean, member of LOSI Network, in collaboration with the United Nations University Operating Unit on Policy-Driven Electronic Governance (UNU-EGOV), applied LOSI in Greece in 2023. In particular, the specific research was completed under the direction of professor Yannis Charalabidis, assistant professor Charalampos Alexopoulos and the supervision of UNU-GOV senior research analyst Demetrios Sarantis. Ioanna Panagiotaki and Maria Vasiliadou, postgraduate students of the "Electronic Government" MSc Program of the University of the Aegean, conducted the assessment in 74 Greek municipalities.

2.2 The Instrument

The applied version of LOSI (2022) comprises 86 indicators (list with the indicators in the Appendix) classified in five criteria: Institutional Framework (8) (Annex Table 1), Content Provision (25) (Annex Table 2), Services Provision (18) (Annex Table 3), Participation and Engagement (17) (Annex Table 4), and Technology (18) (Annex Table 5). The institutional framework criterion focuses on municipal e-Government strategy, organizational structure, legislation, governing access to information and privacy, and open data policy. For content provision, the aim is to identify the extent to which essential public information and resources are available online. The third criterion is services provision, focusing on the availability and delivery of targeted government services, and the fourth criterion is participation and engagement, which assesses the availability of mechanisms and initiatives for interaction and opportunities for public participation in local governance structures. The technology criterion focuses on technical features of the portals to specify how the site and content are made available for users; relevant indicators relate to factors such as accessibility, functionality, reliability, ease of navigation, visual appeal, and alignment with technology standards.

Each of the 86 LOSI indicators generated a binary question. Each indicator was ascribed a value of 1 if it was found in a municipality website (yes) and a value of 0 if it was absent (no). The overall LOSI value for a city is the normalized value of the 86 indicators for that municipality. Based on the LOSI calculated value, the top-down ranking shows the relative position of the municipality among all those measured. Based on the total number of indicators met, municipalities are assigned to one of four levels or groups ranging from very high to low. Municipalities with a very high LOSI level are those that have LOSI values between 0.75 (including 0.75) and 1.00. Municipalities in the high LOSI group have LOSI values in the range of 0.50 (including 0.50) to 0.75. In the middle LOSI group are those municipalities that have LOSI values in the range of 0.25 (including 0.25) to 0.50. Finally, cities in the low LOSI group have LOSI values between 0.00 and 0.25.

2.3 The Process

The assessment took place at the second half of 2023. The duration of each website assessment was 1.5-2 hours, while for three specific municipalities, Athens, Thessaloniki and Piraeus, the time required was 2 hours and 45 minutes approximately. Both researchers assessed 74 websites, working independently of each other. After completing the assessment of all the websites, the researchers met to resolve differences and determine the most appropriate response to the assessment indicators, as the responses were documented with references and/or commentary. Finally, the research supervisor cross-checked the data and validated the results, giving guidelines throughout the process.

For some indicators, further study and pre-work was required, in order to optimally complete the assessment. For indicator #201 about the compatibility of the website with various web browsers, the study showed that the three most popular browsers in Greece for the period June 2022 - June 2023, in descending order, are Chrome with 77.68%, Safari 7.37% and finally Firefox with 5.35%.

In indicator #202, about identifying website at the first search page of the country's three most popular search engines for the period June 2022 - June 2023, the research showed that Google is the most popular browser with 98.55%, followed by Bing with 0.92% and Yahoo with 0.33%.

The limit of 15 errors has been specified for indicators #208 and #209 and for indicator #210 the limit is 20 errors. The specific limit of errors was set to be met by 30% of municipalities. All the municipalities that, after the check, presented errors less or equal to the above limit, were rated with one (1), while the rest with zero (0).

For the needs of indicators #250 and #252 assessment, a common message was drafted in Greek, which was sent to the municipalities via email or using the online contact form of the municipalities, where this was possible. The message had the subject: "Opening hours of the Treasury/Tax Office/Request for Information" and the verbatim was: 'I would like to be informed about the opening hours of the Municipality Treasury/Tax Office, so that I can visit it to deal with a subject of my interest.'

Economic and demographic data have been drawn from the Hellenic Statistical Authority (ELSTAT) (Annex Table 6), as well as the Gross Domestic Product (GDP) of the regions and Per Capita GDP of the regions. The population density per square kilometre (sq. km) was defined by the ratio of the population (annual average) of a region to its area size (territory).

municipality was evaluated in the Very High level group, the municipality of Patra, which corresponds to 1.4% of the total population of this research.

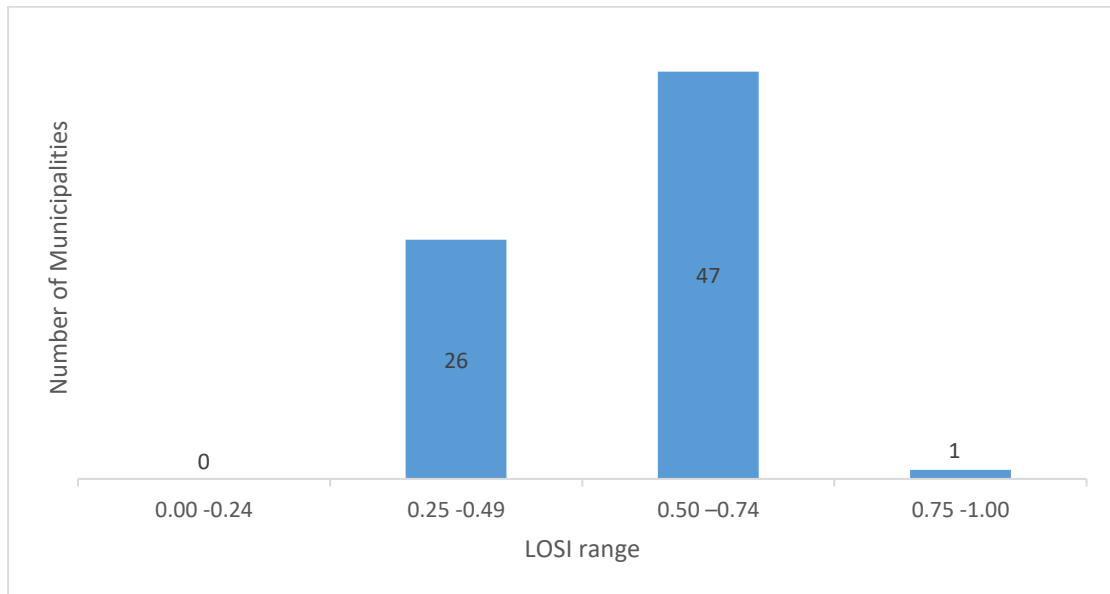


Figure 2. Distribution of municipalities' websites on LOSI levels groups

3.3 Institutional Framework

The average value for the Institutional Framework criterion is 63%. In this criterion, two (2) municipalities score in the Low-level group, fifteen (15) municipalities in the Middle level group, thirty-one (31) municipalities in the High-level group and twenty-six (26) municipalities in the Very High level group.

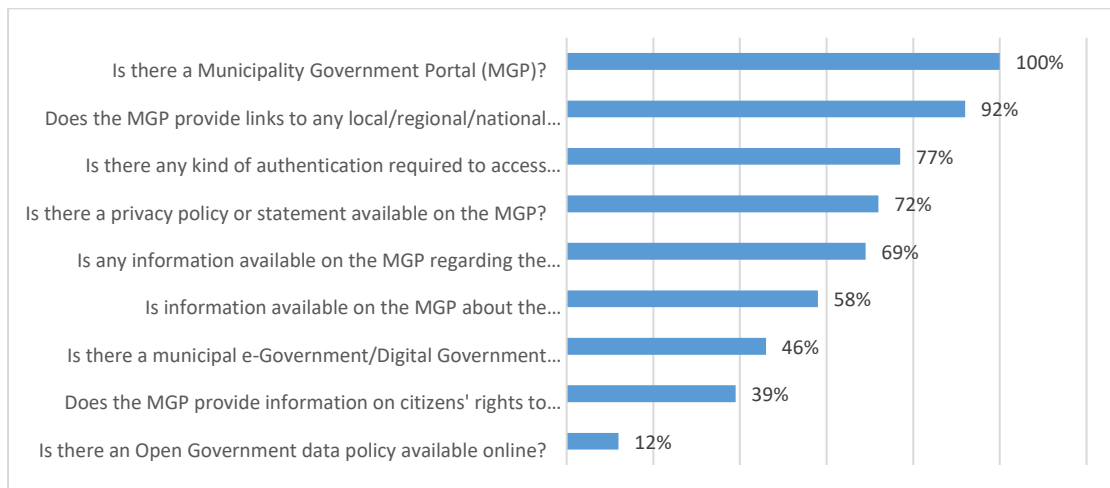


Figure 3. Institutional framework Indicators (percentage of cities that satisfy the indicator)

All Greek municipalities maintain an official website, 92% of them provide links to other local/regional/national organizations' websites. User authentication for the provision of digital services is required by 77% of websites, while 72% provide information related to the privacy policy from a website. 69% of the websites disclose the details of the heads of municipalities' departments and 58% provide municipality's organization chart. 46% of municipalities provide some kind of document related to organization's e-Government

strategy, 39% of them provide information related to citizen's right to access government data and finally only 12% of municipalities post a policy for the open government data (Figure 3).

3.4 Content Provision

The average value for the Content criterion is 65.8%, the highest performance between the five criteria. No municipality recorded low performance (Low level group), only twelve (12) municipalities perform at the medium level, thirty-eight (38) at the high level and twenty-four (24) at the very high level.

