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**Research Article**

# TECHNOLOGICAL CHANGE DIGITAL AND CIVIC DIVIDES, REALITY THAT FACE MEXICO´SELECTORAL PROCESSES

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**ABSTRACT**

This article presents part of the outcome of the national survey of electronic voting in 2014, which was applied to citizens in their home. Results show the existence of the digital and citizen divides, the last one derived, in part, from the digital gap. In addition it highlights the presence of the perspectives of differentiation and fragmentation in the meaning citizens have with respect to electronic voting, all of which leads to consider the great challenge that involves implementing this type of vote in Mexico and possible strategies for its implementation.



## INTRODUCTION

The third grand revolution that humanity has lived after the agricultural and industrial ones is the technological, with which new paradigms have risen, this current era, called postmodern, is marked by the electronic unification of the planet through the technologies of information and communication (ICT)[4]. This reality represents an opportunity and a challenge, due to the fact that contemporary societies face inequities such as the digital gap, defined as the differences between groups and individuals in terms of access and the ability to use technology effectively, as well as content-related aspects[26].

It is important to stress that through these virtual spaces humans can create knowledge, interact and relate in previously unimaginable ways. In fact through social networks, there are countries that have made radical changes. In the search for an opportunity to be able to make electoral processes with ICT, surveys have been done where citizens are asked to answer in order to establish their views and determine the feasibility of its use.

This article presents the meanings of: technology, technological change, digital and civic gaps, interpretative dimensions, as well as electoral processes, with the purpose of having a common meaning to analyze the outcomes associated with the opinion that citizens have about electronic voting, as well as the use and access to ICTs, derived from the analysis of certain items that are part of the national public opinion survey related toe-voting Followed by methodology and results derived from the analysis of certain items referred to in the instrument and compared with the theoretical and empirical aspects regarding the digital divides in Mexico, which will have to be considered at the beginning of an electoral process through electronic voting, so all citizens which are part of the electoral process can feel included in the elections.

Taking into account what has been mentioned, this research had the following objectives: 1) 1) to establish a theoretical framework related to the object of study to be able to interpret results; 2) To analyze the digital gap and meaning citizen's give to electronic voting in Mexico.

### *Theoretical Framework*

### *Technology*

One of the key concepts is the word technology, conceived as "...all the attempts of man to change and convert elements of their environment into objects of use [1], is the kind of production techniques that incorporate knowledge and scientific methods in their design and development [26] in addition to procedures, both for the manufacture of products, as for information and communication technologies and the development of the administrative processes of enterprises[6]. These definitions involve: a) knowledge which can be formal or tacit related to the processes which apply technology and

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elements present in the environment. ((b) information and its means, because it is through it that humans know situations and components that have been reinterpreted and translated in order to be used in new ways and c) the relationship between the subject and object of knowledge.

***Technological change***

in this time change is a common denominator for all human beings that inhabit Gaia, this situation means, starting from the second half of the 20th century a big challenge, since the discoveries and technologies are moving surprisingly fast, in such a way that it is very difficult to keep up to date with all the modifications and novelties that are manifested as well as of the social phenomena that arise in response, reflecting the complexity that has been generated due to the influence that have changes that can be catalysts for modifications that make a system alter their patterns of behavior and different paradigms are generated.

Without doubt one can say that the use of the technology has generated new ways in which various practices in the tasks of humanity are done, which means that a turn in the course of history was made in the forms of production, of life and of the acquisition of knowledge for mankind, It isprecisely considered that this technological revolution has led to a new society marked by globalization, technological and information innovations, influencing the economy and labor market, as well as in politics, competitiveness, creation of new training strategies, new forms of fun and interaction between individuals [12], such as social networks, and different forms of communication via twitter, Facebook, and Whats App, among others.

