

# Mapping the differences in online public information by local administrative units in Romania

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## Abstract

We evaluated the differences existing in the public information presented by local administrative units in Romania by analyzing the websites of 3175 local administrative units based on a standard database which contains 17 indicators (grouped into three categories: identification, content and administrative support). We used descriptive statistics for analyzing results and ArcGis 10 for mapping the geographical patterns of distribution. 2769 local administrative units (87.09%) have a dedicated website, but the information presented on them are scarce, and in a direct connection with its rank in the network of settlements. The unbalance between content indicators and the administrative support indicators reveals a politicization of the websites, detrimental to public information and participation. The lowest values of online public information (<20%) are present in counties with a high proportion of profound rural settlements or a particular ethnical distribution of population.

**Keywords:** *Geographic distribution, online information, public services, local administrative units*

## Rezumat. Reprezentarea cartografică a diferențelor în nivelul de informare publică online al unităților administrativ teritoriale din România

Am analizat diferențele existente în informațiile publice prezentate de unitățile administrativ teritoriale din România prin analiza website-urilor a 175 unități administrative locale folosind o bază de date standard cu 17 indicatori grupați în: indicatorii de identificare, conținut și suport administrativ. Rezultatele au fost analizate folosind elemente de statistică descriptivă și ArcGis 10 pentru reprezentarea cartografică a distribuției geografice. 2769 unități administrativ teritoriale (87,09%) au un website propriu, dar informațiile prezente pe acestea sunt deficitare, și în legătură direct cu rangul localității în rețeaua de așezări. Dezechilibrul existent între frecvența indicatorilor de conținut și a celor administrativi de suport indică o politicizare a website-urilor, în detrimentul informării și participării publicului. Cele mai mici valori ale informațiilor publice disponibile online (<20%) se regăsesc în județele cu un nivel ridicat al ruralității sau în cele care au o distribuție etnică a populației distinctă.

**Cuvinte-cheie:** *distribuție geografică, informații online, servicii publice, unități administrative teritoriale*

## Introduction

Public information on data and elements of interest are on the rise in contemporary society (Kassing, Johnson, Kloeber, & Wentzel, 2010) that has identified increased public awareness as a method of achieving its objectives of sustainability (Kendall, 2008) and transparency (Welch, 2012).

The need of authorities to inform the public derives also from the mandatory character of certain information, as foreseen in the provision of several European Directives (Directive 2003/35/CE, Directive 85/337/CE or Directive 96/61/CE). Romania, as a member country of the European Union should enforce the provision of European directives in the national legislation (such as Law no. 544/2001 regarding the free access to information of public interest).

The main purpose of the websites of authorities is to inform and educate the public by ensuring transparency and promoting projects (Karkin & Janssen, 2014) and reducing time consumption, as 80% of the citizens believe that the public services offered on the Internet allow them to save time (Sa, Rocha, & Cota, 2015). Built in an interactive manner, their websites should also have the capacity of

collecting information and monitor public opinion (Uzunoglu & Misci Kip, 2014), increasing the citizen's trust in the authorities (Hong, 2013).

Development of web resources and increased internet access facilitated the flow of information in both public and private institutions. This technological development had a significant impact in the information about data with public character (Chen, Wang, Liu, Wu, & Wang, 2013), national and local authorities developing institutional websites that evolved in the main methods of communication between citizens and public institutions (Karkin & Janssen, 2014), fostering the emergence of the e-government concept (Huang & Benyoucef, 2014).

E-government comes with many definitions (Verdegem & Verleye, 2009), all of them underlying the relation between information technology (Basu, 2004) and increased access and delivery of information or services to the public (Huang & Benyoucef, 2014) with the purpose of increasing the citizen's confidences in the authorities (Morgeson, VanAmburg, & Mithas, 2010) and the communication between actors (Sousa, Agante, & Gouveia, 2014). Although e-government has both information and transaction components, the

current e-government applications remain mainly as a one-way communication (Hong, 2013).

In developed countries authorities have developed their websites and even associated social networks account to them for better reaching the citizens and increasing the transfer of information (Marlin-Bennett & Thornton, 2012) based on changes in the internet through social, economic and technologic tendencies that promote a large involvement of users and greater opening towards the access to information (Georgescu & Popescu, 2014) or promote multimedia tools such as video, audio, or online presentations (Sandoval-Almazan & Gil-Garcia, 2012), although disparities between developed and developing countries in their e-government are still observed by surveys (United Nations, 2014)

Governments worldwide face a permanent challenge of transformation and reinvention, in order to deliver services in an efficient, efficacious and cost effective way (Zhao, Shen, & Collier, 2015), therefore the need to monitor the success of their politics and programs. The E-Government Development Index (EGDI) is an aggregated indicator of three important dimensions of e-government: provision of online services, telecommunication connectivity and human capacity (United Nations, 2014), with a world average of 0.4721.

Previous studies on authorities' websites have focused on the perspectives of users and websites (Wang, 2014), with an emphasis on the accessibility of websites (Youngblood, 2014) in wide range of approaches (Kuzma, 2010). Other studies have analysed the model of communication existing on the websites (Endres, 2009) or the use of websites in academic research, because they contain valuable information for teaching, research and the provision of consulting services (Chen et al., 2013). Only a few studies analysed the geographical distribution of

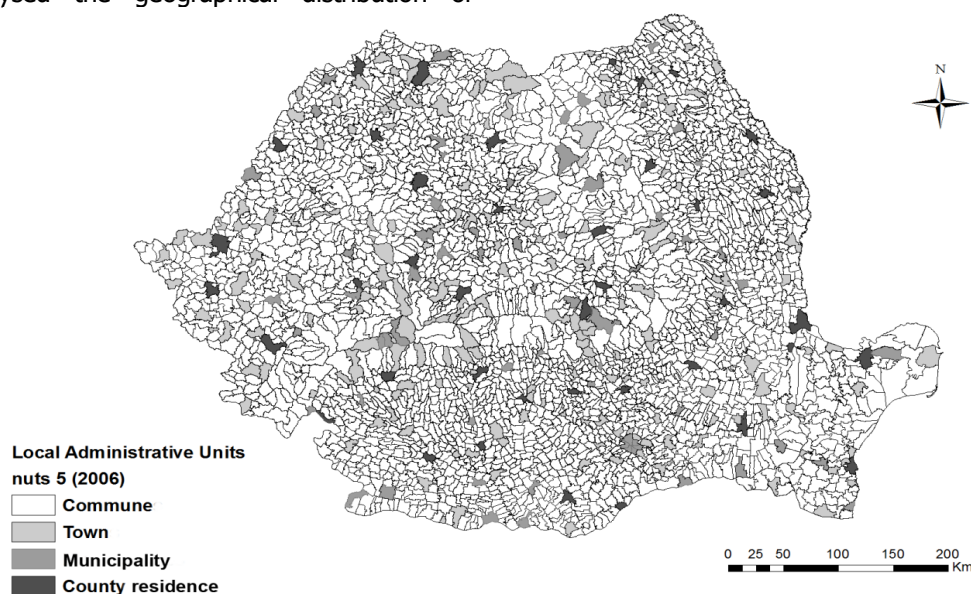
information presented on the websites of authorities (Youngblood, 2014).