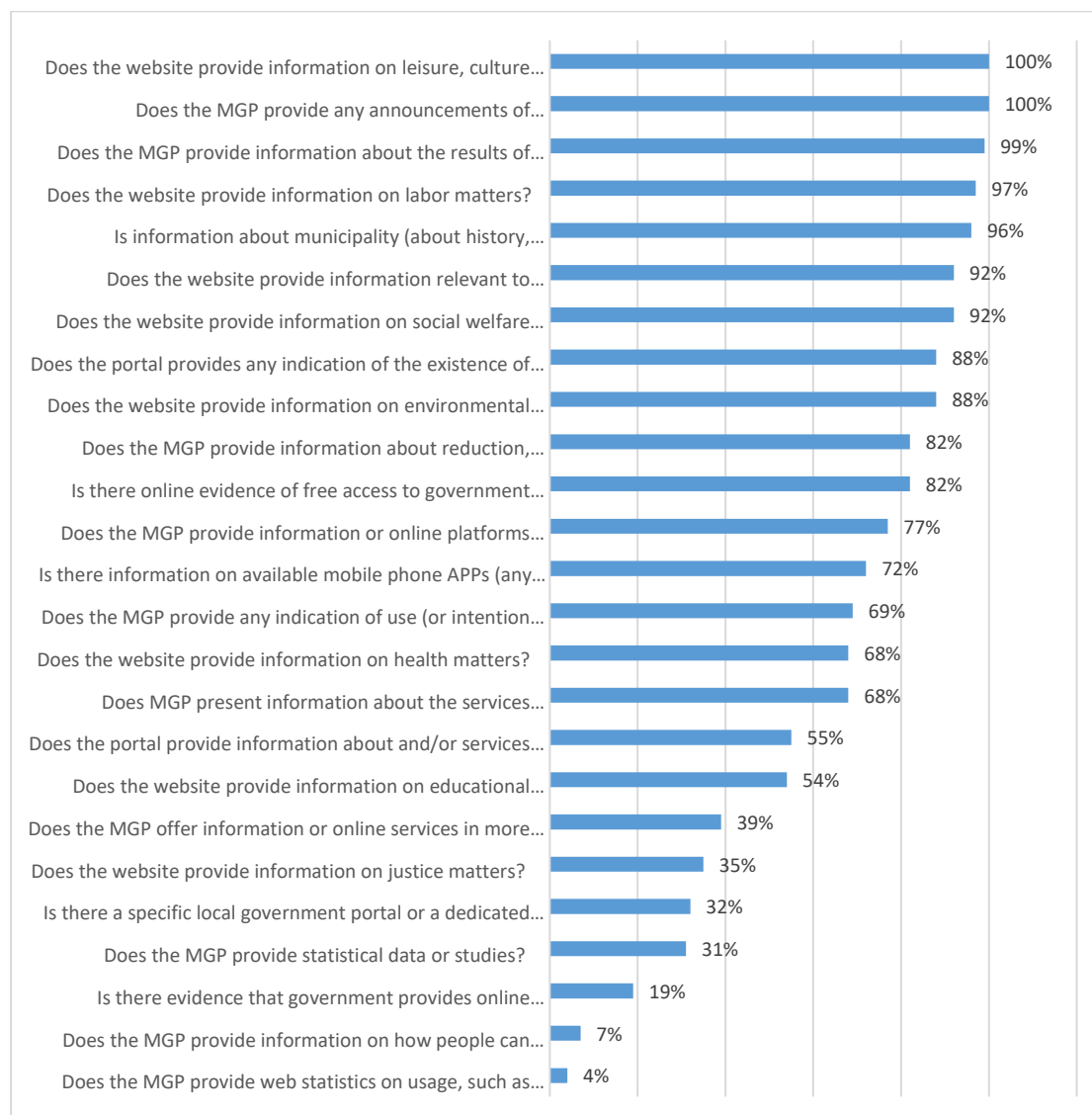


Figure 4: Content provision indicators (percentage of cities that satisfy the indicator)

The indicators providing information related to sport, culture and recreation and providing notices of upcoming tenders/procurements are fully satisfied by Greek municipalities. The announcement of the results of the various procurements/tenders are satisfied by 99% of the municipalities. 97% of municipalities provide information on employment issues, 96% provide general information about the municipality, 92% of municipalities provide information related to vulnerable social groups and information on social welfare issues. 88% show evidence of the existence of "smart city" policies and information related to environmental issues. 82%

provide information on issues of recycling and "green" actions and at the same time provide citizens with free access to electronic government services from community centres, libraries or free WiFi. 77% provide information on road safety, 72% support apps suitable for mobile phone devices and 69% show strong evidence for the use of new technologies such as blockchain, IoT, AI. 68% of the considered websites have information about health and the services they provide as an organization. The indicator of public transport is met by 55% of the municipalities, while the indicator of providing information related to education at all levels, by 54% of the websites. Only 39% of the municipalities provide the content in more than one language, while the percentage of municipalities that provide the possibility of electronic appeal or legal mediation is equally low, with this percentage not exceeding 35%. 32% is the percentage of municipalities on providing specialized information regarding COVID-19. Only 31% of the municipalities post statistical studies or surveys on the website and 19% provide digital services in collaboration with civil society. 7% of the websites provide the possibility of receiving updates and alerts related to natural phenomena. Finally, 4% of the municipalities provide traffic statistics (Figure 4).

3.5 Services Provision

Services provision criterion has the lowest performance among the 5 LOSI criteria. In particular, almost half of the municipalities, i.e. thirty-one (31) recorded low level performance in the individual indicators, forty (40) municipalities middle level, only three (3) high level performance and none scored at the very high level. The indicators' average value is 34.31%. It is noteworthy that none municipality meets five (5) of the eighteen (18) indicators, that of electronic payment of energy bills, business tax, vehicle declaration, application for residence permit and driver's license. All of these services are not provided at local level in Greece. However, these indicators were evaluated normally, as defined by the LOSI methodology, and we confirmed that they are indeed not provided.

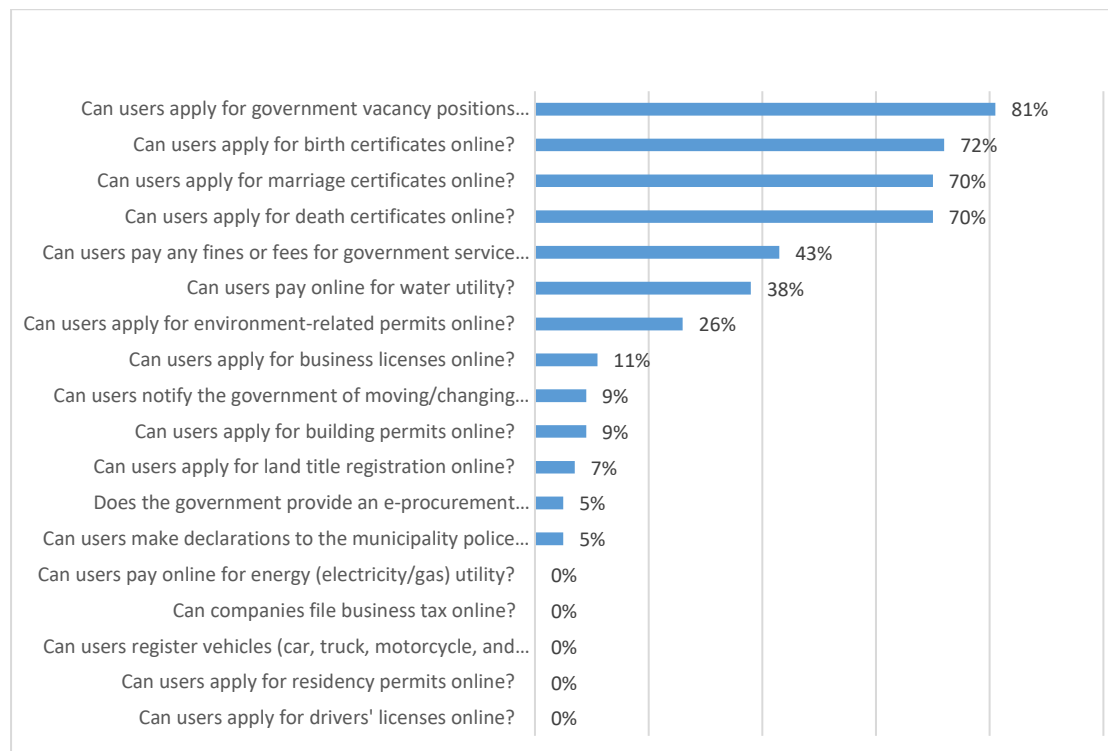


Figure 5. Services provision indicators (percentage of cities that satisfy the indicator)

Online application for vacancies is the indicator with the best performance (81%). The possibility of a birth certificate online application is provided by 72% of the websites, while online marriage and death certificates are provided by 70% of municipalities. 43% of the municipalities allow the electronic payment of taxes or fines, 38% the payment of water bills and in 26% of websites, users can apply for permits related to environmental issues. Only 11% of websites provide the possibility of submitting an electronic application for business license, while online building permit application and online residential address change notification are provided by 9% of the municipalities. Online land titles registration is provided by 7% and e-procurement platform and online police declaration are provided by 5% of the municipalities (Figure 5).

This specific criterion records the lowest performance overall and it is noteworthy that no indicator gathers the maximum score, while at the same time there are seven indicators that recorded a significantly low performance, below 30%.

3.6 Participation and Engagement

Participation and Engagement criterion reflects participatory democracy possibilities within the boundaries of a municipality. The indicators' average sample of this criterion is 58.5%. Only four (4) municipalities are ranked in the low level of maturity, seventeen (17) in the medium level, forty-seven (47) in the high level and six (6) in the very high level.

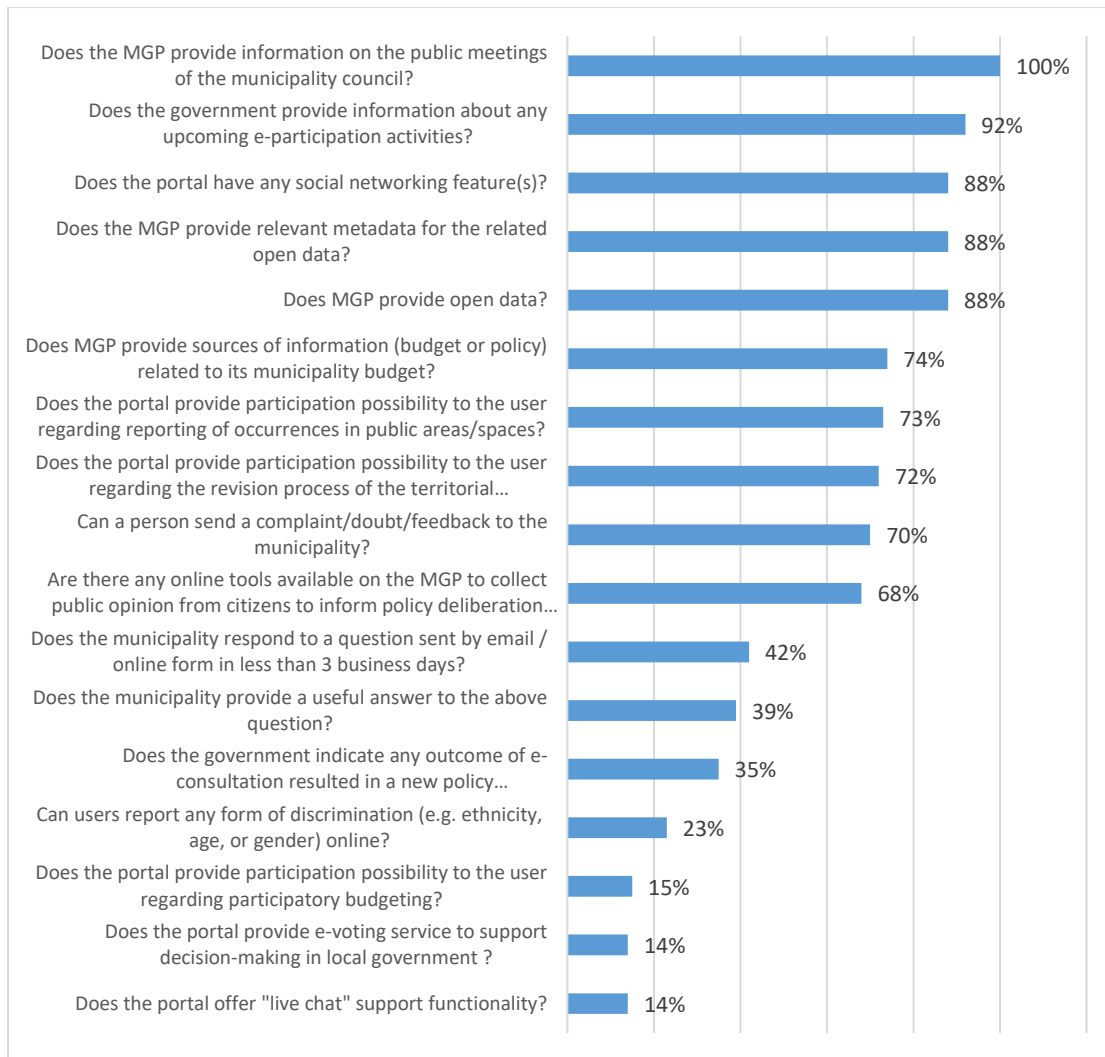


Figure 6. Participation and Engagement indicators (percentage of cities that satisfy the indicator)

