

# E-COGNOCRACY: COMBINING E-DEMOCRACY WITH KNOWLEDGE NETWORKS

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**Abstract.** We propose a new approach, *e-cognocracy*, to enrich the democratic government system with the Internet-based knowledge basis of a society. This is not a technique for voting systems to represent the parties in a democratic assembly or an e-voting procedure. It is rather a procedure to add a new dimension of knowledge to the democratic system using the Internet. This creates a new quality in the process of decision-making and consists in the creation and diffusion of the society-based knowledge. And it helps to make decisions using a scientific quantification, analysis and resolution of problems. This system of *ecognocracy* will allow the participation of all interested citizens in the process of solving highly complex problems. Such a process can also be called "participatory decision-making".

**Key words:** democracy, decision-making, knowledge society, e-voting, e government.

## 1 Introduction

Over the last decade, we have witnessed a social transformation that is the result of the development of new technologies. The emergence of the Internet (web) has transformed the behavior of individuals and organizations in the developed democracies. It is almost impossible to imagine any business or social organization that is not perpetuating their messages by using the Internet.

This new life style of the knowledge society induces a change of paradigm, motivated by the evolution in information and communication technologies (ICT) that is being introduced at great speed in all the spheres of our daily life. During the last decade

and essentially as a result of the political guidelines of the European Union<sup>1</sup>, these new technologies are being incorporated into many public administrations, into politics and, generally, into the governance of European citizens<sup>2</sup>.

Obviously, the use of the new technologies in the governance of the citizens (*e-governance*) could be limited, as is the case in other areas of business activity, to mere technical assistance in the achievement of certain objectives, in this case to facilitate the election of the democratic representatives of individuals (*e-voting*). However, modern economy is based on the so-called "Knowledge Economy", in which knowledge is seen as the product resulting from any production process, and not a side-product as some might concede. Thus, in the post-industrial society, the new technologies that work for the benefit of democracy, particularly through the Internet, must not be limited to a merely supporting role.

Turning to electronic democracy, we regard the creation and diffusion of knowledge through public discussion as the central role of the web, i.e. the inclusion of mature citizens in the public or political decision-making process. The use of knowledge in a social decision process is in the spirit of the proposals of modern scientific philosophers such as D. Diderot<sup>3</sup> and J. Habermas<sup>4</sup>.

Taking advantage of the democratic system as a vehicle of social involvement and of the web as a vehicle of communication, we present a new democratic system in the following that allows us to remedy some of the limitations of the traditional democratic system and to encourage the cognitive or fundamental process of living systems (Capra, [3]) - a process that characterizes the existence and perpetuation of the species, particularly of the human being. True electronic democracy consists of involving<sup>5</sup> citizens (something that goes beyond mere participation and discussion) in the generation and diffusion of knowledge.

The paper is organized as follows. After this brief introduction, we reflect in Section 2 on a number of the new aspects of traditional and electronic democracy. We consider various possibilities that are brought about by the new electronic technologies and that are increasingly available for the public service of democracy. In Section 3 we discuss our new views for a democratic system based on knowledge. In the last section we list our conclusions.

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<sup>1</sup> see e.g. the EU's Sixth Framework Program,

<sup>2</sup> see the priority lines 1.1.2 *Information Society Technologies* and. 1.1.7 *Citizens and Governance*.

<sup>3</sup> "The search for knowledge is the route to satisfaction". <http://www.kirjasto.sci.fi/diderot.htm>

<sup>4</sup> "Science and democracy share one style of thinking".

<sup>5</sup> The idea of direct involvement or implication is used indistinctly in this paper.

## 2 Electronic Democracy

### 2.1 Traditional Democracies

Democracy is understood as the political system in which the people exercise their sovereignty through representatives in government and parliaments and with the aim of improving their own conditions. Under this political system, and by way of universal suffrage, the people nowadays have the right to elect and control their governments on a periodical basis.

In its origins, democracy was more of a political concept defended by one camp (the democratic camp arose in opposition to the aristocratic) than a determined type of social organization. Thus, in ancient Greece the direct participation of everyone in the Popular Assembly was encouraged by the limited size of the population and by the fact that initially only those who qualified as citizens took part in the decision process.