Public information is realized in Romania both through traditional methods (panels and notice boards at the headquarters of local authorities – city halls, local councils, environmental protection agencies, etc.) and modern methods (the use of online resources – websites, social media or mass media). The process is confronted with a series of obstacles in the enforcement of an efficient e-government for local authorities in Romania: lack of interest, reduced awareness of the citizens, impossibility of using state-of-the-art technologies, limits in the creativity of employees, deficiencies in using experts in the field (Georgescu & Popescu, 2014). These deficiencies are causes in the emergence of various conflicts (Tudor, Ioja, Pătru-Stupariu, Nită, & Hersperger, 2014) or reduced public support for projects or decisions (Martin, 2007).

The main aim of our study is to evaluate the differences existing in the public information presented by local administrative units in Romania. For achieving this we have established the objectives of (1) assessing the information presented on the websites of local administrative units; (2) mapping the distribution of indicators for identifying geographical patterns of distribution and (3) ranking the local administrative units and counties after the level of public information they present.

## Methodology

In our analysis we evaluated the e-government of local authorities from 3175 local administrative units (Figure 1) - LAU2 (municipalities, cities, communes, corresponding to EU NUTS 5) included in all of Romania's counties (LAU1, corresponding to NUTS 4).



**Fig. 1: Local administrative units (LAU2) in Romania**

We obtained the limits of LAU2 from the National Authority for Cadastre and Real Estate ([www.ancpi.ro](http://www.ancpi.ro), accessed at October 10, 2014) and the list of LAU2 by counties from the public database of the National Institute for Statistics ([www.insse.ro](http://www.insse.ro), accessed at October 10, 2014).

Researchers have used many methodological approaches in exploring environmental issues and the communication surrounding them (Kassing et al., 2010). For our analysis we evaluated the websites of 3175 local administrative units between March and October 2014. As found in other studies that used coding (Dotson, Jacobson, Kaid, & Carlton, 2012) we shared the total sample of LAU2 between 7 college students, native Romanian speakers, and they had a standard database for filling the information (coded so that it will contain mostly numerical values such as 0-absence, 1-presence).

To avoid large differences of approaches between the coders we shared 11.02% of the websites between at least two random decoders and

we found a similarity of 90.50% between them, a percent which we considered reliable for the purpose of our study. The database contained a number of 17 indicators (Table 1) grouped into three main categories:

- Identification indicators: used mainly as metadata and for connecting the recordings in the database with the shapefiles;
- Content indicators: represent the main objective of interest in our study as they represent information we considered to be essential for the website of a LAU2;
- Administrative support indicators: related to the functioning of institution that we used as a control group for assessing if the website was lacking information by design or selectively.

All of the 17 indicators are content indicators – referring to information or services, and not a single one is a design indicator – the way in which the information is presented (Karkin & Janssen, 2014).

**Table 1 Selected indicators used in the analysis**

Indicator	Explanation	Data range
<b>A. Identification indicators</b>		
A1. Siruta code	Unique number used for identifying each local administrative unit	
A2. Type of unit	According to the classification of Romanian settlements	0-commune, 1-town, 2-municipality, 3-county residence
A3. Website	A dedicated website for the local administrative unit	0-not present, 1-hosted on another domain, 2-personal domain
A4. Frequency of updates	Difference between evaluation date and that of the last update	number of days
<b>B. Content indicators</b>		
B1. General data	A short geographic presentation of the local administrative unit	0-absence, 1-presence
B2. Map	Any form of map presenting the local administrative unit	0-absence, 1-presence
B3. General Urban Plan	Presentation of the General Urban Plan (written and drawn sections)	0-absence, 1-presence
B4. Urbanism certificate	Details about the urbanism certificates	0-absence, 1-presence
B5. Construction permits	Details about construction permits	0-absence, 1-presence
B6. Public services	Sections for the public services of the local administrative units	0-absence, 1-presence
B7. Projects	Presentation of on-going and future projects	0-absence, 1-presence
B8. Environmental section	A dedicated section for the environment	0-absence, 1-presence
<b>C. Administrative support indicators</b>		
C1. Contact data	Post address, telephone, e-mail	0-absence, 1-presence
C2. Mayor	Name of the elected mayor	0-absence, 1-presence
C3. Local Council	Structure of the local council	0-absence, 1-presence
C4. Decisions	Decisions of the local council	0-absence, 1-presence
C5. Declaration of revenues	Declaration of revenues for the main staff members	0-absence, 1-presence

All statistical analyses were performed utilizing Microsoft Office Excel and IBM's SPSS Statistics 19 software (IBM Inc.). We used descriptive statistics for analyzing the distribution of each indicator at county and national level, as well as the Chi square test ( $\chi^2$ ) which determines whether there is a

significant association between two indicators (Perkins, Tygert, & Ward, 2014).

In realizing the maps we used ArcGIS 10.X from ESRI, by associating to each polygon in the LAU2 shapefiles the corresponding recording in the Excel database using the A1 indicator – Siruta Code.

Afterwards we were able to realise distribution maps for each category of indicators, but also to aggregate them in a final map. We selected for presentation only maps that revealed a clear geographic distribution or pattern of the analyzed indicator.

## Results and discussion

From the total number of 3175 local administrative units that we analyzed we found that 2769 (87.09%) have a dedicated website and only 406 (12.82%) do not have such an online form of e-government (Figure 2). A number of 115 websites

(3.62%) were either not working or under construction at the time of our analysis. The largest proportion of local administrative units without websites corresponds to communes and other small settlements, situated mainly in remote areas.