All municipalities providing information on the public meetings of the municipal council. 92% of the municipalities provide information about the upcoming consultations, while 88% of them use social media, publish open data and the relative metadata of them. 74% of the municipalities post their financial data at the website, 73% of them provide the possibility of online reporting of various incidents and 72% participate in the formulation of policies related to the management of public municipal land. 70% support the submission of complaints and 68% provide online tools to gather public opinion. 42% responded within three working days to a query sent via an online form or email and 39% gave a useful response. Despite the high rate of information provision about consultations, only 35% of the municipalities publish the results of these actions. 23% of the websites offer the possibility to report any form of discrimination related to gender, age, etc. Participatory budgeting is only offered by 15% of the municipalities, while 14% provide the possibility of digital voting and the digital assistant to support the citizens (Figure 6).

3.7 Technology

The average performance of this criterion is 58% (4th among the five criteria) and includes eighteen (18) indicators.

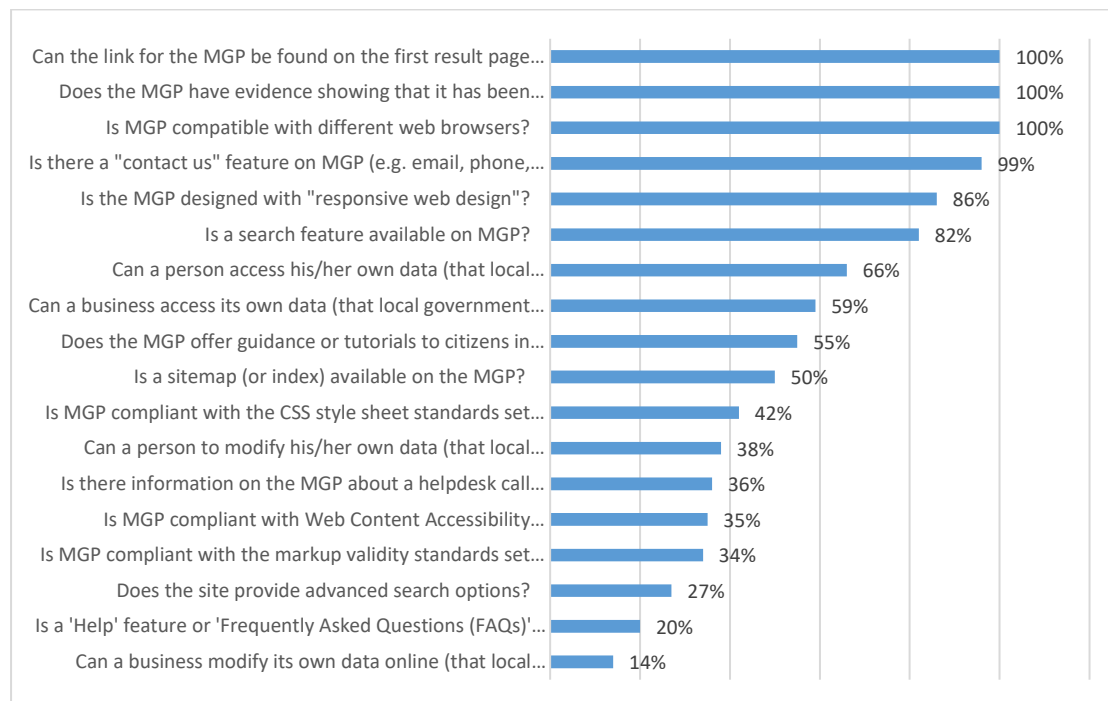


Figure 7. Technology indicators (percentage of cities that satisfy the indicator)

All websites can be found on the first page of search engine results (Google, Bing and Yahoo), show evidence of having been updated in the last month and are compatible with different web browsers (Chrome, Safari, Firefox). 99% of them provide contact information such as phone, address, email, etc. 86% of the websites are responsive in mobile navigation, and 82% of them provide search possibility. Only 27% of the websites provide advanced search options. A citizen can access the data maintained by the municipality in 66% of the websites and in only 38% of them the user can modify her/his data online. Businesses can access their data in 59% of the municipalities and only in 14% of them can modify their data. 55% of websites offer some type of guidance to users regarding the use of digital services. Half of websites provide an index or sitemap, 42% are compliant with W3C CSS standards, 35% are compliant with WCAG2.0 guidelines, and 34% with W3C markup validity standards. 36% of municipalities support citizens through helpdesk and 20% of them provide a section with frequently asked questions (Figure 7).

3.8 Results by Municipality

The number of indicators satisfied by each municipality and their LOSI scores are presented below (Table 1).

Table 1. Municipalities' LOSI scores

Municipality	TEC	SP	IF	EP	CP	Total (86)	LOSI Score	Rank	LOSI Group
Municipality of Patra	16	9	7	12	21	65	0.77	1	Very High
Municipality of Kalamata	12	7	8	14	22	63	0.74	2	High
Municipality of Heraklion	11	10	9	10	23	63	0.72	3	High
Municipality of Piraeus	12	7	7	11	22	59	0.70	4	High
Municipality of Chania	13	9	7	11	19	59	0.70	4	High
Municipality of Thessaloniki	13	6	8	10	21	58	0.69	5	High
Municipality of Larissa	12	6	8	10	23	59	0.68	6	High
Municipality of Kavala	12	5	8	14	19	58	0.67	7	High
Municipality of Xanthi	13	6	7	12	20	58	0.67	7	High
Municipality of Kallithea	12	6	7	13	20	58	0.67	7	High
Municipality of Korinthos	15	6	8	11	18	58	0.67	7	High
Municipality of Lamia	15	8	6	11	17	57	0.66	8	High
Municipality of Salamina	13	4	7	12	21	57	0.66	8	High
Municipality of Kos	13	7	8	9	19	56	0.64	9	High
Municipality of Rhodes	11	6	5	11	22	55	0.64	9	High
Municipality of Drama	13	4	6	10	20	53	0.64	9	High
Municipality of Corfu	14	6	7	9	19	55	0.63	10	High
Municipality of Rethymno	14	8	6	7	19	54	0.62	11	High
Municipality of Peristeri	10	6	6	11	20	53	0.61	12	High
Municipality of Acharnes	11	6	6	11	19	53	0.61	12	High
Municipality of Trikala	12	3	6	13	17	51	0.61	12	High
Municipality of Agrinio	12	5	7	9	18	51	0.61	12	High
Municipality of Athens	10	8	6	7	20	51	0.61	12	High
Municipality of Chalkida	12	2	6	12	20	52	0.60	13	High
Municipality of Mykonos	12	6	5	11	18	52	0.60	13	High
Municipality of Agios Nikolaos	9	6	6	9	22	52	0.60	13	High
Municipality of Mytilene	12	7	7	10	15	51	0.59	14	High
Municipality of Delfoi	11	5	6	11	16	49	0.59	14	High
Municipality of Serres	9	5	6	12	18	50	0.57	15	High
Municipality of Kozani	11	5	6	11	17	50	0.57	15	High
Municipality of Volos	8	6	7	12	17	50	0.57	15	High
Municipality of Syros-Ermoupolis	9	6	5	13	17	50	0.57	15	High
Municipality of Igoumenitsa	10	5	8	10	15	48	0.57	15	High
Municipality of Fyli	11	4	4	10	19	48	0.57	15	High
Municipality of Lefkada	11	3	6	11	18	49	0.56	15	High
Municipality of Chios	12	6	7	10	14	49	0.56	16	High
Municipality of Veria	13	5	6	8	16	48	0.55	16	High
Municipality of Arta	10	6	7	10	15	48	0.55	17	High
Municipality of Thira	12	6	7	9	14	48	0.55	17	High
Municipality of Naxos	9	6	6	9	18	48	0.55	17	High
Municipality of Thiva	9	5	5	10	16	45	0.55	17	High
Municipality of Nea Propontida	7	5	7	12	16	47	0.54	18	High
Municipality of Ioannina	6	5	8	11	17	47	0.54	18	High
Municipality of Chalandri	9	0	6	13	19	47	0.54	18	High

Municipality	TEC	SP	IF	EP	CP	Total (86)	LOSI Score	Rank	LOSI Group
Municipality of East Samos	13	6	4	8	16	47	0.54	18	High
Municipality of Karditsa	10	6	5	8	17	46	0.53	19	High
Municipality of Argostoli	13	4	5	10	13	45	0.52	20	High
Municipality of Kastoria	8	5	7	10	13	43	0.52	20	High
Municipality of Pella	11	6	5	9	11	42	0.48	21	Middle
Municipality of Alexandroupolis	8	2	4	9	19	42	0.48	21	Middle
Municipality of Komotini	9	1	7	9	16	42	0.48	21	Middle
Municipality of Kilkis	12	5	6	8	11	42	0.48	21	Middle
Municipality of Katerini	9	1	7	10	15	42	0.48	21	Middle
Municipality of Tripoli	8	1	6	9	16	40	0.46	22	Middle
Municipality of Pyrgos	8	1	3	8	18	38	0.46	22	Middle
Municipality of Preveza	9	1	5	11	13	39	0.45	23	Middle
Municipality of Limnos	9	2	5	7	16	39	0.45	23	Middle
Municipality of Kea	9	3	5	7	14	38	0.44	24	Middle
Municipality of Sparti	8	1	3	11	14	37	0.43	25	Middle
Municipality of Ikaria	10	4	3	6	14	37	0.43	25	Middle
Municipality of Kalymnos	8	1	3	9	15	36	0.41	26	Middle
Municipality of Grevena	6	5	4	7	12	34	0.41	26	Middle
Municipality of Karpenissi	9	4	5	4	13	35	0.40	27	Middle
Municipality of Argos-Mykines	9	3	3	7	13	35	0.40	27	Middle
Municipality of Paros	8	0	5	5	17	35	0.40	27	Middle
Municipality of Zakynthos	11	4	4	3	11	33	0.38	28	Middle
Municipality of Milos	9	1	3	9	11	33	0.38	28	Middle
Municipality of Karpathos	8	1	5	5	12	31	0.38	28	Middle
Municipality of Tinos	7	3	3	6	12	31	0.36	29	Middle
Municipality of Florina	11	4	1	3	11	30	0.34	30	Middle
Municipality of Skiathos	9	1	3	7	9	29	0.33	31	Middle
Municipality of Andros	6	1	3	7	11	28	0.32	32	Middle
Municipality of Thassos	6	1	3	6	11	27	0.31	33	Middle
Municipality of Ithaki	9	1	2	2	8	22	0.25	34	Middle

3.9 Results Analysis

The average value of the LOSI, in 74 Municipalities is 0.5537. Greek Municipalities fall short compared with the European LOSI average. Except one (1) municipality (Very High level group), Greek municipalities score at medium and high group levels. Twenty-six (26) municipalities, score in the Middle level group and forty-seven (47) municipalities score in the High level group.