The traditional democratic system which is aimed at organizing the governing of a society has certain limitations of the following kind:

- The participation of the citizens is limited in the majority of cases to the moment of actually electing the representatives on Election Day. Even then, in the absence of open lists, this process is often restricted to the choice of a specific political party. As such, it is a single act and not, as should be expected in self-organized dynamic systems, a continuous process of participation and improvement.
- The static voting procedure implies a low level of internal democracy as only a very limited number of a political party's members actually controls the nomination of the electoral lists. Such a process might be efficient regarding time, but it is unlikely to reflect the opinion of the voters adequately. The free choice of the citizens is distorted, because there is an a priori filtering of the candidates by party representatives. In such circumstances, the voting is limited to a *pro-rata* exercise between the candidates fixed by the party "functionaries".
- The current democratic system gives no consideration to those individuals who do not vote, whilst those that deposit a blank ballot paper, usually as a protest against the system, are viewed as part of that system. Indeed, these votes are taken into account to reinforce the role of the majority groups. The system tries to perpetuate itself over time, establishing barriers to entry<sup>6</sup> (minority groups) and carrying out a feed-back exercise with the creation or generation of new "figures" or political leaders and their legitimization.

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<sup>6</sup> When speaking of the generation of knowledge it is a mistake to forget the minority groups, given that the "discovery" of truth and knowledge is usually a specific act, carried out by an individual and not by a group.

- Political parties can abuse the confidence placed in them by their voters. After Election Day, parties can pursue objectives that are not declared in their electoral manifestos. These are hidden interests that sometimes govern the behavior of these parties, or at least of some of their members. In certain extreme situations, it could even be a minority group whose goals are clearly in conflict with those of the majority of the party representatives (or deputies in the chamber) who actually decides on sensitive questions.
- In the present democratic elections, control over the activities of politicians is limited to control their mandate: This is done by casting a vote in regular intervals at the occasion of an election. Many citizens find this unappealing, given that today we are creating a global society that has the potential of a much broader basis of knowledge. Political interventions can be conducted through the Internet if the preference structures of individuals are rapidly changing or slowly evolving (this characterizes the dynamic character of preferences). Except for Switzerland, the only Western direct democracy, control over the democratic system is exercised at election days that are regularly spaced over time.
- Societies without democracy might have disadvantages in competition in the long run and there might even be *social opportunity costs* from not using the full spectrum of democratic participation. The new possibilities of e-democracy can be used for more ambitious objectives than simply electing representatives. Thus, most present democratic systems can be viewed as static since they are not using the dynamics of democratic discussions and participations, such as individual responsibilities, dialogue, the search for and the dissemination of knowledge, the strengthening of ethical and moral values, or learning and education.

## 2.2 Internet and Democracy

During the last decade, we have witnessed a dramatic change in our society by two events: first, the information basis has changed through the Internet; second, the value system of western societies is more driven by ecological concerns and sustainable economic growth.

Technological development has been incorporating itself in all these social ambits. In the particular case of democracy, there have been a number of proposals aimed at using the web to facilitate the election process of democratic representatives (*e-voting*). In this case, aspects relating to security and confidence in the communication and treatment of information are essential for the system in order to have any credibility. To encourage such a social perception, it would be highly appropriate if the web allowed individuals to verify the traces left by the voting process. In this regard, it would be sufficient if the citizen could confirm that the vote cast indeed corresponded to the option chosen.

Furthermore, the web can be used to make democratic decision processes more transparent. Internet access improves political communications and the accessibility of political representatives and parties for their citizens. Some smaller nations in Europe are already taking advantage of the new possibilities. The government of Estonia prepares and governs their weekly sessions through connected laptops.

But also the control of governments can be made more democratic through the Internet. It enables the voter to check and learn about the agenda of the parliamentary sessions regularly and "on-line". Similarly, the interested voter can inform him- or herself on the meetings of representative bodies. Parties in the era of Internet-searching voters have already adapted to the new information challenges: political parties have installed on-line information and offer communication between citizens and their political representatives. A recent election for presidency in Austria (in April 2004) has shown that candidates keep their supporters and voters informed by a diary which was kept up to date every day during the election campaign.