A large majority of the websites (2538 local administrative units – 79.81% of the total number) have their own domain (frequently that being “.ro”) while only a small proportion (231 local administrative units – 7.28%) are hosted by a different domain. Websites that are hosted on other domains present little information, mainly about the mayor or contact data.

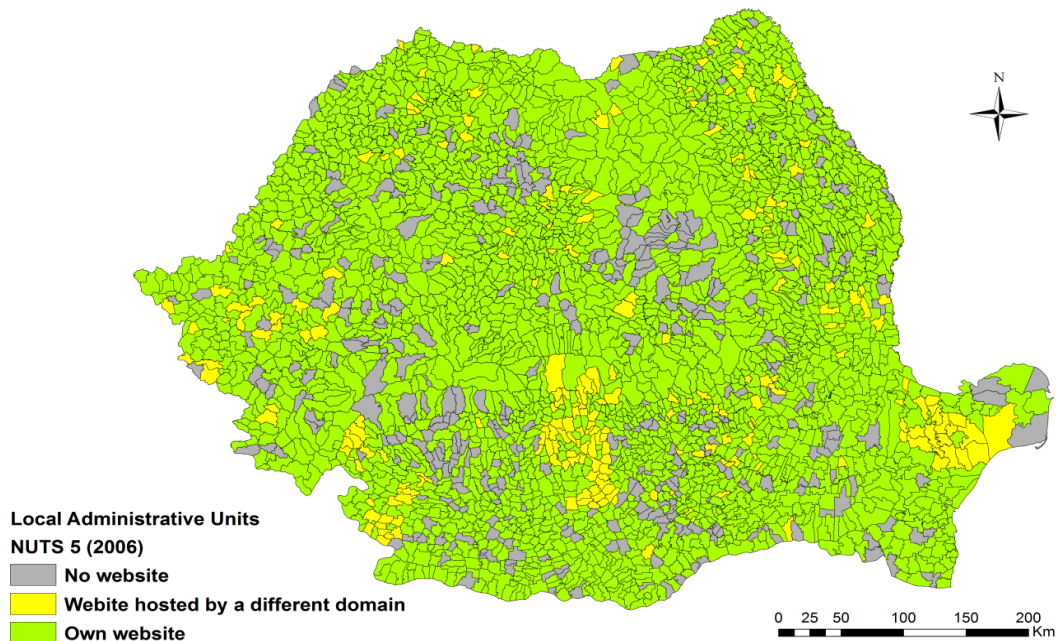


Fig. 2: The existence of a dedicated website for local administrative units in Romania

We observed a connection between the type of settlement and the absence of a corresponding website, as 400 communes (accounting for 13.90% of the total number of communes in Romania) do not have a dedicated website, while only 5 towns (2.63%), 1 municipality (1.47%) and no county residence are in the same situation. The reduced penetration of such services in the rural environment in Romania can be an explanation of the reduced value of the EGDI Telecommunication Infrastructure Component - 0.4385 (United Nations, 2014).

The frequency of updates was a parameter harder to quantify as we were able to count the difference between the date of access and the last post on the website for only 1628 (58.87%) of the local administrative units. We found the difference to be quite impressive, of 281.59 days. We also recorded differences between the frequency of updates for communes (average 292.8 days), towns (235.8 days) and municipalities (69.7 days).

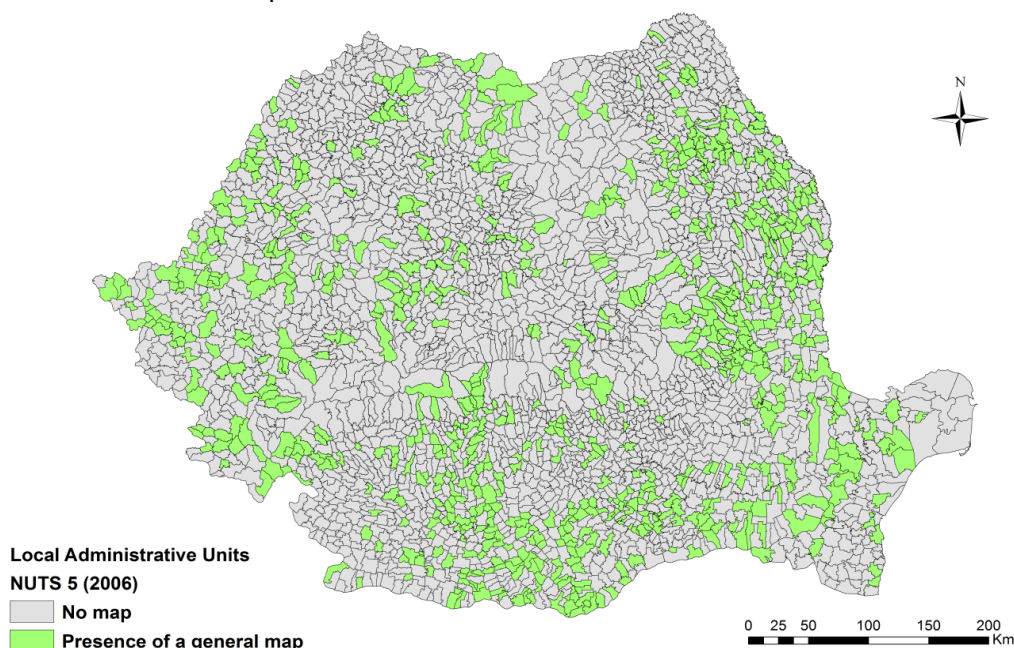
## Content indicators

From the total number of 2769 LAU2 that we found websites for, a number of 2037 (73.56%) presented general data (Indicator B1) about the settlement (mainly the geographical characteristics and data about the population) with no significant difference between urban and rural settlements.

Only 754 websites (27.23%) presented a map (Indicator B2) of the LAU2 (we did not assess the quality of the map or the detail levels presented on the map), with great differences between communes (only 24.22% presenting maps) and municipalities (76.12%). From Figure 3 we can observe that the presence of maps is higher in the regions with higher altitudes, but we cannot make the assumption that this connects with the difficulty of realizing the map, as we observed numerous local administrative units that used maps from external sources. We have found a significant relationship between the variables about general data (B1) and map (B2):  $\chi^2 (1) = 238.218$ ,  $p < 0.001$ .