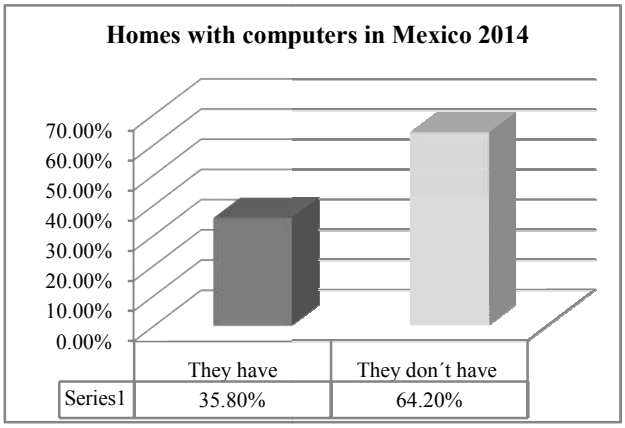
This implies that changes in paradigms and technologies do not occur in a void, by themselves, and are not determinants of history and social evolution that are given in the society, derived from the link which unites them, since in order for technologies to arise it is necessary a specific social context and, at the same time, with their presence, the derived need to set up new models for social, cultural and economic scenarios [8],this means that internal and external criteria's to evaluate technologies are used: first efficiency, and second the value that society gives to the technology that it is to be used or developed [23], and with the latter society gives technology a social meaning.

It should be noted that artifacts, in this case, technology, found on the surface of the culture are the tangible aspects that make it visible, which when modified influence the values and assumptions that are at its core. So when modifying the forms of production and technological objects there is an impact on the values and beliefs of society [25]. In this sense the concept of technology as a stone, as the extrinsic object hitting, modifying the economic, political, social and cultural dimensions of society can be incorporated [24], as well as to the values and beliefs of the people in the environment of the planet and, in doing so, all spheres of human existence are modified.

This aspect does not inhibit the vision of the potential that ICTs used in a proactive way can do, as it is considered that the technologies are neither good nor bad, it depends on the use we make of them [18], therefore technological change opens a spectrum of opportunities for mankind and its development, here the question is whether this will be harmonious and inclusive, or will widen the fissures between developed countries and those who are in the process of being and, within them, between different social groups that comprise them.

***Technological Divide***

At present when every technological advancement can be read in the first instance as social progress, it is important to note that this does not reach all levels, due to the fact that there are social sectors to which these advances do not benefit, and the difference between those who are integrated into this new technology and those who are not, mark unevenness in the access, use and benefits of these new technologies [27]. This leads to consider the presence of **digital divides** in post-modern societies, and it is said that it is probably one of the first concepts that initiates the reflection around the theme of the social impact of ICTs. And the differences that these technologies will produce around the development opportunities of the populations from the distance between those that have and those that don´t have access to ICTs[27]. In fact, the first digital divide is defined according to the access to computers and Internet[26].




**Graphic1** Access to Technology in Mexico

Source: INEGI [16]

In Mexico, according to the data presented by INEGI (National Institute of Statistics and Geography) (Graph 1), in 2013 only 35.80% of citizens had a computer in their house, while in developed countries, 75% of the homes has this type of equipment. Also, in Mexico almost 70% manifested the absence of a connection to Internet; this shows the presence of the first digital divide, the one related to access in the country País [16].

These results will have to add the differences that exist between accesses to computers by State in Mexico. In fact in Chiapas 16.8% of households have a computer, in Coahuila 11.8%, Oaxaca 12.6%, Guerrero 15.3%, 17.4% Tlaxcala, Hidalgo 18.2% and Michoacan 19.3%. Likewise, the states whose access in more than 50% are: Baja California Sur 50.7%, Distrito Federal 50.2%, 47%, Nuevo León 46.8% Sonora, Baja California Norte 46.6%, and Quintana Roo 42.6% these data reflect the States where there is a greater digital divide and

those in which it is even smaller, and where it manifests its presence to a lesser extent (INEGI, 2014b).

The ***second digital divide*** refers to applications (both intensity and variety), and is determined by the capabilities and skills of the users to use computers and Internet [26]. In this second gap, the barrier to overcome it is not referred to access to (have infrastructure, equipment, use of computer programs), but to skills and competencies in the use of the technologies of information and communication. These are conceived as the abilities, skills, knowledge and attitudes applied to the use of the information and communication systems, including the equipment that it implies [5] and that is reflected in the rate of preparation to connect on the network (The Networked Readiness Index 2014), where Mexico ranks in the 79th place of the world's countries because significant investments have failed to achieve changes in the area of application of the technologies [28].

In fact the digital literacy refers to the management of audiovisual and digital tools that allow a rapprochement between the different generations andreference points can be set in order to share the different ways of interpreting the world [2], this means that people have skills and abilities to use computers and Internet and resources that enable them to interpret and analyze the information in virtual spaces , so that those who do not have this training, are in a digital illiteracy condition.

***Digital and civil divide***

When there is the existence of the digital divides one and two, where the second refers to digital illiteracy, the presence of the civic gap is assumed, this one is conceived as the one that prevents citizens to participate through the critical use of information and media that allow them to question and participate in networks citizens.