When we speak of the search for knowledge, this should be understood as the search of substantial or relevant knowledge for each new decision case. Such information takes into account that the relevant knowledge of any "small world" decisions is closely related to the knowledge of "large world" decisions. Internet based searches for decision helps will show that many smaller problems are immersed in a larger world with larger problems, i.e., that a deeper knowledge usually helps to clarify one's process of making a decision.

Thus, a modern democratic system should develop decision-making tools that will allow us to study the patterns of political behavior of all the groups involved. The extraction and diffusion of common knowledge is closely related, as Habermas [7] indicates, to the ideal line of thinking in modern democracies.

### 3 E-cognocracy

We discuss a new democratic approach that is based on the use of the Internet and reflects the evolutionary nature and a certain holistic view of our society. We would like to give the name "*e-cognocracy*" to this approach which can be characterized by the following points:

1. Citizens can choose between different styles of how to participate in democratic systems. This will continue the existing practice of placing votes of confidence for a political party : traditionally by urn voting, recently by *e-voting*; or citizens involve themselves directly in the solving of problems, contributing opinions and ideas that will allow for an improvement in our knowledge of the process of decision-making followed by the system (*e-cognocracy*).
2. Parliamentary seats will be distributed in two parts: (i) one occupied by the traditional political parties as is usually the case (the parties' part) and (ii) the other part is reserved for those citizens who wish to be directly involved in



the democratic process (the citizens' part). The percentage assigned to these two parts of the parliament is a critical parameter of the new procedure: A significant part of a successful public implementation will depend on the political attention as how this threshold parameter is selected. In principle, a value in the interval between 60% and 80% for the parties' part and the rest for the citizens' part seems to be reasonable. There is no reason why these values should be static, as is the case with preferences, given that they can be adapted in line with the interest shown by the citizens in this form of participation. In any event, it is suggested that there is a minimum of 50% for the parties' part.

3. Not all the themes have to be solved by a mandatory participation of all the citizens. As we know from some existing legal systems, criminal charges can be tried by a popular jury in certain circumstances, but in others not. Something similar could be possible here. The selection of topics and questions that will be discussed and decided in the process of *e-cognocracy* is another important aspect of the proposal. Both, the number and frequency of the questions that will be posed for decisions by a specific group, as well as the type and contents, will be crucial elements of the political system. The political culture of a country will have an important role in the implementation of such a new democratic proposal.
4. The direct involvement of citizens in political decision-making is orientated towards the improvement and diffusion of social knowledge. Also the proposed topic and the wish of expanding knowledge relative to the scientific method will be important for the resolution of the problem. In order to begin such a new political process, consideration could be given to the proposals made by the traditional parties, and thereafter, with the help of a "*facilitator*", that is to say, by a specialist in scientific decision-making. Thus, it would be possible to propose and prepare decision problems, and to extract the knowledge relevant to the political learning process.
5. This relevant knowledge of the problem refers to patterns of behavior, preference structures, stylized facts and trends. As a starting point in the search for consensus between the parties (political parties and groups of involved citizens), we could think in terms of obtaining an initial preference structure which reflects what is common in the opinions of the actors involved, that is to say, the nucleus with respect to some attribute considered in the problem (for example, the consistency referred to in Moreno-Jiménez et al., [15]).
6. The resolution of the problem will eventually consist in the ranking of a set of discrete alternatives, from amongst which either the best alternative or a set of alternatives would be selected. To deal with these types of situations it is necessary that we employ a multi-criteria framework that allows for the resolution of problems with multiple scenarios, criteria and actors, and in which the incorporation of the intangible and subjective aspects is fundamental to the resolution of the problem.