We have found the General Urban Plan of the local administrative unit (Indicator B3) in only 173 websites (6.25%), with a strong relation between the rank of the settlement and the presence of such

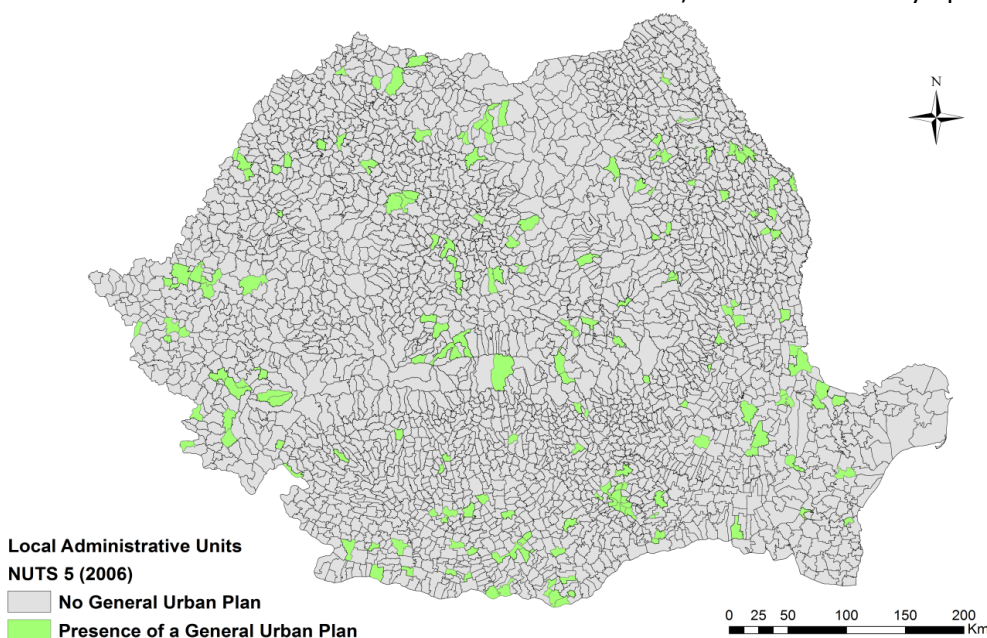
information (4.12% for communes, 18.92% for towns, 28.36% for municipalities and 40.00% for county residences).



**Fig. 3: Presentation of a general map for local administrative units in Romania**

The geographic distribution of the General Urban Plan being present on the website (Figure 4) reveals the small number of local administrative units that make it available on the websites. We were not able

to identify a geographical pattern of distribution, but generally in Romania, local administrative units tend to consider this type of document as being a confidential one, and accessible only upon request.



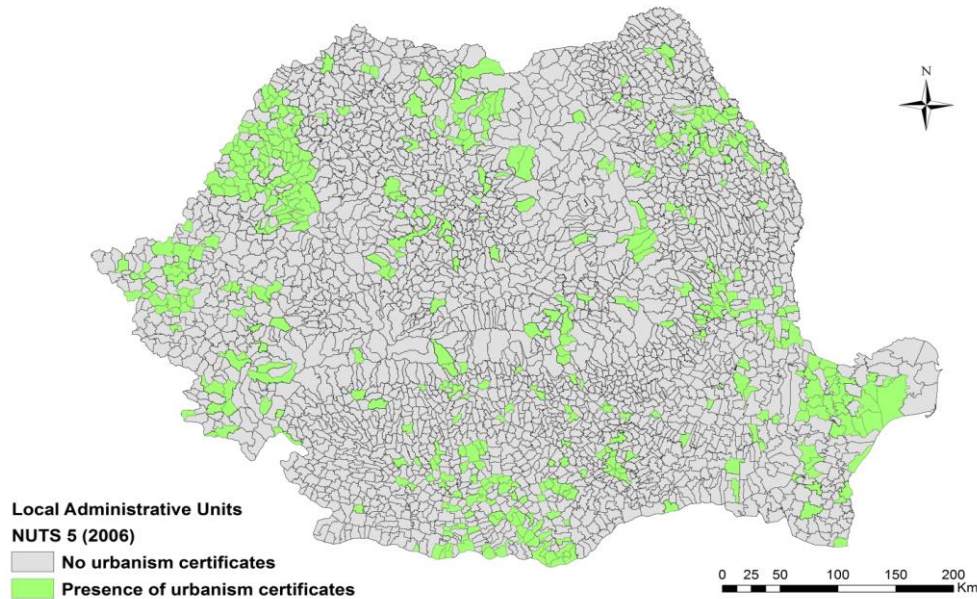
**Fig. 4: Presentation of the General Urban Plan for local administrative units in Romania**

Only 108 LAU2 (3.90%) have both a map and a General Urban Plan (Indicators B2 and B3), ranging between 2.02% in the case of communes to 26.87% for municipalities. The absence of such documents that spatially represent the local administrative units

and its composition is an indicator that authorities are not providing to the general public the opportunities to involve in the decision-making process, and planning according to the perception of the public (Ioja, Rozyłowicz, Pătroescu, Niță, &

Vănău, 2011) still remains a theoretical concept in Romania. The number of websites that presented urbanism certificates (Indicator B4) is slightly higher – 454 (16.40%), reaching 52.24% in the case of

municipalities. From Figure 5 we can observe an increased distribution of these documents in certain areas of the country and counties (Tulcea, Bihor, Timișoara, etc.).