For Nicolas Martinez[21], talking of citizen empowerment leads to regard ICTs as facilitators of citizen participation that can be deployed in public life to the extent that citizens can and know to take advantage of the emancipatory potential that bring with them the ICT, which requires reducing digital divides one and two, because the first phase would have to be endeavor to facilitate the access of citizens to devices and technological equipment to be able to join in Internet network in the best available technical conditions. Phase two would seek to promote the effective use of ICT through training of potential users in the competencies which require the use of those [21] artifacts. Citizen's participation are determined by these skills, and those who don´t are competent in their use don´t have the facilitators to empowerment.

***Interpretative dimensions***

When people are part of a community they share some cultural aspects and don't have the same interpretation for other features of the same culture, therefore social reality is read different by some members and there is a classification done by Martin in regard to these forms of interpretations: Integration Differentiation and fragmentation. The first one considers culture as a solid stone seen the same way by most of the people regardless the observation angle. Differentiation perspective focuses on the fact that cultural manifestations have inconsistent interpretations, so there is no consensus. For fragmentation the interpretation of cultural manifestations are ambiguous[19].

***Electoral Processes***

The electoral process is a multidimensional model of spatial competition in which competition consists of candidates affecting turnout and the electorate´s perception of each candidate´s positions, and in which the social choice is a police package which the victorious candidate advocates[10]. And through elections representative democracy is possible and the transference of the representation of citizens of a State is possible[11].

Free and fair elections as institutional means of establishing a representative democracy, is set to feature democratic societies. This leads to consider, from the point of view of Goodwin-Gill [13],"...that the adjective "free" refers to the participation and the ability to choose and «fair», refers to equality of participation and voting, impartiality and non-discrimination;" both characteristics together reflect that human rights were respected as a whole and that there was no coercion."

In addition, is considered the fundamental principle that the will of the people is the only basis of the authority of a Government, and that this will must be expressed and accepted through regular, genuine, free and fair elections by universal, equal and secret suffrage to all adult citizens that have the right[13]. So the importance of going to the polls to cast the vote is definitive to be part of the process that leads to power a person who will have in their hands the destiny of the country and, indeed, citizen participation is not optimal, since comparing the nominal list in Mexico with the percentage of people who have gone to the polls in 2012, there is an important gap[15]; [17].

However, in the case of Mexico, as in many other countries of the "third wave" of democratization, things seem to be operating in relatively acceptable manner in terms of the forms that define access to power, while several of the minimum attributes are absent from the limited and responsible exercise. Is then a partial and distorted democratic regime that even though it seems to have clear and accepted rules concerning access to the power, this doesn´t happen in relation to the forms of its exercise[14].

***Votoelectrónico y sociedad***

In this context arises as an option the use of electronic voting in Mexico, this is defined as "the use of technology" during the process of voting in an election [9]; However, it should be specified clearly to society which will be technology and how will it be used, so that they are better informed at the time of choose whether use of ICTs for casting their vote or opt for the traditional way, because there are digital divides both in access and use of technologies due to the fact that a large number of Mexicans have no competencies that will allow them to vote safely, especially if it is the first time that they face an appliance of this type, which has no meaning for many of them and can generate rejection.

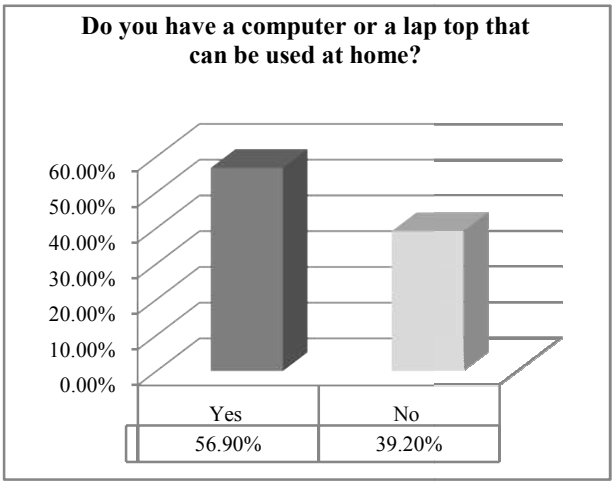
Of course this will not happen with digital natives or those who have been alphabetized and used these means, so that is required to generate strategies that even though they allow the progress of the country towards the innovation and

development, this has to be done without excluding vulnerable groups.