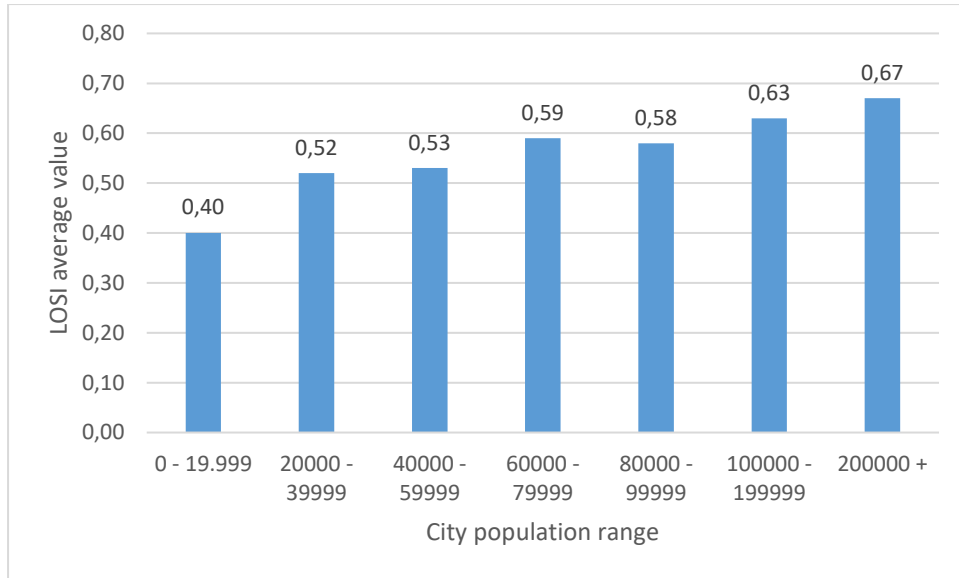


Figure 8. Average LOSI values by municipality population size

Municipalities have been classified into seven groups according to their population and the average LOSI value for each group has been calculated (Figure 8). Due to the wide range of variation of the populations (Annex Table 6), of the seventy-four municipalities of the country, the clustering has been done in groups of 20.000 in ascending order for the first five groups, where sixty-one (61) Municipalities are classified. The smallest municipality in terms of population is that of Ithaca (island), which consists of 2.862 permanent residents, while the most populous municipality of the first five groups is the municipality of Kallithea with a permanent population of 97.616 inhabitants. In the next category, (100.000 to 199.999), there are ten (10) municipalities (Heraklion, Chania, Piraeus, Larissa, Rhodes, Peristeri, Acharnes, Chalkida, Volos and Ioannina). The last category (200.000 +) includes the three most populous in the country, the municipalities of Athens, Thessaloniki and Patras. It follows that the larger municipality's population the better its LOSI performance, with a small stagnation in the group of 80.000 to 99.999.

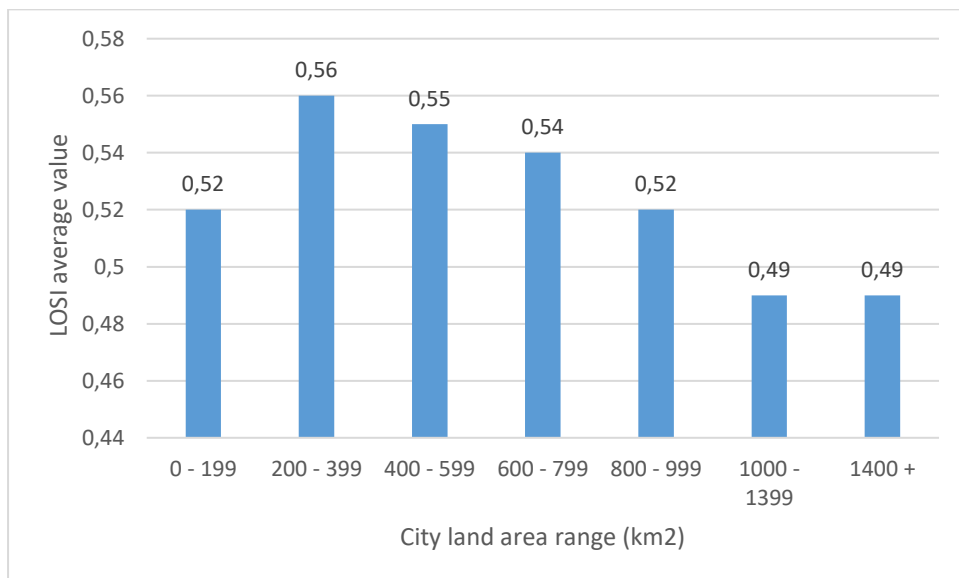


Figure 9. Average LOSI values by municipality land area (km2)

The performances of the Municipalities, in the four maturity levels of the LOSI index (low, medium, high, very high), were also analysed in terms of the area of the Municipalities, in square kilometres (km²) (Figure 9). The sample was divided into seven different groups, depending on the area. In the first group of municipalities, with an area of up to 199 km², the average value of the LOSI index was calculated equal to 0.52. In the second group with an area of 200 to 399 km², the average value was found to be equal to 0.56. This group has the highest average value, as out of the total of 18 municipalities, only 3 island municipalities have a negative effect on the average value of the index, the municipality of Karpathos with 0.36, the municipality of Andros with 0.32 and the municipality of Thassos with 0.31. This group also includes the municipalities of Patras (0.77) and Heraklion (0.72), which belong to the top five of the best ranking. In the next group (400 – 599 km²) the average value is equal to 0.55. Slightly lower (0.54) in the (600 – 799 km²) group and 0.52 in the (800 – 999 km²) group. There is a noticeable drop (0.024) in the mean value in the next group (1000 – 1399 km²), with a mean value equal to 0.49 and same performance (0.49) in the last group from 1.400 km² and above.

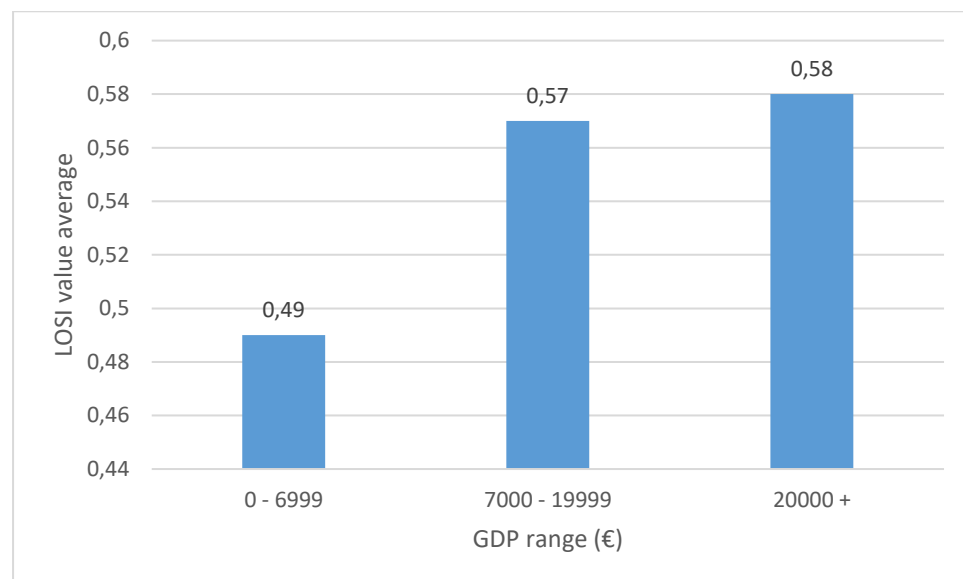


Figure 10. The average Gross Domestic Product (GDP), in euros, for the four LOSI level groups

The average Gross Domestic Product (GDP), in euros, for the three LOSI level groups, identified in the study, has been calculated (Figure 10). Municipalities sample was divided into 3 groups. The first group included 37 municipalities with a regional GDP of up to €6.999, where the average value was calculated as 0.49. All island municipalities except the municipality of Skiathos and the municipality of Salamina belong to this group. In particular, it is made up of the Regions of North and South Aegean, Western Macedonia, Epirus, Eastern Macedonia-Thrace and the Ionian Islands. In the next group, with regional GDP from €7.000 to €19.999, the average value of the LOSI index was found to be equal to 0.57. It includes the Regions of Western Greece, Peloponnese, Crete, Central Greece and Thessaly. In the last group, with a Regional GDP of 20.000 and above, the average LOSI value was found to be €0.58. This group includes the Regions of Attica and Central Macedonia.

In conclusion, from the statistical analysis of the data, there is a relation of the LOSI index with the GDP of the Region of the municipalities. There is a proportional relationship between the Region's GDP and the LOSI index, as the higher the GDP, the higher the average value of the LOSI index. However, it is worth noting that the municipality of Patra, which has the best performance (0.77), belongs to the second group with a Regional GDP of €7.538. We could say that the Municipality of Patras managed to achieve the greatest performance, with the fewest resources.

3.10 Regional Performance

The phenomenon of the Attica and Crete regions is noteworthy, as all municipalities, without exception, are ranked at the high-level group (Figure 11). The former consists of eight municipalities and the latter of four.