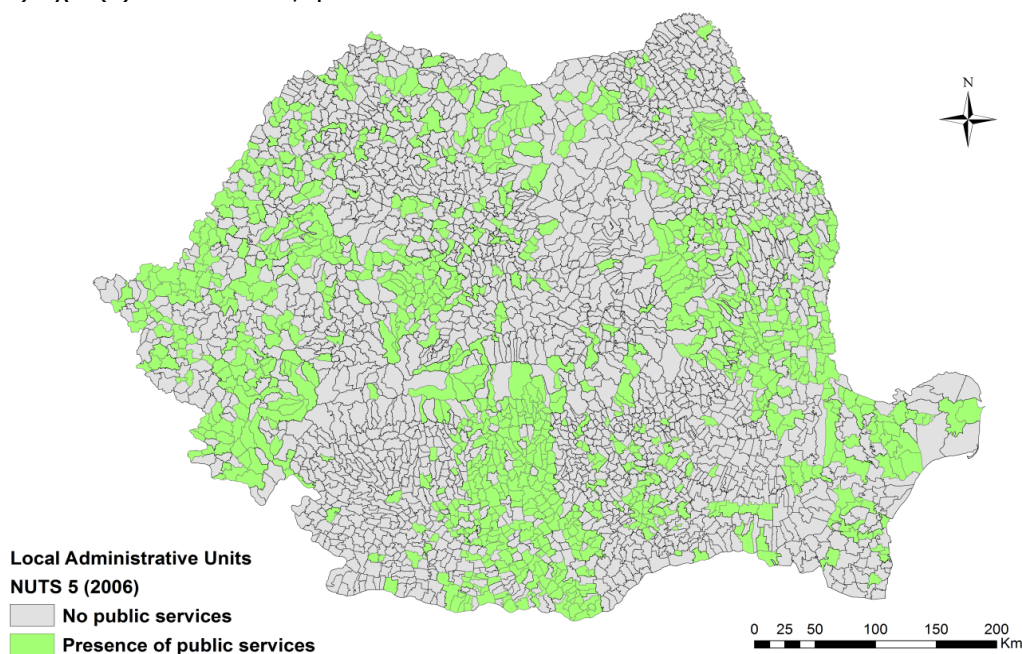


**Fig. 5: Presentation of urbanism certificates for local administrative units in Romania**

A number of 494 LAU2 (17.84%) presented on their websites information about the construction permits (Indicator B5), with variations between 15.50% for communes and 90.00% for county residences. We have found significant relationships between the variables about the general urban plan (B3) and urbanism certificates (B4):  $\chi^2 (1) = 254.355$ ,  $p < 0.001$ ; the general urban plan (B3) and the construction permits (B5):  $\chi^2 (1) = 192.250$ ,  $p < 0.001$ ; urbanism certificates (B4) and construction permits (B5):  $\chi^2 (1) = 1927.705$ ,  $p < 0.001$ . The

small proportion in which these types of information are presented on the websites can have significant land use consequence (Niță, Ioja, Rozyłowicz, Onose, & Tudor, 2014) in the planning process at local and regional level.

From the total websites on 38.17% (1057 LAU2) we can find information about the public services (Indicator B6) offered to the population (Figure 6), the percent increasing in the case of towns (56.76%) or municipalities (70.15%).



**Fig. 6: Presentation of public services for local administrative units in Romania**

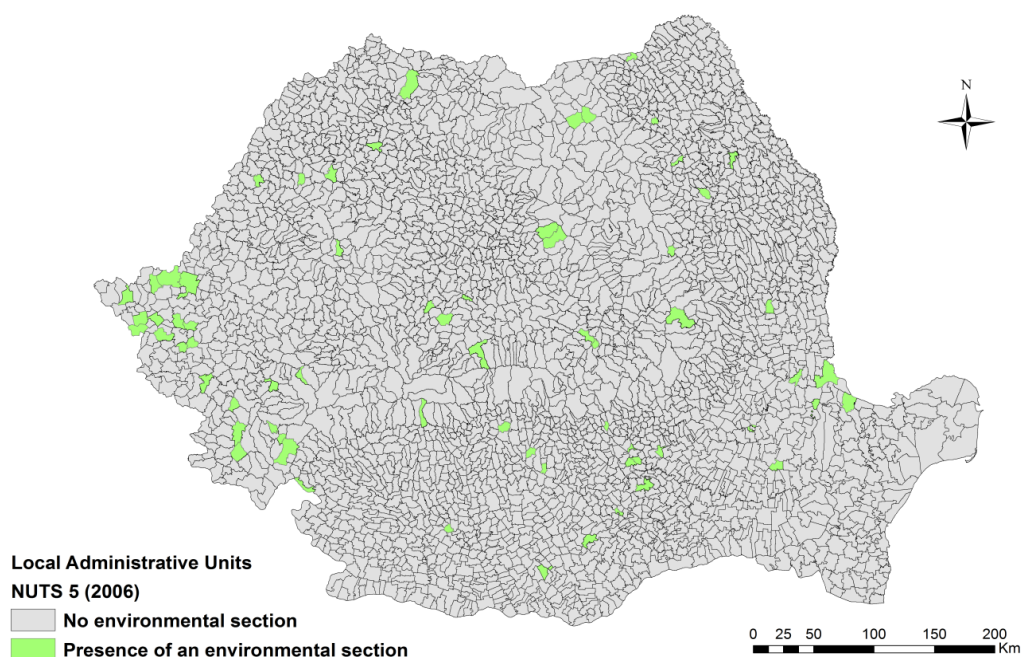
Projects of the local administrative units (Indicator B7) are presented on 1173 websites (42.36%), and reaches up to 79.10% in the case of municipalities, while communes present this kind of information in only 40.21% of the websites. Indicators B6 and B7 are present simultaneously in the case of 26.04% of the LAU2 (23.38% for communes, 39.46% for towns and 64.18% for municipalities).

There is a significant relationship between the variables about the general urban plan (B3) and projects (B7):  $\chi^2(1) = 87.819$ ,  $p < 0.001$  and the general urban plan (B3) and public services (B6):  $\chi^2(1) = 120.666$ ,  $p < 0.001$ . Their presence on the websites indicates that authorities are still behind the potential results and expectations generated regarding the use of websites in disseminating information to the general public (Sandoval-Almazan & Gil-Garcia, 2012).

The presence of an environmental dedicated section (Indicator B8) is the indicator with the lowest appearance in the websites of local administrative units from Romania, only 66 LAU2 (2.38%) presenting such an information (with 1.66% in the case of communes and 10.45% in the case of municipalities).

There is no obvious pattern in the distribution of Indicator B8 (Figure 7) due to the small number of LAU2 presenting them. We have found a small relationship between the variables about projects (B7) and the environmental section (B8):  $\chi^2(1) = 30.038$ ,  $p < 0.001$ , underlying the relation between land use and cover changes and environment (Pătroescu, Vânău, Niță, Ioja, & Ioja, 2011).

The reduced presence of environmental sections is an indicator of the importance given to them by local authorities, which only recently started acknowledging its role in the development of their settlements, and still lack the capability of understanding how to effectively manage the reactions of public (Aladwani, 2013).