## MATERIAL AND METHODS

Results of this research took as reference data the ones provided by the survey national electronic voting 2014, which was held from November 21 to December 2 of the cited year.
The methods used were analytical-synthetic and theoretical-deductive. It can also be said that the research was applied and descriptive, of a field and bibliographic mode; using quantitative methods due to the fact that the data were gathered with quantitative (questionnaires) and through bibliographic techniques. The questionnaire was applied to citizens in their home. [9]. Results are shown in a quantitative way and to make their interpretations SPSS version 15.0, was used and also, Excel for the construction of graphics.

## RESULTS




**Graphic2** Access to Technology divide

Source: Centre for social studies and Public Opinion. (2014).

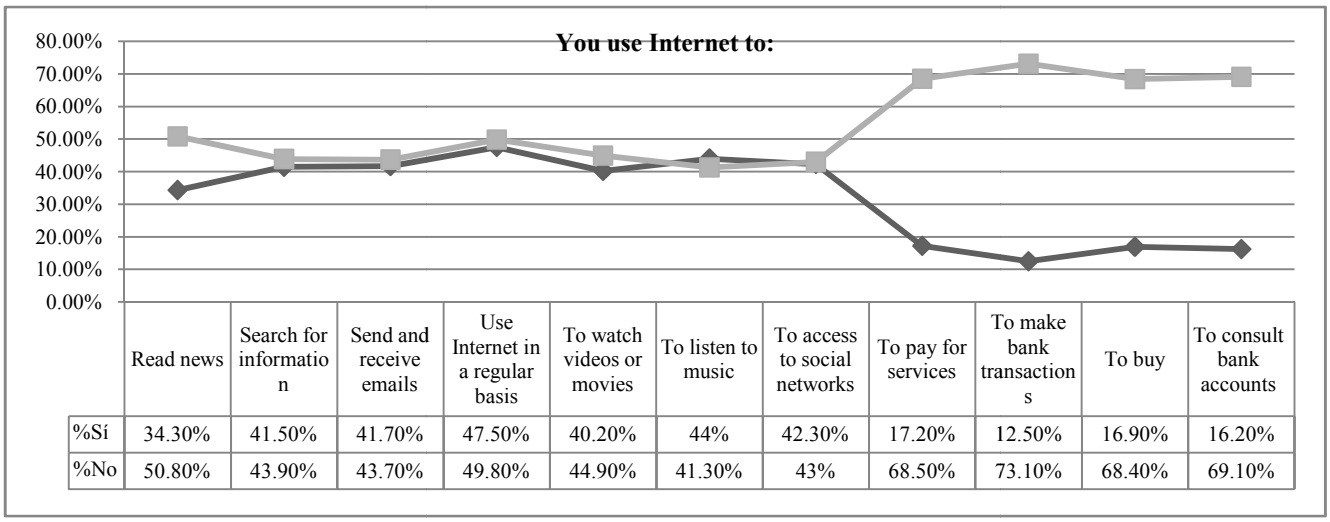
In the data obtained from the information gathered by the CESOP, it can be seen (graphic 2), the presence of the first digital divide for 43% of the population studied.

These percentages differ to those presented by INEGI for 2013, since they reported that 64.20% of Mexicans lacked of computer in their home. Nevertheless, both results agree on the presence of the gap for a significant number of citizens, in any way, some of them can access the ICT at school or at work, because the same INEGI, states in their results that in Mexico 46.7% of the population uses the computer and 43.5% is an Internet user (INEGI, 2014b). This reflects that more than 50% of the inhabitants live in the digital divide.

As it can be seen in graph 3, 47% of the population studied uses Internet, result that differs by 4 percentage points to the numbers presented by INEGI 43% [16], this information is consistent with the percentage of people residing in Mexico on the digital divide. In addition, this is emphasized with regard to the use of ICT in aspects related to the payment of services, making purchases and consultation of bank balances, and it is important to stress that less than 20% of the studied population makes use of the Internet for this type of operation.

In terms of ICT uses, where one can find that more than 40% of the population uses this technologies to search information, send and receive emails, watch movies, listen to music, access to social networks and, in general, the use of the Internet. Some forms of the use of ICT, are more related to communication and entertainment (Graphic 3). These results indicate the presence of the second digital divide, which refers to applications (both intensity and variety), and is determined by the capabilities and skills of the users to use computers and Internet [26], and the responses can be seen that more than 40% of the population, in some cases and more than 50% in other reflect under use in the intensity and variety, aspect that can be linked to the population ICT skills.