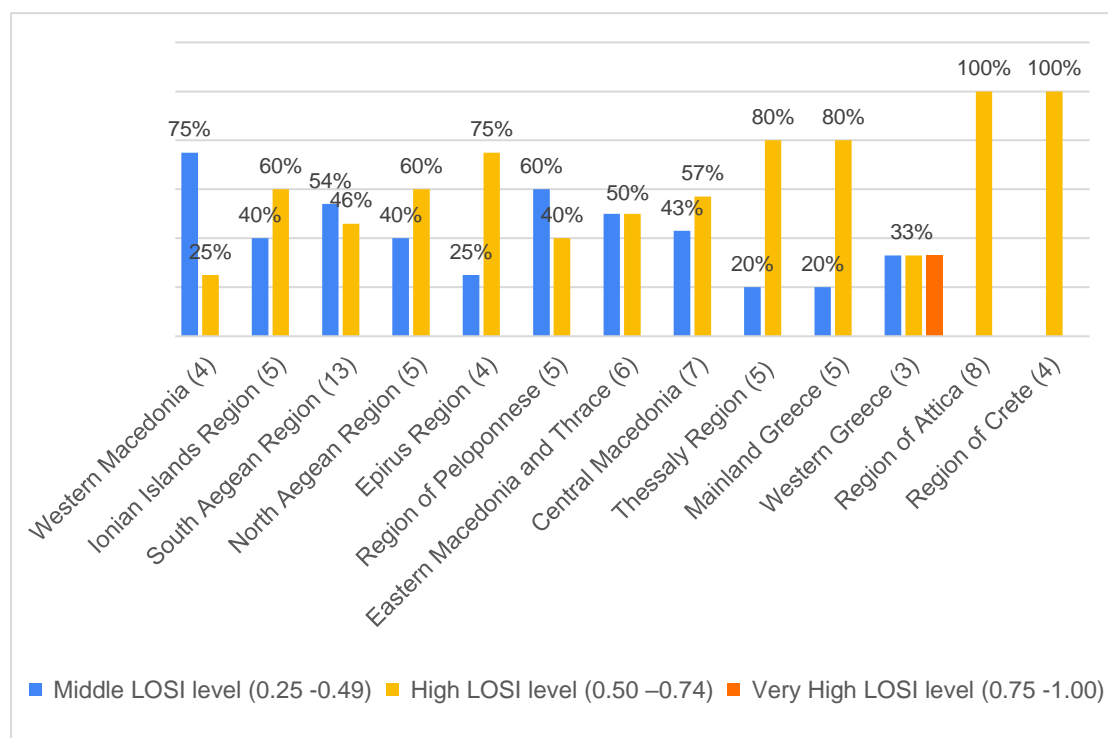


Figure 11. Regional performance per LOSI level group

In the next group we have regions where the majority of the municipalities belong to the high-level group. In Ionian Islands and North Aegean regions, out of a total of five Municipalities, two are classified at the medium level and the remaining three at the high-level group. In Thessaly and Central Greece regions, 4 out of 5 municipalities are ranked at the high-level group, while only one municipality is at the medium level group. Same picture in the Epirus region, 3 out of 4 municipalities belong at the high-level group and only one at the medium level one. In the region of Central Macedonia, 4 out of 7 municipalities are ranked at the high-level group and three municipalities at the medium level group.

Eastern Macedonia, Thrace and Western Greece regions show an equal distribution. In region of Eastern Macedonia 3 out of 6 municipalities are classified at the high-level group and the remaining three at the medium level group. In Western Greece regions one municipality is in the middle level group, one in the high-level group and one in the very high one. Similar

picture in South Aegean region where seven municipalities are ranked at the medium level group and six at the high level one.

In Peloponnese region, 3 out of 5 Municipalities belong at the medium level group and two at the high level one. Region of Western Macedonia, with four Municipalities, holds the record for the lowest performance since 3 out of 4 Municipalities are classified in the medium level group and one municipality in the high-level group.

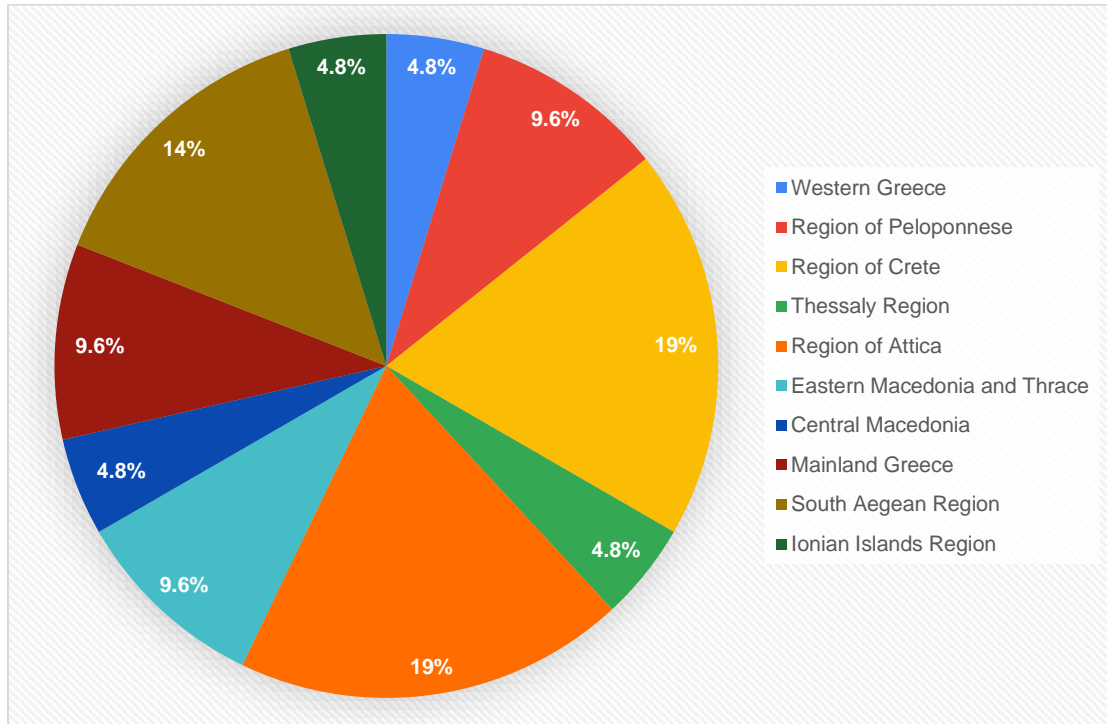


Figure 12. LOSI top 10 municipalities' distribution per region

19% percent of the top 10 municipalities belong in Attica region and 19% in Crete region. South Aegean region has 14% of top 10 municipalities, followed by the regions of Peloponnese, Eastern Macedonia-Thrace and Sterea Ellada with 9.6% and last the regions of Western Greece, Thessaly, Central Macedonia and the Ionian Islands, with a percentage of 4.8% of the top 10 municipalities (Figure 12).

4. Local Electronic Government in Greece

4.1 Adaptation of the method to the Greek Reality

As has been mentioned in the previous chapter, there are five indicators which are not applicable in the context of local government administration and were assessed with zero. The specific indicators were not excluded from the overall assessment, as they could be provided by redirection link to the respective government page responsible for the relevant issues. In particular, these are the indicators:

1. #254 Can users apply for drivers' licenses online?
2. #255 Can users apply for building permits online?
3. #264 Can users register vehicles (car, truck, motorcycle, and others) online?
4. #268 Can companies file business tax online?
5. #287 Can users pay online for energy (electricity/gas) utility?

Only 34 out of 74 MGPs have an e-Government strategy or an action plan for e-Government or an equivalent document. The planning of goals and commitment to their implementation will help the municipalities to achieve the digital transformation of the services provided. In this way, it will be possible to align the overall maturity (national, local, regional) of the e-government assessment indicators of the country.

Research institutes, universities, associations specialized in ICT and digital transformation, could contribute positively to the advancement of digital public services, both during the policy formulation stage, as well as in their implementation and evaluation. Municipal authorities should use academia and research community's expertise and knowledge.

Municipalities' IT departments face serious deficiencies and weaknesses in specialized staff. There are departments that according to national human resources data face staffing weaknesses and lack of training in new technologies. An additional problem is the insufficient absorption of European and national funding for supporting local e-Government development programs.

For easier adaptation to LOSI guidelines, an additional research (e.g. with a questionnaire to the municipalities and to the responsible officials involved in e-Government) would be beneficial (e.g. LGQ). Research has shown that Municipalities respond to such actions with high participation rates (Sarantis et al., 2022)².

Finally, central management of the municipalities' e-Government policies could be beneficial, following a national aligned policy. Mandatory application of key e-Government enablers and suggestions of additional options could be used.

² Sarantis, D., Soares, D., Susar, D., & Aquaro, V. (2022, October). Local e-Government Development: Results of an international survey. In Proceedings of the 15th International Conference on Theory and Practice of Electronic Governance (pp. 391-396), available at: <https://dl.acm.org/doi/abs/10.1145/3560107.3560167>

4.2 Comments on LOSI indicators

In this section we provide qualitative analysis of Greek municipalities performance per indicator (Greek translation for the indicator is provided). The most interesting findings of the present research are listed, which is fuelled by the diversity of the structure, content, form and the political will of the administration of each Municipality. Specifically, by indicator:

- #281 Is there a Municipality Government Portal (MGP)? - Υπάρχει δημοτική κυβερνητική πύλη (MGP);

All (74) Municipalities have an official website. Fifteen (15) websites have a 'gov.gr' suffix while two (2) (Tinos and Naxos) have an 'eu' suffix . Three (3) websites' names do not refer at all or only slightly to the name of the municipality. The municipality of Pella (Giannitsa.gr), the municipality of Argostoli (kefallonia.gov.gr) and the municipality of Argos-Mycenae (newargos.gr).

- #283 Is there information on available mobile phone APPs (any kind) on the MGP? - Υπάρχουν πληροφορίες για τις διαθέσιμες εφαρμογές κινητών τηλεφώνων (οποιοδήποτε είδους) στο MGP;

53 out of 74 Municipalities have mobile phone applications available. However, it was observed that 9 Municipalities, while providing certain services through the application, do not provide them at the same time from the website (Municipalities of Pella, Xanthi, Chalandri, Athens, Kea, Lefkada, Karpenisi, Katerini and Delphi).

- #250 Does the municipality respond to a question sent by email/online form in less than 3 business days? - Απαντά ο δήμος σε ερώτηση που αποστέλλεται μέσω ηλεκτρονικού ταχυδρομείου/ηλεκτρονικής φόρμας σε λιγότερο από 3 εργάσιμες ημέρες;

31 municipalities responded to the message sent via email or online contact form, within three working days. Of these, two (Rhodes and Kalamata) did not provide an informative answer, as they referred to telephone numbers for further investigation. At the same time, the municipalities of Thessaloniki and Acharnes, turned the process of simple information into a highly bureaucratic and energy-consuming one, because they compiled a special file (pdf) which also had a protocol number. Municipality of Volos response was positive, whose employee answered the email message and at the same time called the number given in the contact form to resolve any questions or offer additional help. An employee of the municipality of Thiva (revenue department) also called, investigating the possibility of remote service. All without exception provided informative answers, short and concise. It is worth noting that there was no municipality that responded beyond the period of three working days (i.e. all the negative assessments of the specific indicators resulted from non-response and not from a response beyond the time limit of the indicator).

- #204 Is the MGP designed with "responsive web design"? - Είναι ο δικτυακός τόπος (ΔΤ) σχεδιασμένος με τρόπο προσαρμόσιμο σε ηλεκτρονικές συσκευές διαφορετικών τύπων;

Navigation through mobile devices, for the majority of websites, is sufficiently functional. However, in this research, some elements were observed that prevented unhindered access and navigation. In fact, the structure of 3 websites do not help easy navigation, since all

information is loaded on the home page, which in some cases goes back to 2016, resulting in the loss of all other information such as the field search, or contact information is not clearly visible and in a convenient place. In addition, two websites' design is extremely awkward to navigate, as there are four different categories/topics on the main page and a return to the home page is required. Consequently, the process becomes time-consuming and prevents the user from browsing.