**Fig. 7: Presence of a dedicated environmental section for local administrative units in Romania**

The distribution of the content indicators by county (Table 2) indicates large variations between the counties for each indicator: existence of website (in Arges, Ilfov, Maramures, Mures and Neamt all local administrative units have websites, while in Harghita over 50% of them don't), general data about the local administrative unit (22.7% in Covasna to over 90% in Arges and Maramures), presence of a map (smallest values in Buzau county and largest of 67.1% in Vrancea), existence of the general urban plan (24.4% in Ilfov), urbanism certificates (77% in Bihor), construction permits (76% in Bihor), public services (85.3% in Arges), projects (66.3% in Teleorman) and

an environmental dedicated section (11.7% in Caras-Severin).

With the exception of general data about the local administrative unit, for all the other indicators national average are low, under one third of LAU2 presenting such information. Assuming that the results have not been biased during our methodological approach, we can say that similar to other studies, websites of authorities differ in their characteristics and level of detail (Yavuz & Welch, 2014).

Further insight could be directed on analysis explaining the difference between counties for

certain indicators, and finding possible correlation between the values and projects developed by the authorities from respective local administrative units, as they are still a large proportion of the population

who know little about the websites of authorities (Wang, 2014), requiring therefore an optimisation for easier access and increasing online public information (Kopackova, Michalek, & Cejna, 2009).

**Table 2 Distribution of the content indicators by county**

County	No. of analysed LAU2	Without website	General data about LAU2	Map	General Urban Plan	Urbanism certificates	Construction permits	Public Services	Projects	Environmental dedicated menu
			B1	B2	B3	B4	B5	B6	B7	B8
Alba	77	2.6	79.2	29.9	0.0	9.1	10.4	70.1	29.9	2.6
Arad	80	16.3	72.5	28.8	7.5	12.5	12.5	55.0	33.8	3.8
Arges	102	0.0	93.1	9.8	2.0	3.9	5.9	85.3	38.2	2.9
Bacau	93	6.5	77.4	16.1	4.3	9.7	10.8	54.8	41.9	1.1
Bihor	100	6.0	71.0	29.0	6.0	77.0	76.0	53.0	36.0	2.0
Bistrita-Nasaud	62	24.2	62.9	22.6	11.3	25.8	21.0	43.5	45.2	0.0
Botosani	79	2.5	75.9	11.4	1.3	3.8	2.5	5.1	22.8	0.0
Braila	45	17.8	55.6	28.9	11.1	11.1	4.4	24.4	42.2	6.7
Brasov	58	6.9	67.2	12.1	5.2	10.3	8.6	8.6	19.0	3.4
Buzau	88	11.4	53.4	0.0	3.4	1.1	1.1	2.3	12.5	0.0
Calarasi	54	13.0	66.7	38.9	9.3	5.6	5.6	22.2	44.4	0.0
Caras-Severin	77	16.9	80.5	33.8	14.3	23.4	29.9	63.6	57.1	11.7
Cluj	81	18.5	53.1	9.9	4.9	8.6	6.2	12.3	22.2	0.0
Constanta	70	11.4	52.9	17.1	5.7	14.3	14.3	25.7	20.0	0.0
Covasna	44	29.5	22.7	11.4	6.8	4.5	4.5	9.1	9.1	0.0
Dambovita	89	22.5	38.2	15.7	1.1	4.5	4.5	12.4	15.7	0.0
Dolj	113	20.4	29.2	15.0	4.4	4.4	5.3	8.8	12.4	0.0
Galati	64	3.1	87.5	37.5	9.4	28.1	50.0	70.3	67.2	4.7
Giurgiu	53	41.5	43.4	26.4	1.9	3.8	1.9	9.4	26.4	1.9
Gorj	68	44.1	33.8	10.3	2.9	2.9	1.5	0.0	13.2	0.0
Harghita	67	53.7	35.8	7.5	1.5	1.5	1.5	1.5	3.0	1.5
Hunedoara	69	30.4	49.3	10.1	0.0	0.0	0.0	8.7	5.8	0.0
Ialomita	64	14.1	60.9	25.0	0.0	4.7	3.1	10.9	29.7	0.0
Iasi	92	9.8	88.0	48.9	10.9	34.8	52.2	66.3	65.2	1.1
Ilfov	45	0.0	68.9	57.8	24.4	24.4	24.4	55.6	33.3	2.2
Maramures	76	0.0	90.8	22.4	3.9	10.5	6.6	26.3	53.9	1.3
Mehedinti	67	1.5	46.3	20.9	1.5	3.0	3.0	6.0	41.8	1.5
Mures	104	0.0	76.0	10.6	7.7	12.5	12.5	22.1	62.5	1.0
Neamt	81	0.0	84.0	25.9	6.2	8.6	8.6	21.0	46.9	2.5
Olt	113	10.6	87.6	49.6	8.0	32.7	49.6	63.7	61.1	0.9
Prahova	103	13.6	51.5	9.7	2.9	7.8	7.8	22.3	30.1	4.9
Salaj	61	9.8	50.8	4.9	4.9	1.6	1.6	23.0	59.0	3.3
Satu Mare	64	6.3	45.3	1.6	1.6	4.7	4.7	15.6	48.4	0.0
Sibiu	66	9.1	34.8	4.5	10.6	3.0	3.0	22.7	22.7	4.5
Suceava	112	7.1	24.1	5.4	0.0	5.4	6.3	16.1	35.7	3.6
Teleorman	98	10.2	88.8	51.0	16.3	38.8	54.1	68.4	66.3	2.0
Timis	94	4.3	80.9	27.7	4.3	23.4	7.4	38.3	54.3	9.6
Tulcea	51	7.8	70.6	33.3	5.9	51.0	45.1	56.9	21.6	2.0
Valcea	90	23.3	67.8	43.3	2.2	12.2	12.2	37.8	33.3	1.1
Vaslui	87	12.6	81.6	47.1	5.7	2.3	2.3	33.3	35.6	0.0
Vrancea	73	9.6	87.7	67.1	2.7	16.4	16.4	60.3	57.5	1.4
National Average		13.4	63.1	23.9	5.7	13.8	14.6	32.0	36.0	2.1
Minimum		0.0	22.7	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Maximum		53.7	93.1	67.1	24.4	77.0	76.0	85.3	67.2	11.7
Standard Deviation		12.4	20.2	16.6	5.0	15.5	18.3	24.1	18.0	2.6

### Administrative support indicators

Contact data (Indicator C1) are presented on the websites of 2122 LAU2 (76.63%), being one of the most encountered information, that reaches 97.01% in the case of municipalities and 86.49% in the case of towns. Similar to other studies, authorities' website content tends to vary in the provision of employee contact information (Yavuz & Welch, 2014). On 1102 websites (39.80%) are present information about the

mayor (Indicator C2), the percent being slightly higher in the case of towns (50.27%) and municipalities (67.16%).