The lack of participation of citizens in matters relating to elections and politics, may be due to the perception that they have on the situation of the severe crisis affecting the country (Graphic 4). This can be derived from the lack of confidence (Graphic 5) in the promises of the candidates INE, in the leadership of the parties, in politics and in the honesty of politicians, this entails loss of social capital, understood as "the

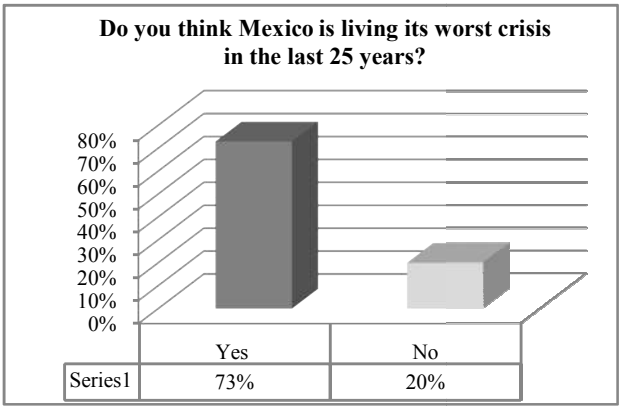



| | Read news | Search for information | Send and receive emails | Use Internet in a regular basis | To watch videos or movies | To listen to music | To access to social networks | To pay for services | To make bank transactions | To buy | To consult bank accounts |
|---|---|---|---|---|---|---|---|---|---|---|---|
| %Sí | 34.30% | 41.50% | 41.70% | 47.50% | 40.20% | 44% | 42.30% | 17.20% | 12.50% | 16.90% | 16.20% |
| %No | 50.80% | 43.90% | 43.70% | 49.80% | 44.90% | 41.30% | 43% | 68.50% | 73.10% | 68.40% | 69.10% |

**Graphic 3** Divide related to competencies in the use of ICT

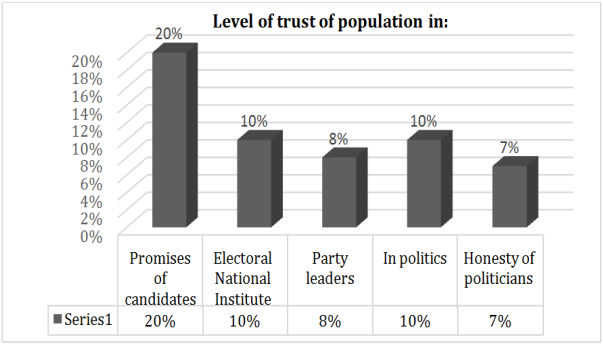
Source: Centre for social studies and Public Opinion. (2014).

aggregate of real and potential resources which are linked to possession of a permanent network of more or less institutionalized relationships of mutual acceptance and recognition [7]." Such capital, according to Bordieu[7], is composed by the confidence and social relations that allow individuals access to resources and the quality of these.




**Graphic4** Perception of citizens about the crisis in Mexico

Source: Centre for social studies and Public Opinion. (2014).

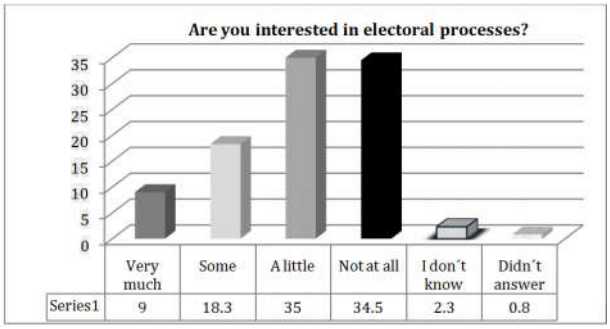



**Graphic 5** Level of public trust in aspects related to politics and his actors

Source: Centre for social studies and Public Opinion. (2014).