- #212 Does the MGP offer information or online services in more than one language?
- Προσφέρει ο ΔΤ πληροφορίες ή ηλεκτρονικές υπηρεσίες σε περισσότερες από μία γλώσσες;

In more than half of the websites, there is a distinction on the main page according to the status of the user (e.g. citizen, visitor, business). It was observed that municipalities give greater importance to the tourist promotion of their place, providing the content of the visitors' page in a second foreign language, usually English, while at the same time they do not provide the entire website content in another language than Greek. Exceptions are the municipality of Agios Nikolaos of Crete with seven additional languages, the municipality of Nea Propontida which provides, with great success, all the content of the website in six languages besides Greek and the municipality of Andros with three languages throughout the website and another two languages with instructions for visitors (Italian and Russian) in pdf format.

- #218 Does the MGP provide information on how people can receive updates or subscribe to notifications to keep updated about weather/natural disaster alerts (air quality, flooding, earthquake alert, etc.)? - Παρέχει ο ΔΤ πληροφορίες σχετικά με τον τρόπο με τον οποίο οι πολίτες μπορούν να λαμβάνουν ενημερώσεις ή να εγγραφούν σε ειδοποιήσεις για να ενημερώνονται σχετικά με συναγερμούς για καιρικές συνθήκες/φυσικές καταστροφές (ποιότητα αέρα, πλημμύρες, σεισμός κ.λπ.);

Only four municipalities provide the possibility of extreme weather phenomena alert mechanism, while three municipalities provide an alert mechanism through an application.

- #223 Is there evidence that government provides online services in partnership with civil society? - Υπάρχουν αποδείξεις ότι η κυβέρνηση παρέχει ηλεκτρονικές υπηρεσίες σε συνεργασία με την κοινωνία των πολιτών;

The specific indicator shows a reduced response from the largest municipalities of the country. However, there are few actions such as that of Athens municipality ("Adopt your city"), which offers the possibility of adopting a park, square, street, playground, entire neighbourhood, etc. with the aim of improving the infrastructure and the livelihood of the residents of the municipality.

- #226 Does the website provide information on health matters? - Παρέχει ο ΔΤ πληροφορίες για θέματα υγείας;

The Health Service Centres have been established in most of the municipalities. However, what is worth mentioning are the telecare health services of the municipality of Trikala. Telecare and telemedicine infrastructure has been created to support the elderly, people with chronic diseases and the mentally ill.

- #233 Does the website provide information on labor matters? - Παρέχει ο ΔΤ πληροφορίες για εργασιακά θέματα;

Information on employment issues is offered by 72 out of 74 municipalities. Most municipalities offer vacancies for fixed-term contracts. However, some municipalities provide a full employment service, such as the municipalities of Thessaloniki, Thassos, Thiva and Piraeus, which offer all the positions of the municipality (also from private companies) on a special sub webpage, as well as the municipality of Nea Propontida which offers similar service through its Facebook page. A special case is the municipality of Corfu, which has invested in a human resources platform in the tourism sector, exclusively and at the same time offers fixed term contract positions according to the needs of the municipality.

- #235 Is there an Open Government data policy available online? – Υπάρχει πολιτική ανοικτών κυβερνητικών δεδομένων διαθέσιμη στο διαδίκτυο;

65 out of 74 municipalities offer open data, but only 9 out of 74 post a relevant open data policy.

- #236 Does MGP provide open data? – Παρέχει ο ΔΤ ανοικτά δεδομένα;

54 out of 74 municipalities offer open data through Diavgia (Clarity) program. 7 out of 74 municipalities offer open data of various types and 4 out of 74 municipalities provide open urban planning data. That is, 65 out of 74 municipalities offer open data.

- #245 Is there any kind of authentication required to access online services and restricted access areas on the MGP (e.g. digital ID; login and password; mobile key)? – Απαιτείται κάποιου είδους έλεγχος ταυτότητας για την πρόσβαση σε διαδικτυακές υπηρεσίες και περιοχές περιορισμένης πρόσβασης στον ΔΤ (π.χ. ψηφιακή ταυτότητα, σύνδεση και κωδικός πρόσβασης, κλειδί κινητού τηλεφώνου);

Users are authenticated in websites through three ways: a) through registration with username and password, b) through national online tax system codes and c) through social media. In the first and last case, the possibility of electronic payment and entry to the gov.gr portal is not provided, but the rest of the municipality portal services are provided.

- #266 Can users apply for government vacancy positions online? – Μπορούν οι χρήστες να υποβάλουν ηλεκτρονικά αίτηση για κενές κυβερνητικές θέσεις;

Online job vacancy application possibility is provided by 60 out of 74 municipalities. 93.3% (56) of them provide the possibility to submit applications via email, while the remaining 6.7% (4) of them, (Trikala, Karditsa, Volos and Serres) offer an electronic application form for recruitment of seasonal and permanent staff of the organizations.

- #273 Does the portal have any social networking feature(s)? – Διαθέτει η πύλη λειτουργίες 25οινωνικής δικτύωσης;

65 out of 74 municipalities use social networks for the tourism promotion of their region, but also for informing about their actions. The preferred social networks (in order of preference) are Facebook (86.49%), Youtube (60.81%), Twitter (52.70%), Instagram (37.84%), Pinterest (6.76%), LinkedIn (4.05%), Flickr (4.05%), Viber (2.70%) and Vimeo (1.35%). Twelve websites use only one social network, thirty-three websites two to three networks, nineteen four to five ones and only one website uses six networks (Annex Table 7).

- #219 Does MGP provide sources of information (budget or policy) related to its municipality budget? – Παρέχει ο ΔΤ πηγές πληροφοριών (προϋπολογισμού ή πολιτικής) σχετικά με τον προϋπολογισμό του δήμου της;

Some websites provide financial information approximately older than 2 years. Some municipalities have not updated this section for more than 10 years.

- #259 Can users apply for birth certificates online? – Μπορούν οι χρήστες να υποβάλουν ηλεκτρονικά αίτηση για πιστοποιητικά γέννησης;
- #260 Can users apply for death certificates online? – Μπορούν οι χρήστες να υποβάλουν ηλεκτρονικά αίτηση για πιστοποιητικά θανάτου;
- #261 Can users apply for marriage certificates online? – Μπορούν οι χρήστες να υποβάλουν ηλεκτρονική αίτηση για πιστοποιητικά γάμου;

Most of municipalities provide online issuance of marriage certificate, birth certificate and death certificate using and redirecting to the national government portal gov.gr. Only 9 out of 74 municipalities do not provide this option (Kilkis, Zakynthos, Ithaca, Argos-Mycenae, Limnos, Mykonos, Paros, Agios Nikolaos and Rethymno).

4.3 Good Practices in Greek local government

Digitization of public services is in progress in Greek municipalities. Covid 19 pandemic crisis gave a boost to Greek public administration towards online service provision to citizens and businesses. Civil servants, generally, become advocate of digitation efforts since they recognize the benefits of it. The efficiency and effectiveness of the digital services provision is reflected in the satisfaction of citizens and the savings for all stakeholders involved in the processes. The measurement of quality and maturity of services is an imperative both for the assessment of what has been done and for the further improvement. The good practices of Greek municipalities, as recorded by this study, are listed below:

- Appointment of an e-Government deputy mayor responsible for digital policy, as established by the municipality of Veria. According to the study of Digital Governance in Local Government (Charalampidis et al. 2022)³, citizens prefer, at a rate of 66%, electronic service provision over physical one. Establishing in municipalities an e-Government deputy mayor position could contribute towards this direction.
- An independent office of transparency, as it operates in the municipality of Serres, could ensure transparency between the Municipality and third parties, through the implementation of appropriate procedures and applications.
- Municipality of Serres has a special webpage displaying information for city's freelancers and businesses, using an interactive map, while at the same time providing all kinds of information on indoor and outdoor trade, such as a map of the municipality's street markets.
- Municipality of Chalandri, provide information and statistics about municipality's projects and actions, allocated per policy, project, action, social group, field of application and the corresponding funds spent.

³ Charalambidis I., Lachana Z., Theocharopoulou X., Vogiatzis N., (03/2022), Digital Governance in Local Government, Institute of Local Government. Available at: [Μελέτη ITA Ψηφιακή Διακυβέρνηση στην TA 22.03.22-1.pdf \(ita.org.gr\)](https://ita.org.gr/Μελέτη_ITA_Ψηφιακή_Διακυβέρνηση_στην_TA_22.03.22-1.pdf),

- The municipality of Nea Propontida in Chalkidiki has an interactive map showing the public available defibrillators. Municipalities could provide information about first aid training seminars and availability of defibrillators in the municipality.
- Municipality of Kozani promotes the European Citizens' Initiative⁴, as unlike other municipalities, it provides full instructions, an analytical brochure and tools for a successful application of this initiative, with the aim of mobilizing citizens and increase their participation in policy formulation.
- Municipality of Arta has an online budget process. On this budget page, the citizen can monitor municipality's budget in a comparative way (use of graphs). In the same webpage, municipality mentions all the types of cards accepted by the municipality for payments.
- Municipality of Igoumenitsa gathers and provides all municipality's service regulations on a special subpage. It is the only municipality that provides all, without exception, service regulations.
- Municipality of Karditsa provides quarterly reports on budget execution and at the same time quarterly reports on the achievement of objectives. Municipality dedicates a subpage to its donors, quoting a few words about their background.
- Municipality of Trikala organizes telemedicine services to support vulnerable groups, as well as psychological support services for patients' caregivers. It supports citizens' participation, through the "Proposals" subpage, which deals with issues such as consultations, citizens' proposals, polls, questionnaires, participatory budget, after login using the national authentication system.
- Municipality of Lefkada offers, in e-books form, registry office historical data and census information (marriages, baptisms, deaths) as well as poems.
- Municipality of Chalkida, in collaboration with an urban non-profit organisation, implement the "Housing and Work for the Homeless" program, with the aim of the municipality's homeless residents social and work reintegration. Also, the Municipality, through a subpage, enables the citizens to learn the history of all the streets of their city, with the program "The History of your Street".
- Municipality of Chalandri has a subpage providing gymnastics instructions from home for young and old citizens. Experts offer training through recorded videos.
- Municipality of Kallithea offers online vocational orientation for young people who are still undecided about their career choices.
- Municipality of Rethymno offers an online platform named "School Request Management System", to save resources and time, but also to provide quick information and services about school units.
- Municipality of Alexandroupolis provides online entertainment for preschool and school-aged children, with puppet theatre, songs, fairy tales, experiments, constructions, cooking, etc.
- Municipality of Piraeus provides a Business Support Center with appropriate material and tools to support the development of a company.
- Municipality of Salamina offers virtual reality applications for the description and visualization of municipality's related historical events of, in collaboration with a non-governmental organization, named the Foundation of Greater Hellenism.