There is a significant relationship between the variables about the mayor (C2) and the local council (C3):  $\chi^2(1) = 351.033$ ,  $p < 0.001$ , the mayor (C2) and the declaration of revenues (C5):  $\chi^2(1) = 287.611$ ,  $p < 0.001$  or the mayor (C2) and the decisions of the local council (C4):  $\chi^2(1) = 241.617$ ,  $p < 0.001$ . The

composition of the local council (Indicator C3) is presented on 1956 websites (70.64%), with lower values in the case of communes (68.87%) and higher for towns (82.70%) and municipalities (88.06%).

Decisions of the local council (Indicator C4) are shown on 1630 websites (58.87%). There is a significant relationship between the variables about the local council (C3) and the decisions of the local council (C4):  $\chi^2 (1) = 861.691$ ,  $p < 0.001$ . Declarations of revenues (Indicator C5) are presented on 1484 websites (53.59%), with lower values for communes (51.07%), and higher ones for towns (71.89%), municipalities (77.61%).

Although our construction of the database considered these indicators as "support indicators", more like the metadata in the construction of a

geodatabase, we have found that with the exception of information about the mayor, in all other cases the values of these indicators were significantly higher than the ones of content indicators.

These indicate on one hand, the politicization of the websites in the detriment of public information and participation (Cox, 2007). Another explanation could be that this type of information is the only one mandatory to be published by Romanian legislation. Therefore, although transparency of information and participation in government are considered to be linked (Welch, 2012), we see the current approach of local authorities as a "fake transparency", which could reduce their credibility and raise the concerns of population about the use of information and services offered to them (Huang & Benyoucef, 2014).

**Table 3 Distribution of administrative support indicators by county**

County	No. of analysed LAU2	Without website	Contact data	Mayor	Local Council	Decisions of Local Council	Declaration of revenues
			C1	C2	C3	C4	C5
Alba	77	2.6	89.6	44.2	79.2	59.7	50.6
Arad	80	16.3	77.5	21.3	60.0	51.3	35.0
Arges	102	0.0	95.1	16.7	66.7	26.5	45.1
Bacau	93	6.5	81.7	15.1	76.3	53.8	53.8
Bihor	100	6.0	78.0	24.0	62.0	51.0	48.0
Bistrita-Nasaud	62	24.2	62.9	61.3	62.9	48.4	41.9
Botosani	79	2.5	72.2	45.6	68.4	60.8	50.6
Braila	45	17.8	71.1	17.8	66.7	57.8	66.7
Brasov	58	6.9	84.5	19.0	53.4	53.4	32.8
Buzau	88	11.4	73.9	14.8	73.9	62.5	39.8
Calarasi	54	13.0	75.9	13.0	59.3	50.0	38.9
Caras-Severin	77	16.9	76.6	71.4	68.8	51.9	53.2
Cluj	81	18.5	44.4	13.6	59.3	56.8	49.4
Constanta	70	11.4	52.9	28.6	68.6	64.3	64.3
Covasna	44	29.5	29.5	15.9	54.5	50.0	52.3
County	No. of analysed LAU2	Without website	Contact data	Mayor	Local Council	Decisions of Local Council	Declaration of revenues
			C1	C2	C3	C4	C5
Galati	64	3.1	82.8	84.4	65.6	65.6	62.5
Giurgiu	53	41.5	49.1	43.4	28.3	30.2	22.6
Gorj	68	44.1	33.8	26.5	33.8	27.9	33.8
Harghita	67	53.7	35.8	25.4	22.4	17.9	16.4
Hunedoara	69	30.4	50.7	37.7	34.8	34.8	29.0
Ialomita	64	14.1	79.7	34.4	42.2	46.9	37.5
Iasi	92	9.8	82.6	82.6	65.2	59.8	63.0
Ifov	45	0.0	80.0	44.4	80.0	60.0	51.1
Maramures	76	0.0	93.4	40.8	75.0	57.9	48.7
Mehedinti	67	1.5	91.0	32.8	50.7	10.4	19.4
Mures	104	0.0	97.1	38.5	64.4	48.1	38.5
Neamt	81	0.0	96.3	49.4	87.7	72.8	58.0
Olt	113	10.6	83.2	84.1	61.9	55.8	61.1
Prahova	103	13.6	55.3	30.1	54.4	59.2	53.4
Salaj	61	9.8	54.1	23.0	67.2	57.4	54.1
Satu Mare	64	6.3	71.9	28.1	65.6	65.6	42.2
Sibiu	66	9.1	68.2	15.2	71.2	53.0	39.4
Suceava	112	7.1	60.7	19.6	60.7	31.3	39.3
Teleorman	98	10.2	83.7	84.7	67.3	60.2	65.3
Timis	94	4.3	38.3	24.5	68.1	59.6	47.9
Tulcea	51	7.8	80.4	17.6	76.5	76.5	35.3
Valcea	90	23.3	45.6	18.9	56.7	47.8	55.6
Vaslui	87	12.6	24.1	12.6	52.9	55.2	43.7
Vrancea	73	9.6	68.5	28.8	65.8	65.8	63.0
National Average		13.4	66.7	34.0	61.2	51.5	46.1
Minimum		0.0	24.1	12.4	22.4	10.4	16.4
Maximum		53.7	97.1	84.7	87.7	76.5	66.7
Standard Deviation		12.4	21.0	21.4	13.8	14.0	12.4