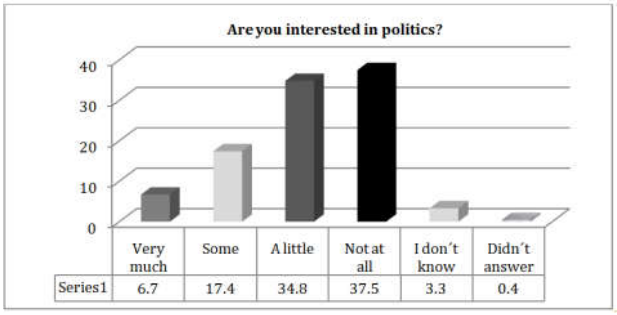
Likewise, it can be considered that the negative feelings that 73% (graphic 4) of the population have on the current situation of the country, insecurity, economic problems and corruption, inhibit citizen participation, which is one of the aspects of democracy, which may suffer a crisis if there is disenchantment of the population, when there is no ability to efficiently solve the problems of the people [22], and in this case it is possible to relate the results of the 5th graphic, which expresses the distrust of campaign promises, in the INE (Electoral National Institute), in politics, the honesty of politicians, as well as the leaders of the parties, all of which leads to consider the need of a joint effort between Government and society in which the common good will prevail, so that Mexico will have the possibility of recovering the credibility of the population both in the political class and institutions, in addition to generating trust and participation.

What Pindado[22] mentions regarding the consequences that a country has as result of the disappointment of the citizens can direct the lack of interest evident in elections by the population, since nearly 70% has little or no interest in electoral processes, as shown in graphic 6, which goes against the fundamental principle that the will of the people is the only foundation of a government authority , and that this will must be expressed and accepted through regular, genuine, free and fair elections by universal, equal and secret suffrage to all adult citizens that have the right[13].




**Graphic6** Interest to participate in electoral processes

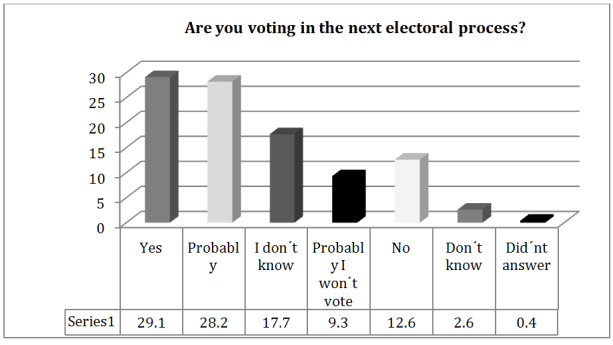
Source: Centre for social studies and Public Opinion. (2014).




**Graphic7** Citizen's interest in politics

Source: Centre for social studies and Public Opinion. (2014).

Interest in the political and electoral processes goes hand in hand with the climate of trust that country lives and the loss of the latter, by citizens with regard to the candidates, to the INE, campaign promises, the honesty of politicians and politics itself, perhaps it also reflects the lack of interest of the electors in politics (graphic 7), which when compared with the results of the graph 6 (where 70% are not interested in electoral processes), you can see a similarity as the apathy prevails.




**Graphic8** Probability that persons vote incoming elections

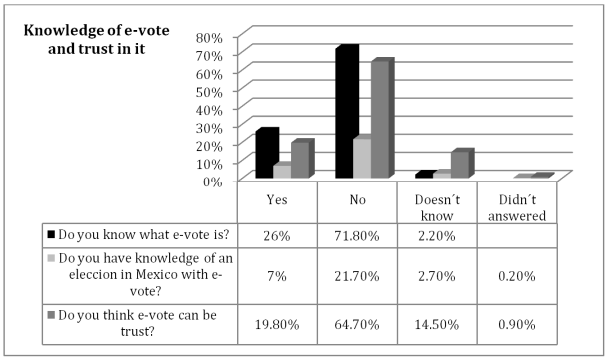
Source: Centre for social studies and Public Opinion. (2014).

It should be noted that a percentage of people similar to that that went to cast their vote in the last elections has considered going to the polls in the next election, because they add the percentages of those who have decided to vote and those who are likely to make it 57% (graphic 8), while in 2012, 59% voted. Here the presence of the dimensions of differentiation (inconsistent interpretations) and fragmentation is observed (with the presence of the interpretative ambiguity [20], because

still when they are little or not interested in the political and electoral processes, they plan to vote. And 59% of them adduced to have voted in 2012 for the presidential election [9].

Results observed in graphic 8, may reflect the awareness of citizen who answered the questions that were included in the questionnaire, since 75% of themselves, believe that things in the country are going the wrong way and 82% displayed a public safety crisis, and 75% believe that the country's course is in the wrong direction [9], nevertheless they are interested in going to the polls and through their vote express an opinion by voting. A thing that can happen is that they vote for a party other than the one in power, hoping things will improve. In this sense the Government may be challenged because unsatisfied demands represent the risk of immediate protests or future political participation in a vote of resentment that will deny re-election to the party that caused discontent [3].