⁴ European Citizens' Initiative, Municipality of Kozani, available at:
<https://www.cityofkozani.gov.gr/europaiki-protovoulia-politon>

- Municipality of Kalamata posts online the policy regarding the operation of the video surveillance system in the municipality buildings.
- Municipality of Milos is running a campaign for the return of Aphrodite of Milos to her home, through the "Take Me Home" application and the collection of signatures. The above action demonstrates the existence of e-petitions in Greek local government.
- Municipality of Heraklion (Crete), provides free municipal bicycles to the citizens, by borrowing them from two predetermined pick-up-delivery points.
- Evaluation of services and of the entire municipality portal is provided by the municipality of Chania.

5. Conclusion

5.1 Suggestions for improving the LOSI method

The following proposals - additions concern services and possibilities that are mostly provided by Greek municipalities, but are not covered by LOSI indicators.

1. Addition of an indicator for scheduling an appointment for services that are not provided digitally (e-Appointment).
2. Addition of an indicator for scheduling a video conference appointment (remote service).
3. Addition of an indicator for voice search, for facilitation, time saving and convenience for people with difficulties or unfamiliarity with the keyboard.
4. Addition of an indicator for newsletter existence. Almost half of the municipalities have a newsletter (e.g. municipality of Chios is a good case).
5. Addition of an indicator for the existence of an online platform or application for volunteering (e.g. the provision of voluntary work or service for the benefit of society).
6. Addition of an indicator regarding the constructor of the site (if it was designed by a contractor or it was implemented self-supervised). This indicator will show the readiness to make changes at any time and moment and the saving of time and resources for the organization itself. The percentage of ICT specialists in Greece is low, as for 2024 it amounts to 2.5% of total employment, while the same percentage in the European Union amounts to 4.6%.
7. Addition of an indicator for the provision of instructions related to dealing with extreme weather phenomena (floods, fires, earthquakes, etc.), through written texts and videos. Instructions related to climate change must be integrated into the official municipality websites.
8. Addition of an indicator to provide open data related to the agricultural sector (e.g. farmers: weather, purchase prices of pesticides/fertilizers, sale prices to agricultural cooperatives/traders, compensation payments).
9. Addition of an indicator related to the structure of the municipality website, if access to Citizen/Visitor/Business is distinguished. Most Municipalities make a distinction entering on the main page.
10. Addition of an indicator for online monitoring of the municipal council (e.g. Youtube). This service is provided by several municipalities.
11. Addition of an indicator related to user authentication. In which ways the process is provided (e.g. username/password, social media, TAXIS Net or eID.AS, Google).
12. Addition of an indicator for online digital training of vulnerable groups to fight digital exclusion.
13. Addition of an indicator for online municipal newspaper in which citizens will be able to send ideas (participation), suggestions and learn the news immediately.
14. Addition of an indicator for online municipal radio so citizens can learn the latest news everywhere (car, bus etc.) and listen to complaints/observations/announcements.
15. Addition of origin of wealth for elected officials, for each financial year, for absolute transparency.
16. Adding an account of deed of the municipality authority's actions (goals-implementation, continuous updating).
17. Addition of an indicator for the assessment of the provided services of the MGP.

18. Addition of an indicator for the announcement of results per specific action (e.g. results for procurement, recruitment, contracts, not all results mixed).
19. Addition of an indicator for the existence of contact information with the Municipality's Data Protection Officer (DPO/Data Protection Officer).

5.2 Greek local e-Government status

Assessment data collection and processing of the largest municipality of each one of the regional units of Greece, lead to the average LOSI value of 0.5537 which belongs in high LOSI level group (0.50-0.74). It is worth noting that no website was rated at the low-level group and 62.2% of the municipalities were rated at the high level of the index. Only one municipality (Patra) scores, marginally (0.77) in very high-level group.

Based on official population census data of 2022, a proportional relationship appears between municipality's population and its LOSI value (small municipalities score worse than large ones). The geographical area (km²) of the municipalities shows an inverse proportional relationship with LOSI value (small municipalities score better than large ones). In addition, the financial data (GDP and GDP per capita of the region) show a proportional relationship with LOSI score, at least for the middle and high-level groups. However, because only one municipality is ranked in the very high-level group, it is not safe to make an overall assessment of the correlation of official financial data with LOSI value for this LOSI level group.

LOSI average value of the LOSI 2024 index (0.5537) is far from the national EGDI index of Greece, which is equal to 0.8455 and belongs to Very High (VH) EGDI group. Greek LOSI average values falls short compared to the European average of the LOSI index (0.8305), while the difference is smaller compared to the global average of LOSI index (0.6102).

5.3 Policy recommendations

Information collected during the assessment help to formulate relative recommendations. The Central Union of Municipalities of Greece (KEDE) could create a webpage and update it on a quarterly basis, with local government good practices. This will be a central point of dissemination and exchange of good practices to advance collaboration. Municipality of Trikala has applied twinning cities model with Amberg (Germany), Antiparos (Greece) and Tuscon (USA). Municipality of Larisa has applied twinning cities model with Chemnitz (Germany), Knoxville (USA) and Kos (Greece). A significant problem has been identified in online consultations and engagement, where a low level of citizen participation was observed. Only 26 out of 74 municipalities post consultation results in their portals. Improvement in this aspect would promote transparency and increase citizen's interest in public participation.

The digitization of services became an immediate necessity during the COVID-19 pandemic crisis and those municipalities that had the appropriate resources and means proceeded to transform the services provided. We believe that the good practices of the municipality of Patra will be the guide for their implementation at a Pan-Hellenic level, as was previously observed with the municipality of Trikala through the municipalities twinning initiatives. The "twinning" of municipalities at national and European level is a flexible tool for local governments based on long-term cooperation and exchange of good practices for two or more cities, on issues such as culture, sustainable development, solidarity, economic development, participation, services provided, etc. The importance of the assessment of local e-Government status, and especially the comparison with previous assessments it is expected to be proved highly constructive in the near future. What we keep as a guide is the:

- a) Consolidation of successful digitization initiatives during COVID crisis.
- b) Continuous and stable enrichment of the services provided.
- c) Recruitment of specialized personnel related to digital technologies application.
- d) Central guidance, monitoring and assessment of the design and implementation of municipalities' digitisation actions with the aim of simulating and using the overall e-Government maturity (national, local, regional) of the country's experience.
- e) Search for "help" from knowledge resources, such as universities, research institutes and e-Government specialists that can support municipal administrations.
- f) Redirection of non-provided services, to the corresponding government page responsible for the relevant matters.
- g) Extension of the evaluation of the LOSI index to all municipalities of Greece.

The administrations of the municipalities give the impression of randomness, regarding the choice of services provided through their website. The institution of decentralization works negatively in the field of e-government, as the reduced diffusion of policies from the central government and the sufficiency of resources for their implementation, makes the simulation of the digital maturity of all public organizations, at local and central level, marginal impossible.

Annex Tables

Annex Table 1. Institutional Framework indicators

Institutional Framework indicators (9)
#281 Is there a Municipality Government Portal (MGP)?
#213 Is there a municipal e-Government/Digital Government strategy or equivalent available online?
#215 Is information available on the MGP about the organizational structure or chart?
#216 Is any information available on the MGP regarding the names and titles of head of departments/functions?
#224 Does the MGP provide information on citizens' rights to access government information? (such as the Freedom of Information Act or Access to Information Act)
#234 Is there a privacy policy or statement available on the MGP?
#235 Is there an Open Government data policy available online?
#242 Does the MGP provide links to any local/regional/national government agencies?
#245 Is there any kind of authentication required to access online services and restricted access areas on the MGP (e.g., digital ID; login and password; mobile key)?

Annex Table 2. Content Provision indicators

Content Provision indicators (25)
#212 Does the MGP offer information or online services in more than ONE language?
#217 Is information about municipality (about history, demographics, geographical region, economy, tourism) available on the MGP?
#218 Does the MGP provide information on how people can receive updates or subscribe to notifications to keep updated about weather / natural disaster alerts (air quality, flooding, earthquake alert, etc.)?
#220 Does the MGP provide any announcements of forthcoming procurement/bidding processes?
#221 Does the MGP provide information about the results of any government procurement/bidding process?
#222 Does MGP present information about the services provided by the municipality?
#223 Is there evidence that government provides online services in partnership with civil society?
#225 Is there online evidence of free access to government online services through kiosks, community centres, post offices, libraries, public spaces or free WiFi?
#226 Does the website provide information on health matters?
#227 Does the website provide information on environmental matters?
#228 Does the website provide information on educational matters?
#229 Does the website provide information on social welfare matters?
#230 Does the website provide information on leisure, culture and sports matters?
#231 Does the website provide information relevant to vulnerable groups?
#232 Does the website provide information on justice matters?
#233 Does the website provide information on labor matters?
#238 Does the portal provides any indication of the existence of smart city initiatives or efforts in the municipality?
#239 Does the MGP provide any indication of use (or intention to use) of emergent technologies (block chain, artificial intelligence, IoT, etc.) by the municipality?
#243 Does the MGP provide statistical data or studies?
#282 Does the portal provide information about and/or services about public transportation (e.g., timetables, route maps, information about fees and payment)?
#283 Is there information on available mobile phone APPs (any kind) on the MGP?
#284 Does the MGP provide information about reduction, recycling, and reuse of waste?
#285 Does the MGP provide information or online platforms about road safety?
#289 Does the MGP provide web statistics on usage, such as new visits, total page views, average time on site, etc.?
#290 Is there a specific local government portal or a dedicated section addressing the COVID-19 pandemic?

Annex Table 3. Service Provision indicators

Service Provision indicators (18)
#253 Can users make declarations to the municipality police online?
#254 Can users apply for drivers' licenses online?
#255 Can users apply for building permits online?
#256 Can users apply for environment-related permits online?
#257 Can users apply for business licenses online?
#258 Can users apply for residency permits online?
#259 Can users apply for birth certificates online?
#260 Can users apply for death certificates online?
#261 Can users apply for marriage certificates online?
#262 Can users notify the government of moving/changing their address online?
#263 Can users apply for land title registration online?
#264 Can users register vehicles (car, truck, motorcycle, and others) online?
#265 Does the government provide an e-procurement platform for bidding processes/submission of tenders?
#266 Can users apply for government vacancy positions online?
#268 Can companies file business tax online?
#269 Can users pay any fines or fees for government service online?
#286 Can users pay online for water utility?
#287 Can users pay online for energy (electricity/gas) utility?

Annex Table 4. Participation and Engagement indicators

Participation and Engagement indicators (17)
#250 Does the municipality respond to a question sent by email / online form in less than 3 business days?
#252 Does the municipality provide a useful answer to the above question?
#219 Does MGP provide sources of information (budget or policy) related to its municipality budget?
#236 Does MGP provide open data?
#237 Does the MGP provide relevant metadata for the related open data?
#267 Can users report any form of discrimination (e.g., ethnicity, age, or gender) online?
#270 Does the portal offer "live chat" support functionality?
#271 Can a person send complaint/doubt/feedback to the municipality?
#272 Are there any online tools available on the MGP to collect public opinion from citizens to inform policy deliberation processes?
#273 Does the portal have any social networking feature(s)?
#274 Does the portal provide participation possibility to the user regarding reporting of occurrences in public areas/spaces?
#275 Does the portal provide participation possibility to the user regarding participatory budgeting?
#276 Does the portal provide participation possibility to the user regarding the revision process of the territorial organization (management of the land, converting an area to a park) of the municipality?
#277 Does the government provide information about any upcoming e-participation activities?
#278 Does the government indicate any outcome of e-consultation resulted in a new policy decision/regulation/service?
#279 Does the portal provide e-voting service to support decision-making in local government?
#280 Does the MGP provide information on the public meetings of the municipality council?