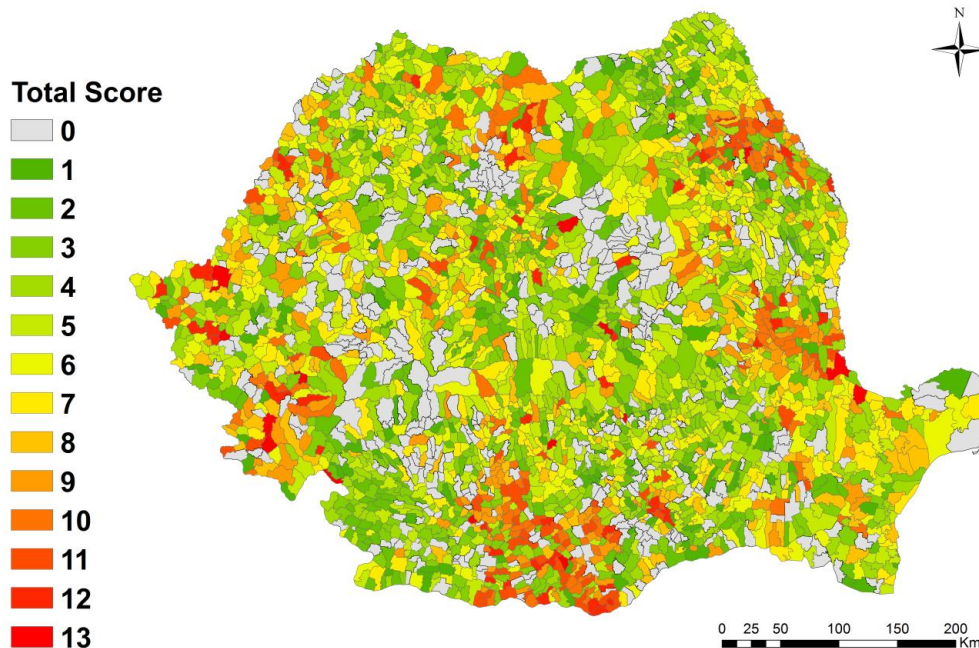
The distribution of the administrative support indicators by county (Table 3) indicates mainly their

higher values confronted with the content indicators, national averages being above 50% for three of the

indicators (C1, C3 and C4). There are differences between the counties for all the indicators: contact data (from 24.1% in Vaslui to 97.1% in Mures), mayor (12.4% Dambovita, 84.7% Teleorman), local council (22.4% Harghita, 84.7% Teleorman), decisions of the local council (10.4% Mehedinti, 76.5% Tulcea) and declarations of revenues (16.4% Harghita, 66.7% Braila).

### Total score of indicators

We considered each indicator as having equal value for the information presented on the website and added them, ranking the local administrative units based on the number of indicators they provide, similar to other studies (Hirwade, 2010). We mapped the results (Figure 8) and found that only 15 local administrative units (0.54%) have on their website all content (B1-B8) and administrative support (C1-C5) indicators.



**Fig. 8: Total score for the e-government of local administrative units in Romania**

Regarding the geographical distribution of online public information by local administrative units in Romania, one can observe areas with a low level in counties such as Harghita (13.20% - total average of content and support indicators by local administrative unit), Gorj (16.97%), Hunedoara (20.07%), Covasna (20.80%) or Dambovita (21.61%). Possible explanations could be the poverty existing in the counties, the high proportion of profound rural settlements or even the ethnical distribution of population. On the other hand, the highest values characterize the counties of Teleorman (57.46%), Iasi (55.43%), Galati (55.05%) and Olt (53.78%).

It is notable that for the purpose of our study we did not use any indicators regarding the accessibility or design of the websites, although we also found that on the websites of local administrative units the emphasis is on copying some visual functionality rather than representing the values underlying them (Karkin & Janssen, 2014; Norton, 2007). Developing countries such as Romania have a reduced degree of organization of the websites, as the main aim of the developers is to upload the information and not to make it accessible to the public, hiding it in

secondary sections of the websites which are harder to access (Marlin-Bennett & Thornton, 2012).

Romania has a value of the E-Government Development Index (EGDI) of only 0.5632, value above the world average (0.4721), making it a country with a high EGDI, but also one of the lowest in the European Union (EU average 0.7300), surpassing only Bulgaria (United Nations, 2014). This is determined by the reduced values of the Online Service Component – 0.4409 (EU Average – 0.5695) and the Telecommunication Infrastructure Component, although the values of the Human Capital Component (0.8100) are rather high.

Romanian authorities are confronted with a process of modernization and restructuring for enforcing the technology of information and communication. As recommended by the Digital Agenda for Europe, local authorities should develop online methods for information or public services, increasing therefore the transparency and efficiency of the institution (Georgescu & Popescu, 2014). This comes particularly challenging as the Romanian urban network appears to be insufficiently developed in terms of number of towns versus the total population and surface (Mitrică, Săgeată, &

Grigorescu, 2014), the large number of rural local administrative units making the efforts of developing an efficient system of online public information difficult.

## Conclusion

Although numerous studies exist assessing the websites of local administrative units, few of them have focused on mapping the geographic distribution or patterns of the analyzed public information indicators. Our study approached especially the information presented on the websites of local administrative units, using this as input data in evaluating local administrative units after the public information they make available to the general public in the online environment.

Results allowed us to identify a series of aspects characterizing the transparency of public information. The main correlation reveals a direct connection between the rank of the local administrative units and the level of public information, both in the quantity of information available as well in the frequency of updates.

We also identified a series of irregularities such as the absence of building permits or the general urban plan, information often given to the public only upon request. Administrative indicators are the most present on websites, with information diverse such as contact data, composition of the local council and its decisions. Only 0.54% of the local administrative units have all the indicators we analyzed.

The small proportion of information present on the websites of local administrative units can be explained by a series of factors such as the lack of interest and knowledge of both the authorities and the population, a reduced level of organization for the website and its deficient visibility, the low level of penetration for technologies of information and communication in the profound rural settlements.

All these obstacles are characteristic to developing countries and represent opportunities for future studies assessing the degree in which public information reaches the population, an indicator of the development of e-government in Romania. Considering the large percent occupied by rural settlements in Romania, this lack of information for low ranked settlements can lead to problems. We acknowledge that Romania has a large opportunity in the number of specialists which can construct the e-government system, but it must also face serious challenges in the development and penetration of infrastructure, especially in rural environments.

One of the main challenges is to develop a state-of-the-art support infrastructure that will allow the enforcement of e-government principles in all regions of Romania, but also increasing the

involvement and understanding of employees in the local administration on the importance of e-government in their relation to the public.

We suggest that future research should concentrate on finding additional factors that will be consistent in developing improved indicators of the distribution of e-government in Romania. Mapping the distribution of such indicators can be of great importance as results should be presented to higher ranked authorities in an easily understandable manner.

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