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***INEQUALITIES IN DIGITAL WELFARE TAKE-UP: LESSONS FROM E-GOVERNMENT IN SPAIN.***

***ENVIADO A: POLICY STUDIES.***

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**Abstract:** In this paper we analyse public policies for the development of digital administration in Europe and focus on Spain as a case study. Thus, we show how digital services offered by the government of Spain are most commonly used by people with higher levels of education, higher economic resources and positive attitudes toward the Internet. The supply of online public services would generate greater benefits for individuals who are better off socially and economically. This is, from our point of view, an example of digital inequalities and participatory digital divide.

We carry out a quantitative analysis (structural equation model) that allows us to study which variables explain why almost half of the Spanish population does not use of the e-administration and how these variables are related. Thus, we obtain an accurate profile of social groups that are the subject of this type of digital exclusion.

Finally, we identify some communities that are cyber-excluded from digital administration and we define these communities as a group with special needs and without specific public policies targeting them.

**Keywords:** E-administration, Digital Inequalities, Participatory digital divide, cyber-exclusion

## ***E-ADMINISTRATION DEVELOPMENT AND INCREASING DIGITAL INEQUALITY. A CENTRAL GOAL FOR PUBLIC POLICY***

### **Introduction**

The development that the Internet has undergone in the last fifteen years is characterized by a very heterogeneous repertoire of practices and strategies, difficult to capture within a single typology. For this reason, one of the most interesting and fruitful discussions on the current state of the issue is the defining of a set of analytical categories that allow the available information on how citizens, companies and public institutions use these technologies to be organised (Benkler, 2006; Gibson and Cantijoch, 2013; Fernández Prado, 2012). The "e-government" category is generally used to include all those measures aimed at modernizing public administration and governmental activities and services that use the Internet as an interconnection platform (United Nations, 2014).

This paper focuses on this category, e-government, and in particular, on one of its most widespread manifestations in developed countries, the implementation of which has been the subject of important and costly public policies. We are referring to e-administration. According to the European Union, e-administration refers to public administrations using ICT in order to improve public services and democratic processes, as well as to reinforce public policies.

However, the implementation of digital public services finds possibilities opened up by the Internet, but also limitations. Thus, the development and increasing employment of e-administration must coexist with the irregular distribution of Internet use in developed countries and, most importantly, with the diversity of attitudes of citizens from these countries towards technology and their degree of digital skills. Concepts such as digital inequality or, more recently, the participatory digital divide, refer to the differences between citizens in being able to participate and benefit from the services and opportunities that, like e-administration, states are offering via the Internet.

The main objective of this article is to identify and describe the social groups that are not in a position to partake in the advantages offered by e-administration, understanding it as

a public service. Once this social group is identified, we analyse the factors that explain why certain individuals and groups are not e-administration users. With this, we offer accurate information about a collective with special requirements, excluded from the advantages offered by e-government and without sufficient specific public intervention programmes and policies aimed at solving the problem. In summary, a target group for social work.

To do this, our article focuses on the case of Spain and is divided into four sections. In this first section, we have defined the framework for our study, as well as our objectives. In the second section, the theoretical framework, we analyse various issues. First, we define the concept of e-administration and frame it within the public European and Spanish programmes for its implementation and development. With this, we point out the public service nature of e-administration and we stress the importance given by public administrations to the participation of all citizens in the digital services and tools that are being generated within the framework of the Information Society. Within this second section we also introduce the concepts of the digital divide, digital inequality and the participatory digital divide. These concepts allow us to identify limitations in the development of the Information Society in Western countries and, therefore, in e-government. In short, we point out the contradictions between the institutional objectives of an inclusive development of e-administration and the persistence of digital inequalities.

The third section is devoted to an empirical analysis of our study. We will firstly describe the evolution of the use of e-administration in Spain, as well as its distribution according to different sociodemographic variables. Secondly, and at a more advanced analytical level, we focus on the population that does not use e-administration in Spain and we will apply the structural equations modelling technique to analyse the factors that allow us to predict why a citizen does not use these services despite expressing a personal need to<sup>1</sup>.

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<sup>1</sup>Specifically, our independent variable will be, as will be explained in the empirical section of this article, people who, despite a need to, choose not to send documentation (forms or other types of documents) to the public service using the Internet. Although throughout this paper we will offer information on other forms of online interaction with the public service, our analysis will focus on the aforementioned behaviour. We have focused on people who do not send documents online to the public service because these types of e-administration services use require greater digital skills as well as an increased digital effort by users.

Thanks to this, we show the characteristics of non-users of e-administration services and we will be able to identify them as a population group in need of specific public policies. These public policies are therefore necessary insofar as e-administration is generating a segment of the population which is e-excluded from public services.

In the fourth and final section of this article, we offer a set of conclusions about the work carried out and propose some ideas on defining public policies specifically aimed at the e-inclusion of people who at present are excluded from e-administration. The main contribution of our work is that, thanks to the empirical analysis and the proposed theoretical framework, we can provide information on the specific characteristics of citizens excluded from e-administration, in order to build public policies aimed primarily at people with such characteristics.

## **Theoretical framework**

### ***E-administration within the framework of the public development of the Information Society.***

As has been pointed out, e-government refers to improving the possibilities of interaction between citizens and government, government and public institutions and between agencies, government and private sector organizations, as well as between government and public employees (Jeong, 2007). It also includes, at least theoretically, initiatives aimed at the development and deepening of democracy (Koh and Prybutok, 2003).