However, when considering the reduction of the digital gap through access and use of ICT through social networks, the possibility of achieving greater citizen participation could be visualized, since social networks can serve as new media, communication and call, because the traditional mass-media: cinema, television, radio, newspapers, that generate public opinion support the *status quo* and, at the same time, have the domain of the public discussion [3]. Therefore only with digital literacy, access to ICT use, as well as the civic gap reduction the achievement of the population "...an active citizenship where there are spaces to achieve the symmetrical interaction between rulers and ruled [3], in fact many of the rulers, currently use Facebook and twitter to exchange messages with the citizens, this makes the distance between ones and others deemed minor.




| | Yes | No | Doesn´t know | Didn´t answered |
|---|---|---|---|---|
| Do you know what e-vote is? | 26% | 71.80% | 2.20% | |
| Do you have knowledge of an eleccion in Mexico with e-vote? | 7% | 21.70% | 2.70% | 0.20% |
| Do you think e-vote can be trust? | 19.80% | 64.70% | 14.50% | 0.90% |

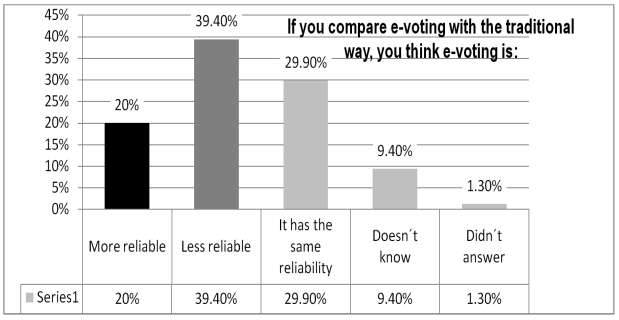
**Graphic9** Knowledge of e-vote and trust in it

Source: Centre for social studies and Public Opinion. (2014).

It is important to reduce the digital gap, because in addition to achieving the development of ICT capacity in the population, it will be in the possibility of having greater participation and interaction between rulers and ruled, and to also to attain a social meaning to the technology and the civic gap proposed by MartínezNicolás[21]; can be reduced when the citizenship is in the possibility to participate and evaluate electronic voting, after having been trained in this procedure that includes the history of these processes and the results obtained in Mexico.

This idea is based on the response that people gave to the questions included in the questionnaire, of which 74% don't know what is e-voting and only 7% claims to have knowledge of any election that was carried out in Mexico through e-voting (graph 9) which reflects the lack of information that exists about the various means through which elections are held in the country. This result shows the need of a more informed citizenry through the use of ICT and the media that allow them to interact more with the ruling and consider their points of view, all that can be achieved when a country has a literate population in ICT.

Likewise, results (graphic9) show mistrust of e-voting, since 64.7% of those who answered the questions that were included in the questionnaire said so. All of which has to do with the need for transparency and evidence of work of a public sector which reorient their way, convinced by the facts that in the Mexican Republic deprives greater safety and to demonstrate that they are working to resolve the effects of the crisis, which they claim is one of the most severe in the past 25 years. All this in order to recover the social capital that comes from trust and relationships that result in the obtaining of resources and knowledge [7].

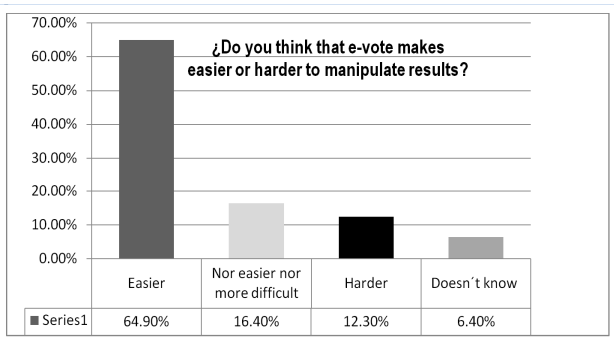



**Graphic90** Perception about the reliability of the electronic voting system

Source: Centre for social studies and Public Opinion. (2014).