Annex Table 5. Technology indicators

Technology indicators (18)
#214 Is there a "contact us" feature on MGP (e.g., email, phone, address)?
#201 Is MGP compatible with different web browsers?
#202 Can the link for the MGP be found on the first result page of any search engine typically used in that country?
#204 Is the MGP designed with "responsive web design"?
#205 Is a sitemap (or index) available on the MGP?
#206 Is a search feature available on MGP?
#207 Does the site provide advanced search options?

Technology indicators (18)
#208 Is MGP compliant with the markup validity standards set by the World Wide Web Consortium (W3C)?
#209 Is MGP compliant with the CSS style sheet standards set by the World Wide Web Consortium (W3C)?
#210 Is MGP compliant with Web Content Accessibility Guidelines (WCAG2.0)?
#240 Is a 'Help' feature or 'Frequently Asked Questions (FAQs)' section available on MGP?
#241 Does the MGP offer guidance or tutorials to citizens in understanding and using online services? e.g., Help-Link?
#244 Does the MGP have evidence showing that it has been updated in the past month?
#246 Can a person access his/her own data (that local government has on record)?
#247 Can a person to modify his/her own data (that local government has on record)?
#248 Can a business access its own data (that local government has on record)?
#249 Can a business modify its own data online (that local government has on record)?
#288 Is there information on the MGP about a helpdesk call number for supporting people that face difficulties in executing their services online or through any digital channel?

Annex Table 6. Geo-economic and population data for the 13 regions and 74 municipalities (Hellenic Statistical Authority, <https://www.statistics.gr/en/home>)

Region	Municipality	Area (km2)	Population (2021)	Inhabitants per sq.km	GDP per Region	GDP per capita
Eastern Macedonia and Thrace	Drama	840	55.679	70,2	6.509	10.908
	Alexandroupolis	1.217	71.751	59,9		
	Kavala	350.61	66.376	200,6		
	Thassos	379	13.104	36,2		
	Xanthi	495,1	66.875	131,6		
	Komotini	644,9	65.243	103,8		
Central Macedonia	Veria	791,43	62.655	83,5	22.556	12.092
	Thessaloniki	19,3	319.045	16848,8		
	Kilkis	1.599,60	45.308	32,5		
	Pella	668.58	57.039	94,3		
	Katerini	681,9	82.892	125,9		
	Serres	600,479	74.004	127,9		
	Nea Propontida	380.77	34.829	98,0		
Western Macedonia	Grevena	1.859	21.421	13,9	3.381	12.838
	Kastoria	763,3	33.095	47,0		
	Kozani	343	67.224	196,0		
	Florina	827,62	29.500	40,1		
Epirus	Arta	457,2	41.600	94,4	3.685	11.097
	Igoumenitsa	428,4	25.698	60,3		
	Ioannina	403,043	113.978	282,8		
	Preveza	381	30.841	80,9		
Thessaly	Karditsa	647,4	55.979	86,5	8.672	12.172
	Larissa	335,12	164.095	489,7		
	Volos	387,14	139.670	360,8		
	Skiathos	49,9	5.802	116,3		
	Trikala	607,6	78.605	129,4		
Ionian Islands	Zakynthos	407,58	41.180	101,0	2.619	12.914

Region	Municipality	Area (km2)	Population (2021)	Inhabitants per sq.km	GDP per Region	GDP per capita
	Corfu	235,8	67.112	284,6		
	Argostoli	151,6	23.574	155,5		
	Ithaki	117,8	2.862	24,3		
	Lefkada	335,8	21.900	65,2		
Western Greece	Agrinio	1.246,65	89.691	71,9	7.538	11.616
	Patra	334,9	215.922	644,7		
	Pyrgos	456,6	45.365	99,4		
Central Greece	Thiva	822,92	32.410	39,4	8.498	15.322
	Chalkida	424,8	109.256	257,2		
	Karpenissi	948,6	11.445	12,1		
	Lamia	947	66.657	70,4		
	Delfoi	1.121,70	24.165	21,5		
Attica	Chalandri	10,805	77.102	7135,8	78.993	21.134
	Peristeri	10,05	133.630	13296,6		
	Athens	38,96	643.452	16515,7		
	Kallithea	4,75	97.616	20550,7		
	Piraeus	10,865	168.151	15476,4		
	Salamina	93,5	37.220	398,1		
	Acharnes	107,857	108.168	1002,9		
	Fyli	109,128	48.157	441,3		
Peloponnese	Argos-Mykines	1.002,50	39.994	39,9	7.680	13.456
	Tripoli	1.475,80	44.165	29,9		
	Korinthos	611,3	55.941	91,5		
	Sparti	1.181,80	32.786	27,7		
	Kalamata	440,3	72.906	165,6		
North Aegean	Mytilene	568,8	59.034	103,8	2.331	10.163
	Ikaria	255,3	8.843	34,6		
	Limnos	477,6	16.411	34,4		
	East Samos	289,8	20.021	69,1		
	Chios	842,3	50.361	59,8		
South Aegean	Andros	380	8.826	23,2	5.066	14.572
	Milos	160,1	5.302	33,1		
	Thira	90,6	15.480	170,9		
	Kea	148,9	2.335	15,7		
	Mykonos	105,2	10.704	101,7		
	Naxos	495,9	20.578	41,5		
	Syros-Ermoupolis	101,9	21.124	207,3		
	Tinos	194,5	8.934	45,9		
	Paros	196,3	14.520	74,0		
	Kalymnos	134,5	17.752	132,0		
	Karpathos	324,8	6.567	20,2		
Kos	290,3	37.089	127,8			

Region	Municipality	Area (km2)	Population (2021)	Inhabitants per sq.km	GDP per Region	GDP per capita
	Rhodes	1.400,70	125.113	89,3		
Crete	Heraklion	244,6	179.302	733,0	7.878	12.374
	Agios Nikolaos	511,7	27.785	54,3		
	Rethymno	396,3	57.216	144,4		
	Chania	351,3	111.375	317,0		

Annex Table 7. Use of different social media by the 74 Municipalities

Municipality	Facebook	Youtube	Instagram	Twitter	Pinterest	Linkedin	Flickr	Viber	Vimeo
Drama	1	1	0	1	0	0	0	0	0
Alexandroupoli	1	1	1	0	0	0	0	0	0
Kavala	1	1	1	0	0	0	0	0	0
Thassos	1	0	0	1	1	1	0	0	0
Xanthi	1	1	0	1	0	0	1	0	0
Komotini	0	0	0	0	0	0	0	0	0
Veria	1	0	0	0	0	0	0	0	0
Thessaloniki	1	1	1	0	0	0	0	0	0
Kilkis	1	0	0	0	0	0	0	0	0
Pella	1	1	0	1	0	0	0	0	0
Katerini	1	0	1	0	0	1	0	0	0
Serres	1	1	0	0	0	0	0	0	0
Nea Propontida	1	0	0	0	0	0	0	0	0
Grevena	0	0	0	0	0	0	0	0	0
Kastoria	1	1	0	0	0	0	0	0	0
Kozani	1	1	1	1	0	0	0	0	0
Florina	0	0	0	0	0	0	0	0	0
Arta	1	1	1	0	0	0	0	1	0
Igoumenitsa	1	0	1	0	0	0	0	0	0
Ioannina	1	0	0	1	0	0	0	0	0
Preveza	1	0	0	0	0	0	0	0	0
Karditsa	0	0	0	0	0	0	0	0	0
Larissa	1	1	1	1	0	0	0	0	0
Volos	1	1	1	1	1	0	0	0	0
Skiathos	1	0	0	0	0	0	0	0	0
Trikala	1	1	1	1	0	0	0	0	0
Zakynthos	1	1	0	1	0	0	0	0	0
Corfu	0	0	0	0	0	0	0	0	0
Argostoli	1	0	0	0	0	0	0	0	0
Ithaki	0	0	0	0	0	0	0	0	0
Lefkada	1	0	0	0	0	0	0	0	0
Agrinio	0	0	0	0	0	0	0	0	0
Patra	1	1	0	1	0	0	0	0	0
Pyrgos	1	1	0	1	0	0	0	0	0
Thiva	1	1	0	1	0	0	0	0	0

Municipality	Facebook	Youtube	Instagram	Twitter	Pinterest	Linkedin	Flickr	Viber	Vimeo
Chalkida	1	1	1	1	0	0	0	0	0
Karpenissi	1	1	0	1	0	0	0	0	0
Lamia	1	1	0	1	0	0	0	0	0
Delfoi	1	1	0	1	0	0	0	0	0
Chalandri	1	1	1	1	0	0	1	0	0
Peristeri	1	1	1	1	0	0	0	0	0
Athens	1	0	0	0	0	0	0	0	0
Kallithea	1	1	1	1	0	0	0	1	0
Piraeus	1	1	1	1	0	0	0	0	0
Salamina	1	1	0	1	0	0	0	0	0
Acharnes	1	1	1	0	0	0	0	0	0
Fyli	1	0	0	1	0	0	0	0	0
Argos-Mykines	1	0	0	0	0	0	0	0	0
Tripoli	1	1	1	0	0	0	0	0	0
Korinthos	1	1	0	1	0	0	0	0	0
Sparti	1	0	0	0	0	0	0	0	0
Kalamata	1	1	1	1	0	0	1	0	0
Mytilene	1	1	1	1	0	0	0	0	0
Ikaria	1	1	0	1	0	0	0	0	0
Limnos	1	0	0	0	0	0	0	0	0
East Samos	0	0	0	0	0	0	0	0	0
Chios	1	1	0	1	0	0	0	0	0
Andros	1	0	1	1	1	0	0	0	0
Milos	1	1	1	0	0	0	0	0	0
Thira	1	0	0	1	0	0	0	0	0
Kea	1	1	1	1	1	0	0	0	0
Mykonos	1	1	1	1	0	0	0	0	0
Naxos	0	0	0	0	0	0	0	0	0
Syros-Ermoupolis	1	1	1	0	0	0	0	0	0
Tinos	1	0	1	1	0	0	0	0	0
Paros	1	1	0	1	0	0	0	0	0
Kalymnos	1	0	0	1	0	0	0	0	0
Karpathos	1	1	1	0	0	0	0	0	0
Kos	1	1	1	1	0	0	0	0	0
Rhodes	0	1	0	0	0	0	0	0	0
Heraklion	1	1	0	1	0	0	0	0	0
Agios Nikolaos	1	1	0	1	1	1	0	0	1
Rethymno	1	1	0	0	0	0	0	0	0
Chania	1	1	1	1	0	0	0	0	0
Total	64	45	28	39	5	3	3	2	1
Percentage (%)	86.49	60.81	37.84	52.70	6.76	4.05	4.05	2.70	1.35