In Europe, the development of e-government is inspired by, among other sources, the *European digital agenda* and the *e-government action plan* 2011-2015 and 2016-2020. In the case of the country this work is focussed on, Spain, from 2005 the various governments have favoured e-government in the context of the various regulatory programmes for the development of the Information Society. The main ones are: *Plan Avanza* (2005-2008) and *Plan Avanza 2* (2009-2011 and 2011-2015). *Plan Avanza 2*, an extension of the *Plan Avanza*, has opted for strategic lines included in the e-government action plan, such as the digitising government services for the public. It has also established the fight against the digital divide and the reduction of digital inequalities as

core themes. In particular, the priority objective has been to reduce the differences between citizens in the use of certain digital services that are a priority for the social, political and economic development of Europe. In this way, both the European and Spanish programmes for the development of the Information Society express their commitment to the balanced and fair development of this new social scenario.

Thanks to policies such as the *e-government action plan* 2011-2015 and 2016-2020, Europe has become one of the areas in the world where e-government development has been most positive. According to data on e-government (EGDI)<sup>2</sup> of the United Nations (2016), European countries occupy a prominent position in the top-ranking 25 countries in the world. In fact, more than half the countries on this list are in Europe. In particular, Spain ranks eighth among all European countries and the first among the countries in southern Europe.

TABLE 1 HERE

E-administration is one of the digital services included under the "e-government" category that is more remarkable in regard to the public effort made towards its development. According to the European Union, e-administration refers to the use of ICT in the civil service in order to improve public services and democratic processes, as well as to reinforce public policies. One of the most important dimensions that e-administration addresses in Spain and Europe is the digitisation of public administration services and the application of ICT to all areas of administration. In this sense, it is important to note that more than 17 million citizens have an electronic identity card (DNI) in Spain, something that facilitates their digital interaction with the civil service.

However, it is important to note that the development of e-government, in general, and e-administration, in particular, is not occurring in the most desirable way. Our objective in the next section is define the concepts of digital divide, digital inequalities and participatory digital divide to point out some observable contradictions between the offering of online public services and the reality of digital inequalities in Spain.

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2 This Index is built on three sub-indices: the index of online services, the index of technological infrastructures and the index of human capital. For more information, see United Nations (2016)

### ***The digital divide, digital inequalities and the participatory digital divide***

The concept of the digital divide originally referred to "the distance between those who have and those do not have access to the Internet" (Van Dijk, 2006, p, 221). During the last decade of the twentieth century and the first few years of this century, specialists began to warn of the fact that there were areas of the world, even within developed countries, where there was a lower infrastructure endowment for access to the Internet, and therefore, citizens enjoyed fewer opportunities to make use of this tool (Hoffmann and Novak, 1998). In this sense, it was noted that the areas with the lowest infrastructure provisions were mostly inhabited by social groups in a socially and economically disadvantaged position (Strover, 1999; Walsh, 2000; Attewell, 2001).

However, and thanks largely to public and private efforts to reduce this type of digital divide, the percentage of people in developed countries who had limited access to the Internet has progressively decreased. The second digital divide then emerged markedly, emphasizing the fact that having access to the Internet did not imply that citizens actually made use of the technology. This new perspective of the digital divide revealed the gap between people who did and did not use the Internet. It also showed that these differences are determined by social variables, whether they are racial (Hoffmann, Novak and Schollosser, 2001), gender-based (Bimber, 2000) or defined by amount of education (Bonfadelli, 2002), as well as by another set of variables related to operational Internet skills (DiMaggio et al., 2004; van Deursen and van Dijk, 2009).

Over the last decade, there have been few empirical studies that have found a reduction in the differences in the Internet penetration rate among the different social groups (Eurobarometer, 2005). Thus, we are seeing an increase in Internet penetration rate in social groups that were initially more reluctant to join in (Author and Author, 2015). In this way, although the differences in Internet penetration rate between men and women, with higher or lower education levels, and between people with greater and lesser

economic resources are not disappearing, they are indeed decreasing drastically (Author and Author, 2015).

In parallel with this process of making inroads into eradicating the second digital divide, a new concept, digital inequality, has emerged, trying to distance itself from this dichotomous way of measuring differences in Internet use (van Dijk, 2006). Thus, and unlike the first and second digital divide, the digital inequality focuses its attention on the population that are Internet users. Drawing from this premise, one of the most interesting efforts has been to analyse the use that citizens place on the Internet and the possibilities and advantages the tool generates (van Dijk, 2005). Some of the issues studied have been around how and the extent to which the Internet allows citizens to express their demands and interests more simply and efficiently (e-administration), how the Internet is a key factor in obtaining better goods and services and how the use of this medium allows access to more competitive resources. From this point of view, Digital Inequality would be the result of the difference between citizens that are able to make use of the digital services that generate advantages and benefits for them and the citizens who do not have the resources to make use of them (Van Deursen and van Dijk, 2009).

Empirical studies have shown how the most advantageous and advanced uses of the Internet have a greater penetration rate among those who are better-positioned socially so that, in addition to their initial social and economic advantages, there would be the advantages due to the Internet (Author and Author, Al 2018). Likewise, experts in digital inequality have discovered that this form of inequality is closely related to the level of digital skills citizens have (Hargittai, 2010; Van Deursen and Van Dijk, 2011), as well as to attitudinal issues such as the subjective utility attributed to the Internet and the subjective ease of use of this tool (Author et al, 2018).