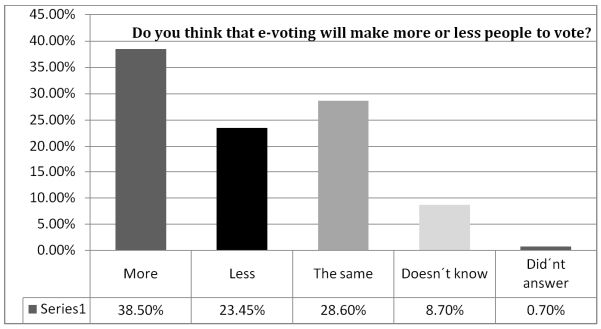
Almost 50% of those who answered the questions that were included in the questionnaire, believes that electronic voting is more or equally reliable to the traditional, although 39% view it as less reliable, moreover, 65% think they cannot thrust e-voting (Graphic 9).This answers bring out the presence of the interpretative dimensions: integration, differentiation and fragmentation in the groups and in people. The first is consistent, homogeneous, interpretations for most of people, a thing one cannot see in the results in graphic 10 in relation with graphic 9 and 11, that present inconsistency and ambiguity. Related to differentiation and fragmentation approach [20], which relates with the social complexity in the countries and territories.

So it is needed to introduce electronic voting strategically, taking into consideration these groups and their interpretations of reality, to attain the required confidence is generated and, in a not-too-distant future, it can incorporate all States, cities and communities in this process as a step towards postmodernism. Of course that the foregoing requires investment in training and equipment procurement, as well as connectivity and speed of networks, which at this time is not considered very positive according to the rate of preparation for the connectivity in the network in Mexico[28].




**Graph101** Perception about the credibility of the results with e-voting
Source: Centre for social studies and Public Opinion. (2014).

Likewise, the indicator of trust about the electronic voting system is less than 50% (graph 9), while the result that manifests itself in graph 11, again refers to the presence of the distrust of the electoral system, especially if it is through the electronic devices, where 65% of respondents see that it is easier to manipulate the results of a vote carried out through ICT. An aspect that does not favor the construction of social capital in the sense stated by Bordieu[7].




**Graphic112** Perception about citizen participation in the ballot box with electronic voting

Source: Centre for social studies and Public Opinion. (2014).

Breaking down the results and display them in a schematic way (graphic 12), allows to observe the idea that people have related to voting more or equal, and by adding these two items the result is 68% who considered positive the use of technology in order for citizens to choose their leaders. Nevertheless it is contradictory with results shown in graphics 9 and 11, because people adduce that they don´t trust e-voting and that it is easier to manipulate results using ICTs. So the interpretative presence of ambiguity and inconsistency [20] when understanding reality is present, and also reveals the complexity raises when reading results related to perception. Therefore the challenge that is present is for society and governments to construct trust and build social capital in order to satisfy with equity the demands of all groups that make up a nation.

## CONCLUSIONS

It is necessary that those who make decisions on the implementation of e-voting analyze data of access and use of technologies, so they provide the possibility that at the same time people can vote through electronic ballot boxes and traditional ones, because if e-voting is implemented at a national level in all the strata, as well as in the cities and in rural areas, it can generate fear to those who are not familiar with these media or are not digital literate, which can lead to abstentions and that inequalities between those who have access to and knowledge of the use of ICTs and those who do not, to widen.

It is important to be aware of the presence of digital divides of access and use of ICT, as well as the gap that is derived from this exclusion and citizen which lead need to consider the implementation of elections through electronic voting with:

1. Use of traditional and electronic devices in the spaces where citizens will issue their votes, so that they can choose the way they prefer to vote.
2. To establish the e-voting systems through the selection of cities, municipalities and local squares, where more than 40% of its inhabitants are competent in the use of ICT, having the option to vote the traditional way.
3. To choose, in States where there is fewer digital illiteracy, the cities where the population uses ICT and that as a federal entity does not feel excluded from this process and progress in innovation and technology in the elections.
4. To define and analyze digital illiteracy and rural areas to find ways to train citizens, so they can cast their vote electronically.
5. To make campaigns and demonstrate with facts why the use of ICT can be reliable and to find ways to reduce the gaps between citizens.

All strategies to implement electronic voting mean a challenge, since they have to be inclusive and the use of ICT should be a factor of inclusion, hence the need to build and develop forms of access and development of skills in the population, this will facilitate the construction of citizenship and, with this, access to the democracy in the country by those who inhabit it.

Achieving this will provide the use of ICT in relation to elections to have a social meaning since they may be an element of inclusion, as are used to make increasingly smaller the digital gap and, based on this, the citizen's gaps.

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