The concept of the participatory digital divide has emerged in recent years within the framework of the study of digital inequalities. This concept is, to a large extent, a result of studies by authors such as Benkler (2006), Hoffmann, Lutz and Meckel, (2015) or Schradie (2011). From their point of view, among the advantages and benefits offered by certain uses of the Internet is the fact that the tool generates greater possibilities for social participation by citizens. This is the case since, as a result of the development of Web 2.0, amateur citizens are in a position to create content and participate more actively in areas



that, like the civil service, tended to be less permeable. The term participatory digital divide refers to the differences between citizens in terms of their ability and opportunities to participate socially, politically or economically online (Blank, 2013; Correa, 2010; Hargittai and Walejko, 2008; Schradie, 2011).

As we have seen, study of the differences produced by the Internet across different segments of the population has undergone several phases over the last twenty years. Thus, experts have turned their attention from the study of the dichotomous differences between those who either have or do not have access to the Internet, or those who do or do not use the Internet, to other more relevant issues, such as the advantages that the Internet produces for certain users. The idea of the participatory digital divide is, in this sense, very revealing, given that it emphasises the existence of differences between the people who have fewer or increased possibilities of participating in digital society.

However, regardless of the type of digital inequality we refer to, empirical studies have shown that there are several persistent factors that define all forms of inequality (Author and Author, 2018). These factors are the individual resources each citizen has (education, economic resources, etc.), the digital skills people have, and their attitudes toward technologies. Thanks to these studies we know that, under the various conceptions of the digital divide, digital inequalities and the participatory divide hide these factors which need to be identified and analysed more in depth. In the case at hand, it is important to conduct an in-depth analysis of how these variables affect the development of e-administration.

## **Empirical Study: Description of the Object of Study, Methodology and Results.**

### ***Description of the objective of study***

According to data from the National Institute of Statistics of Spain (INE), in 2018 nearly six out of ten Spaniards consulted information on the websites of the various public administrations. However, this percentage is significantly lower for more complex activities such as downloading forms and submitting them once completed. In 2018, the penetration rates for these two types of tasks related to e-administration were 44.5% and 44.2% respectively.

In general terms, the observed trend for this service's penetration among the population of Internet users in Spain is positive. The use of e-administration that is technically more complex, the submission of forms, has experienced an increase of more than 20%, increasing from 21.1% in 2008 to 44.2% in 2018. We also note that since 2008, although to a lesser extent, there has also been an increase in the percentage of people who check the websites of the administration and download forms.

GRAPH 1 HERE

However, and perhaps most significant to the objectives of this work, is that a large part of the population of Internet users in Spain does not enjoy the advantages offered by e-administration. In particular, more than half of Internet users did not submit any online form during 2018. Likewise, we see a certain downturn in the percentage of citizens who have joined in the use of this service. In fact, during the last three years we have barely seen any variation greater than two percentage points. This could mean a certain stagnation of the evolution of the service and, therefore, a freezing of percentage of the population that does or does not use it.

However, in regard to the use of e-administration we also find important differences according to variables such as gender, age or level of education. Thus, in 2016 the penetration of this online service is substantially different for men and women. For example, the percentage of men who submit forms to the Spanish public administration online is more than 3% higher than the percentage of women undertaking the activity. Likewise, among people aged 25-44, the cohorts that most use the Internet to interact with the civil service in Spain, the percentage of people who use the Internet to submit completed forms is 41%. On the contrary, for people over 55 and under 25 years old, the percentage is always less than 38%. However, the greatest differences are observed when we describe the use of e-administration services according to level of education. The percentage of people with university studies and those without studies who use the Internet to submit forms is, respectively, 60.2% and 5.3%.

The circumstances described in this section justify, from our point of view, the need for a more in-depth and detailed study of the reasons why such a large percentage of the population does not use the Internet to interact with the public administration. Likewise,

we consider it important to better understand the variables behind this behaviour, in order to be able to define inclusion policies.

### ***Methods and results of the empirical study***

#### *Data sources and sample*

For this study, we have used the data provided by the *Survey on the equipment and use of information and communication technologies in households* for 2018 carried out by National Institute of Statistics in Spain (INE). Therefore, these are data of public nature, which means this is testable research. Likewise, the methodology of data collection and sample design has been verified and endorsed by the INE itself.

The methodology applied is summarized below.

- **Type of survey:** ongoing, of annual periodicity.
- **Population scope:** population living in main family households.
- **Geographic scope:** the entire national territory of Spain.
- **Reference period baseline for results:** first quarter of 2018.
- **Reference period for the information:** most variables researched refer to the period spanning three months prior to the survey.
- **Sample size:** around 2,500 census sections, approximately 20,000 households.
- **Type of sample:** three-stage sample with stratification of the first stage units. The first stage units are the census section, the second stage units are the main family households. For the third stage, an individual aged 16 or over is selected for each household. In addition, information is obtained for all children of ages ranging between 10 and 15.

The ICT-H'16 survey consists of 249 variables and 16,209 records. Given the amount of information contained and assuming that not all this information is required for the purposes of this study, we have selected the variables considered relevant for the purpose of designing the model. The study also focuses on the subsample of people aged between 16 and 74 years old, a total of 13,387 records (82.6% of the sample), who did not use e-

administration to submit completed forms digitally, a total of 6324 records (39%), despite having demonstrated a need to do so, a total of 2240 records (13.8% of the sample).

#### *Data and measurements*

Since the main objective is to measure the relationships between the factors related to Internet use and trust, and the use of public services via the Internet (e-administration), the variables from the TIC-H'18 survey below have been considered. First their mean (M) and standard deviation (SD) in the selected subsample are indicated, and then these are compared to the respective values in the total sample of people aged between 16 and 74, with the values shown in brackets.

**Gender** (SEXO). Variable in questionnaire TIC-H18 and coded as: 0='Male'; 1='Female'. The mean of this variable was M=0.52 and the standard deviation SD=0.49 (M=0.53 and SD=0.49).

**Age** (EDAD). This continuous variable that appears in the questionnaire showed a mean of M=45.74 and SD=12.77 (M=47.86 and SD=14.89).

**Household income** (ING\_HOG). This variable is measured in the questionnaire using a six-value scale. The mean of this variable was M=3.31 and SD=1.73 (M=3.28 and SD=1.83).

**Educational level** (NIVELEST). This variable is measured using a scale of nine categories, in accordance with the Spanish education system, coded with values ranging from 0 to 8, from the *illiteracy* category to the *PhD category*. The mean of this variable was M=3.74 and SD=2.02 (M=3.35 and SD=2.16).

**Concern for personalised advertising on the Internet** (PREOPUB): This ordinal variable which appears on the questionnaire records information about a belief by citizens regarding personalised Internet advertising. The citizens are asked about their concern about this kind of advertising. This variable is measured in the questionnaire using a scale of three categories: 1='Very concerned', 2='Somehow concerned', 3='Not concerned at all'. The mean obtained for this variable was M=2.19 and SD=0.75 (M=2.2 and SD=0.73).

**Degree of trust in the Internet (CONFINT).** Variable that expresses a belief towards the Internet, and that is measured on the questionnaire using a scale of three values: *little or nothing, significant* and *very (much)*. The mean obtained for this variable was  $M=1.71$  and  $SD=0.59$  ( $M=1.75$  and  $SD=0.59$ ).

**Digital skills (HABDIG).** This variable, which expresses the opportunities that a person has to make use of the Internet in an autonomous and advanced way, is built through the hierarchical aggregation of six dichotomous variables present in the questionnaire that measure the ability of the respondent to perform computer-related tasks. This scale includes computer skills that range from *copying or moving files or folders* to *program using a programming language*. The mean of this variable was  $M=2.47$  and  $SD=2.1$  ( $M=2.84$  and  $SD=2.1$ ).

**Degree of disadvantages encountered in the use of e-administration services (NOENVAP):** This variable is measured as an aggregation of six dichotomous variables present in the questionnaire that report on the reasons why the respondent did not submit completed forms to the public administrations online. In order to avoid the high kurtosis in the distribution of this variable, which, to a great extent, would affect the quality of the estimates made by the model, it was decided to code it on a scale of three values: 1='One drawback', 2= 'Two drawbacks', 3='Three or more drawbacks'. The mean of this variable was  $M=1.31$  and  $SD=0.59$  (by definition, the values in the total sample are exactly the same).

Table 2 shows the descriptive summary of the variables that are the subject of this study. The number of records, the range of variation, the mean, the standard deviation and the kurtosis value can be observed. Regarding the latter information, it should be noted that the kurtosis values for the variables of the study, although not very extreme, may endanger the multivariate normality of the data, which leads us to the choice of the *Robust maximum likelihood two-step estimation method* for the calculation of the parameters of the structural equations models.

TABLE 2 HERE

*The Analytical Model*

This model was adjusted following the classical phases of the construction of structural equation models using the iterative specification-adjustment-evaluation-re-specification process, following the standard parsimony-adjustment criteria. It should be noted that it does not seem appropriate, from the empirical experience, to create latent variables for the study of the phenomenon in question, at least as we understand it. As the complexity of the model increases, the adjustment to the data measured by all the criteria decreases significantly, not contributing a great amount of explained information.

In our model, the relationship structure is defined as follows. It is considered that *trust in the Internet* is somehow affected by a *lack of concern for personalised advertising received online*. Thus, *trust in the Internet*, one of the main beliefs included in our model would, therefore, be influenced by a specific attitude towards the medium and that refers to digital advertising. However, under these attitudes towards the Internet lie other attitudes that, according to the analyses carried out, but not included in this section for space reasons, underpin and overlap with these attitudes. These include the fear of being monitored when submitting online forms and concerns over how our personal data will be treated. Therefore, the variable *concern for the advertising we receive through the Internet* hides a whole set of attitudinal variables that would be affecting the citizens' trust in the Internet

Trust in the Internet would also be affected, according to our model, by *digital skills*. That is, by the opportunities that people have to undertake online tasks. These, in turn, depend on the effect of demographic variables such as *gender, age, household income and educational level*. Finally, the combined effect of digital skills and trust in the Internet explain part of the variability of the variable response *non-submission of forms to public administrations, regardless of the need*.

It is a model of structural equations with five exogenous observed variables (*gender, age, household income, educational level and non-concern about Internet advertising*) and three observed endogenous variables (digital skills, trust in the Internet and the variable of interest *I don't submit forms to the public administrations, though there is a need to do so*).

Likewise, covariates that are not significant in the structure are considered null, that is, those between the variable *household income* and the variables *gender* and *concern for personalised advertising on the Internet*, and between the variable *age* and the variables *gender* and *concern for personalised advertising on the internet*. This specification is intended to release degrees of freedom to obtain better estimates of the parameters and a structure of variances and covariates with lower residual values.

#### MODEL 1 HERE

As can be seen in *Table 3*, the coefficients estimated by the Robust Maximum likelihood method are significant, so the presence in the population of the proposed relationships in the stage of model construction is not rejected. That is, we find structures of relationship between variables in the sense predicted.

There is a positive relationship between the variables *degree of concern* and *trust in the Internet* (0.116), *digital skills* and *trust in the Internet* (0.057), *educational level* and *digital skills* (0.448) and *household income* and *digital skills* (0.06). There are also negative correlations between the variables *age* and *digital skills* (0.61), *female gender* and *digital skills* and (0.3), *trust in the Internet* and *non-submission of forms to administrations* (0.39) and *digital skills* and *non-submission of forms to the administrations* (0.019).

It can be concluded that people who did not interact online with public administrations in the last twelve months, having the need to do so, present the following characteristics.

- The lower the concern about *personalised advertising on the Internet* and greater level of *digital skills*, the greater their *degree of trust in the Internet*.
- *Digital skills* are influenced by the increasing *level of education*, decreasing *age* and male *gender*, and to a lesser extent by an increase in *household income*.
- The probability of being a user of e-administration (*submitting forms to public administrations online*) is greater as the level of *Internet trust* and *digital skills* increase. In other words, the lower the trust in the Internet and the digital skills of citizens, the less likely they are to be users of e-administration services.

TABLE 3 HERE

The adjusted model helps us to explain the behaviour observed, as well as the structure of relationships established between beliefs, attitudes and opportunities and the direct or indirect causal relationships this structure has on the variable of interest.

When evaluating the goodness of the fit of the proposed model with the behaviour of the data, the indices commonly used are shown in Table 4.

TABLE 4 HERE

We have considered alternative models to compare the quality of our model. In Alternative Model 1, it has been considered that there is a direct causal relationship between *digital skills* and *concern for personalised advertising on the Internet*. In Alternative Model 2, in addition to the above, it has been considered that there could be a direct causal relationship between *educational level* and the concern for *personalised advertising on the Internet*, as well as between *educational level* and the dependent variable which is the focus of the study has been considered. This last relationship turns out to be insignificant and is finally eliminated from Alternative Model 2.

In the unrestricted model, covariances that were set to zero in the base model are considered free. It is observed, when cancelling these covariances, that the model does not improve in any of the adjustment values, except for a slight yet not significant decrease in SRMR.

It should be noted that this restricted model has a ratio of the value of the chi-square to its degrees of freedom of less than 2, so that the adjustment of the data to the model is considered good rather than simply acceptable (value between 2 and 4). These are the reasons that the structure of the Restricted Model 1 is considered as offering the best fit for the data despite the slight increase in the Akaike index (AIC).



Alternative Model 1 HERE

Alternative Model 2 HERE

Non Restricted Model HERE

## **Discussion**

In this study, we have tried to analyse e-administration as a digital public service subject to the inequalities that affect the Internet. We know that the different European and Spanish public administrations have made significant efforts in developing e-government and e-administration. This effort has led to important progress for these public services that is evident in the studies by institutions such as the United Nations (EGDI), which is also reflected in the Spanish population's penetration rate regarding the use of e-administration.

However, despite this significant effort, the reality in 2016 is that the penetration of e-administration is far from hitting desired levels. On the contrary, e-administration is affected by forms of inequality that, like the second digital divide, are, in other areas, clearly on the decrease. If we analyse the percentage of penetration of e-administration in Spain we find that practically half of the Spanish population never get information through the administration's websites, and that about two-thirds do not download forms or then send them back completed electronically. This situation affects those citizens with fewer resources. That is, people with lower educational levels, less economic resources and it affects more women than men.

However, e-administration, given the potential benefits it offers users, can also be analysed from the point of view of digital inequality and the participatory digital divide. Thus, people with more resources would be in a better position to obtain and benefit from the advantages offered by the service. Likewise, they could participate in the opportunities that e-administration provides to interact with the various public administrations, for example, sending them complaints, claims or petitions.

Our empirical study gives us the opportunity, however, to identify the variables that allow us to understand the reasons why a person, despite needing e-administration, does not use the service. In addition, thanks to the statistical model used, we can also make progress in the understanding how these variables relate to each other and how they are related to our dependent variable (not using e-administration to send forms).

Thus, we know that there are two large groups of variables which explain why a person decides not to use e-administration. These are: digital skills and trust in the Internet. Delving into our analysis we have observed that digital skills are clearly marked by individual citizens' resources, such as educational level and economic resources, as well as by age and gender. The lower the income and the lower the educational level, the lower the level of digital skills; the younger the user, the greater the likelihood that they have a high degree of digital skills.

Meanwhile, trust in the Internet depends on other attitudes and beliefs; mainly, on the concern about being targeted by advertising. However, as we have mentioned, this variable largely includes other variables, such as the fear of being monitored or not knowing how personal data will be handled, which explains why a person trusts the Internet less. Trust in the Internet also depends on digital skills and, therefore, on the individual resources of the agents. The higher the digital skills the more secure the user feels about the Internet.

Our study is not, however, work that seeks, per se, to understand how digital inequalities affect the use of e-administration. Our objective is to identify a set of variables and relationships between variables to be able to report on the characteristics of population groups that require intervention to improve their disadvantageous situation. The idea is, therefore, to feed into the construction of social work strategies.

Public policies inspired by the European digital agenda, as well as in the various *Avanza Plan* programmes by the Spanish government, focus their efforts on reducing the digital divide in the areas we mention next. Firstly, it is a matter of ensuring access to the Internet for all citizens. Secondly, it aims to improve the digital skills and abilities of a set of population groups that, due to their special circumstances, have less developed skills

for Internet use. These groups are, among others, the elderly, the economically less privileged groups and those people living in smaller municipalities.

This being the case, there are already public policies aimed primarily at one of the groups of central variables in our study: digital skills and their relationship with the citizens' individual resources. However, our research has shown, as outlined above, that another of the groups of variables that are the most important for predicting the behaviour analysed are attitudes toward technology. That is, the degree of trust in the Internet and the set of variables that underlie the variable regarding the concern about receiving personalised advertising online (fear of being monitored and not knowing how personal data will be used). Certainly, a part of this set of variables is influenced by digital skills so it could be argued that researching public policies to improve citizens' digital skills implies an investment in increasing the level of citizens' trust in the tool. However, trust in the Internet directly influences the behaviour we are trying to explain so it is, in itself, a variable that requires attention.

Therefore, an inclusive development of e-administration should address strengthening citizens' trust in the Internet. Thus, public policies to reduce digital inequalities in this area should provide information to citizens about rights relating to personal data and why they receive personalized advertising. In addition, Internet users should be better informed about how they are protected from being monitored. In short, we propose to work to generate a digital culture and a digitally trained and informed citizenship. European and Spanish public policies do not currently address this issue and it is, therefore, a priority for social work.

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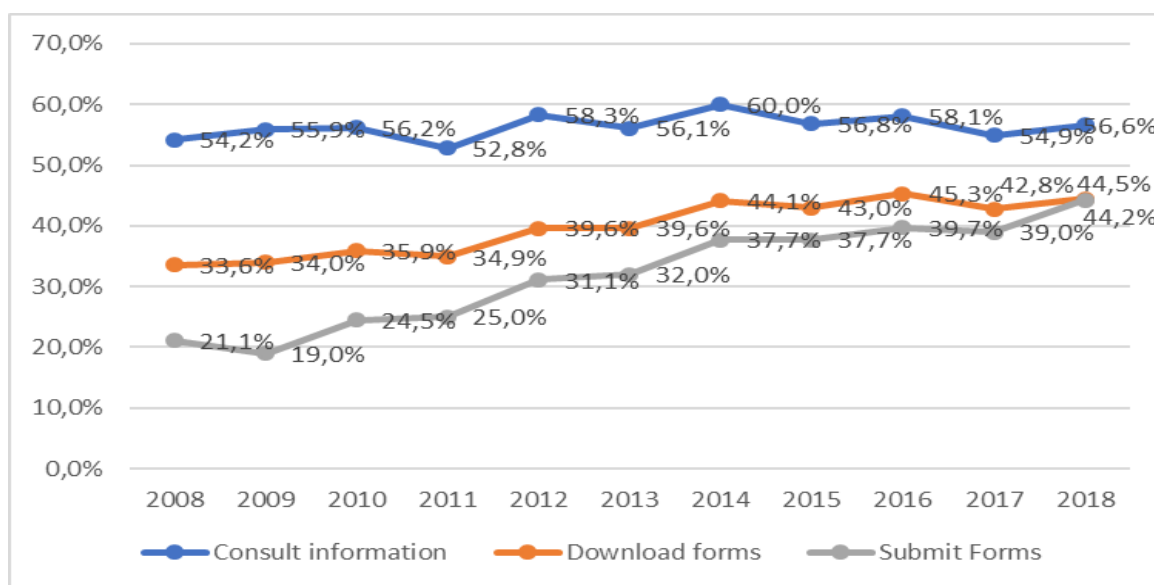
## Tables and Pictures

List of the 25 top-ranking countries in the world on the EGDI index

COUNTRY	POSITION	EGDI 2016
<u><b>United Kingdom of Great Britain and Northern Ireland</b></u>	1	0.9193
<u><b>Australia</b></u>	2	0.9143
<u><b>Republic of Korea</b></u>	3	0.8915
<u><b>Singapore</b></u>	4	0.8828
<u><b>Finland</b></u>	5	0.8817
<u><b>Sweden</b></u>	6	0.8704
<u><b>Netherlands</b></u>	7	0.8659
<u><b>New Zealand</b></u>	8	0.8653
<u><b>Denmark</b></u>	9	0.8510
<u><b>France</b></u>	10	0.8456
<u><b>Japan</b></u>	11	0.8440

<u>United States of America</u>	12	0.8420
<u>Estonia</u>	13	0.8334
<u>Canada</u>	14	0.8285
<u>Germany</u>	15	0.8210
<u>Austria</u>	16	0.8208
<u>Spain</u>	17	0.8135
<u>Norway</u>	18	0.8117
<u>Belgium</u>	19	0.7874
<u>Israel</u>	20	0.7806
<u>Slovenia</u>	21	0.7769
<u>Italy</u>	22	0.7764
<u>Lithuania</u>	23	0.7747
<u>Bahrain</u>	24	0.7734
<u>Luxembourg</u>	25	0.7705

Graph 1: Evolution of diverse uses of E-administration in Spain (2008-2018)



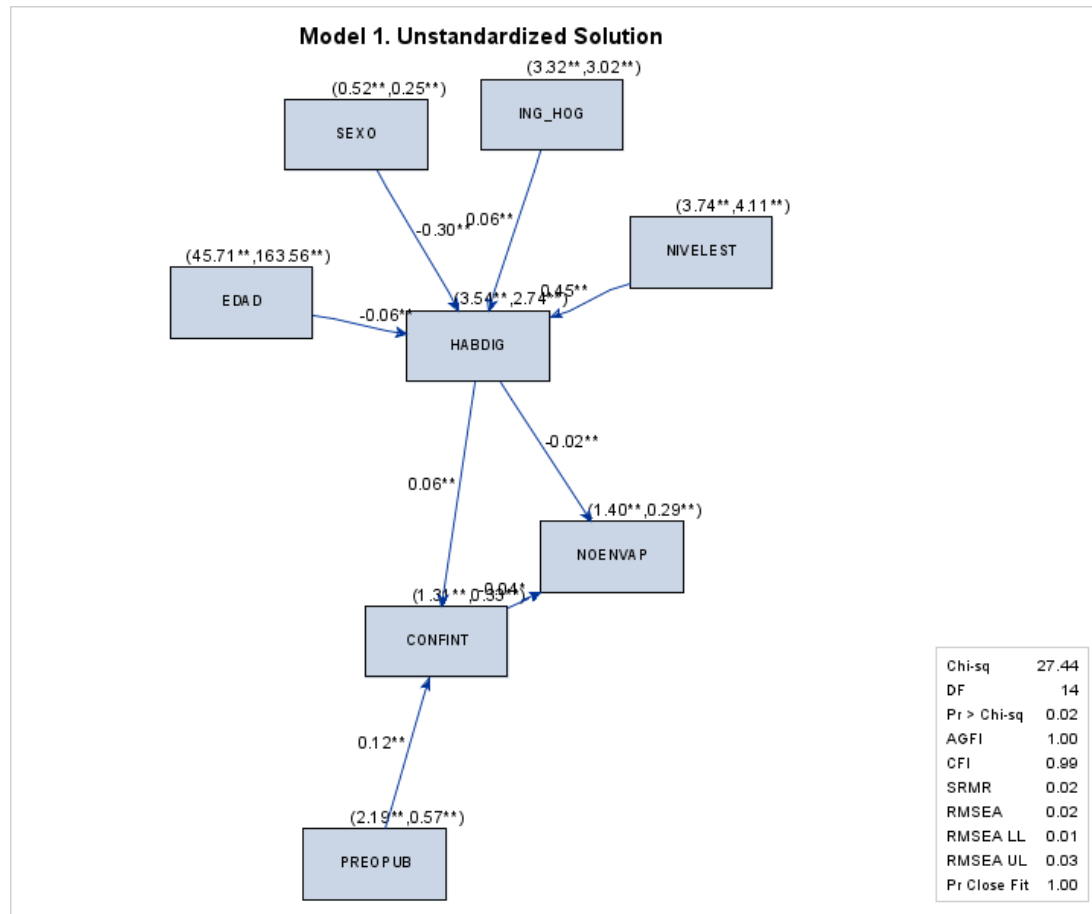
**Table 2:** Descriptive statistics.

Variable	N	Min	Max	M	SD	Kurt.
<b>Sex</b>	2240	0	1	0.520	0.499	-1.995
<b>Age</b>	2240	16	74	45.740	12.773	-0.549
<b>Incomes</b>	2240	1	6	3.312	1.732	-1.199
<b>Education Level</b>	2240	0	9	3.737	2.023	-1.188
<b>Perceived preoccupation</b>	2240	1	3	2.187	0.752	-1.177
<b>Perceived confidence</b>	2240	1	3	1.708	0.594	-0.593
<b>Digital Skills</b>	2240	0	6	2.471	2.072	-1.567

No e-admin 2240 1 3 1.310 0.590 1.991

M: mean; SD: standard deviation; Kurt.: Kurtosis

### Model 1. Unstandardized Solution



**Table 3.** Path analysis. Coefficients estimated by robust ML

			Estimate	SE	t value	Sig.
PREOPUB	==>	CONFINT	.116	.016	7.247	***
HABDIG	==>	CONFINT	.057	.006	9.886	***
NIVELEST	==>	HABDIG	.448	.018	25.172	***
EDAD	==>	HABDIG	-.609	.003	-22.222	***
SEXO	==>	HABDIG	-.302	.070	-4.306	**
ING_HOG	==>	HABDIG	.062	.020	2.994	**
CONFINT	==>	NOENVAP	-.039	.019	-2.013	**
HABDIG	==>	NOENVAP	-.019	.005	-3.355	**

SE: standard error; CR: critical ratio.

\*\*\* < .001; \*\* < .05.

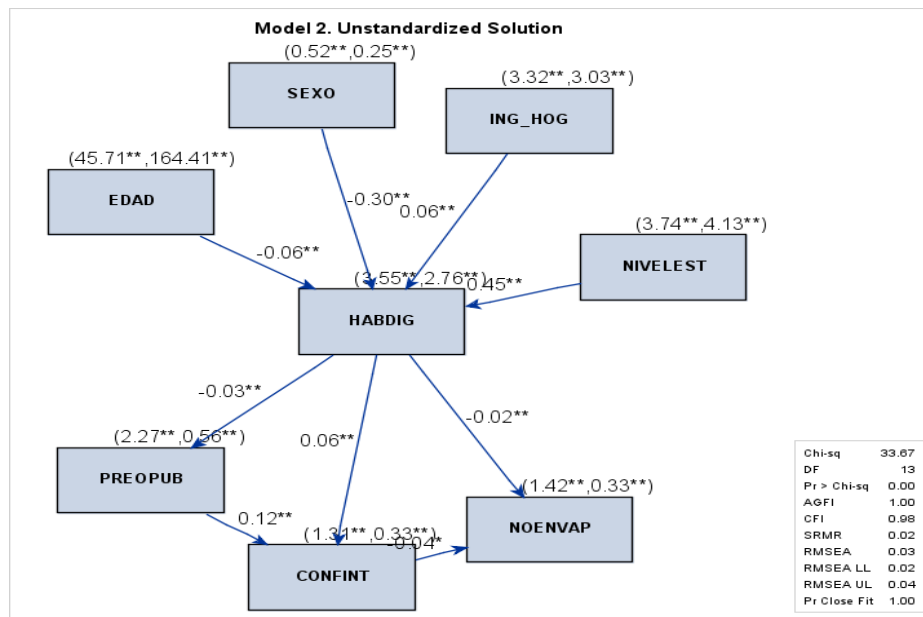


**Table 4.** Fit indices for the path analysis.

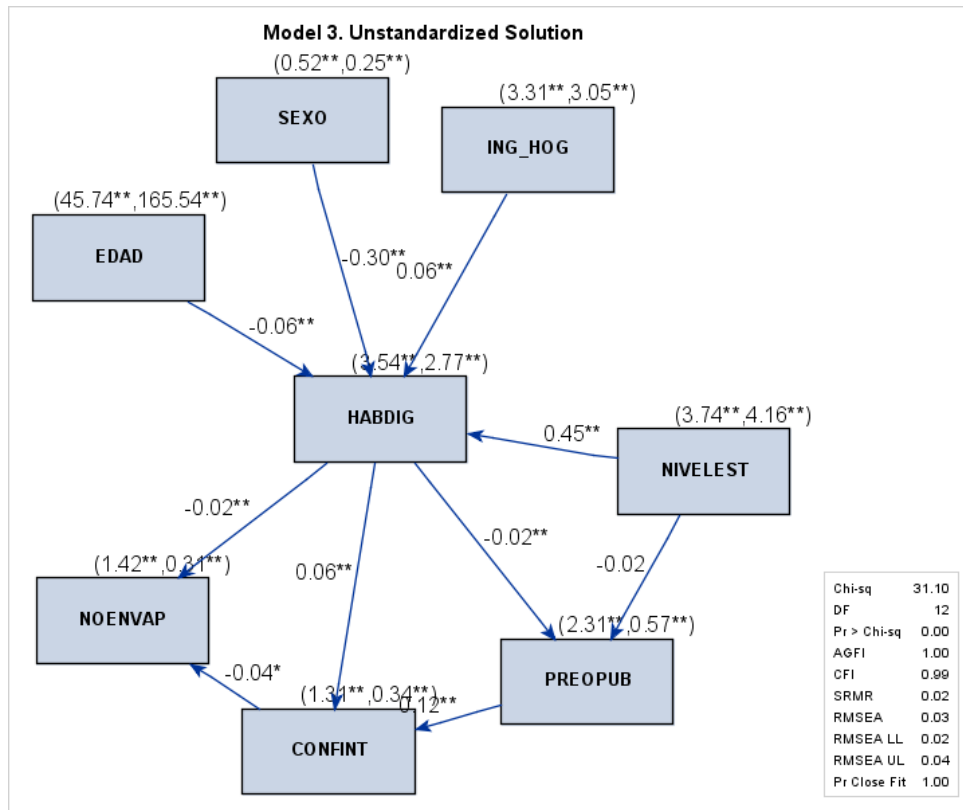
Model	Chi-square	df	Chi/df	N	GFI	AGFI	TLI	CFI	RMSA	SRMR	AIC
Current model	27.440	14	1.96	1933	0.999	0.999	0.979	0.990	0.021	0.016	87.44
Alternative Model I	33.672	13	2.59	1487	0.999	0.998	0.966	0.985	0.026	0.019	95.67
Alternative Model 2	31.102	12	2.49	1514	0.999	0.998	0.968	0.986	0.027	0.017	93.97
Unrestricted Model	23.264	10	2.32	1829	0.998	0.991	0.974	0.991	0.024	0.015	74.43

N: critical N index (Hoelter); AGFI: adjusted goodness of fit index; TLI: Tucker-Lewis index; CFI: comparative fit index; RMSA: root mean square error of approximation; SRMR: standardized root mean square residual; AIC: Akaike information criteria.

### Alternative Model 1



## Alternative Model 2



## Non Restrigned Model