*E-cognocracy* is characterized by the following points:

- a) It allows for the direct involvement of the citizens, thereby potentially endorsing their participation in the democratic system.
- b) It improves the control of the political system, it could reduce unintended influences and dependencies on minority groups, as there will always be a margin of votes to be won in each problem and moment in time. This will lead to more extensive coalitions between groups which, in turn, will favor more centrist and majority-supported positions.
- c) It improves the overall knowledge of the system, strengthens the discussion and the debate of ideas and leads to more negotiations and search for consensus processes. Although the final solution is directed towards more centrist and less extreme positions from a practical point of view (the world of realities), this is not the case from a theoretical point of view (the world of ideas). Here the improvement of knowledge can emerge from postures that are in total confrontation, which, in turn, will favor learning, given that a larger conceptual spectrum is thereby made available.
- d) It brings together people interested in a continuous knowledge “formation” process. One of the objectives of Rawlsian social justice [21] is the equality of social opportunities. Of course, there will be individuals who do not wish to participate in the system, and it is questionable whether they should be obliged to do so. Such continuous formation processes should allow for equality of opportunity for all those who show an interest in it.
- e) It permits the easy expansion and diffusion of knowledge, as well as the creation of certain minimum ethical standards and the consideration of more sustainable lifestyles. All this is favored by the actuality and interest of the themes being debated, which will help in spreading the ideas and values that emerge from the discussion.
- f) The proposal is not a new one to discuss or alter representations in democratic systems, but follows the line of the approval voting of Brams and Fishburn [2] which could be extended to a more general situation where the intensity of the approval is involved. This approach imposes rather a radical change to the orientation given to these systems. Thus, instead of searching for the election of representatives, what is sought is the creation and diffusion of knowledge derived from scientific decision-making in the government of the citizens.
- g) The multi-criteria framework proposed to deal with the specific part (direct involvement of the citizens) allows the voter to be incorporated in the decision process through values and judgments. Here we should note that the objective treatment of the subjective will challenge scientific research on such procedures. As Bernard Roy [22] points out, this scientific character will be given by the rigor, transparency and accessibility of the method applied.

With respect to the two basic processes (*e-discussion* and *e-voting*, which constitute e-democracy), *e-cognocracy* adds a third one, *e-cognition*, which is oriented towards the extraction and diffusion of knowledge (learning) in the decision making process. Following the constructive approach, or the European school of decision analysis (Roy, [22]), we incorporate a new step in the traditional resolution process of multi-criteria models in order to learn about the processes and procedures involved (this can be viewed as the “value added” of knowledge).

Obviously, when it comes to the use of computers and the Internet in any process of decision-making, a number of questions arises with respect to data-security in the web and the security of the system, something that can be nowadays solved by new technical standards like the electronic signature<sup>7</sup>. Properties such as authenticity, integrity, and confidentiality should be perfectly guaranteed through the use of appropriate tools such as the PKI (Public Key Infrastructure)<sup>8</sup>. In this sense, Simon French [5] suggests that the necessary attributes of this type of system are competence, objectivity, justice and consistency.

#### 4 Conclusions

If there is one key factor in the cultural and social transformation through which mankind has been passing during the last quarter of the 20<sup>th</sup> century, then it is the development of new electronic technologies. This new type of influence that information and communication technologies are having on the behavior of individuals, organizations, or systems transforms our society.

To analyze the major societal challenges in Europe, the Sixth Framework Program of the European Union has established several priority research lines which are currently explored by trans-national research projects<sup>9</sup>. The results of these projects will contribute directly to realizing European policies for the Knowledge Society<sup>10</sup>, as was agreed by the European leaders at the Lisbon Council of 2000, the Stockholm Council of 2001, and reflected in the e-Europe Action Plan<sup>11</sup>.

Following this line of thinking, and in accordance with the new challenges for the Knowledge Society of the 21<sup>st</sup> Century, this paper has formulated the general ideas for a new democratic system, called *e-cognocracy*. As well as allowing for a greater integration of the citizens in their own governance, and in accordance with the most recent evolutionist theories, the aim of this proposed system is to direct the citizens' efforts towards one of the essential activities of human living systems: the creation and diffusion of knowledge referred to the decision making process followed by the system, and the procedures employed by it in the scientific resolution of the problem under consideration.

<sup>7</sup> Several European states (e.g. Austria) have already introduced such laws to encourage e-business and e-voting.

<sup>8</sup> [www.gao.gov/new.items/d04157.pdf](http://www.gao.gov/new.items/d04157.pdf)

<sup>9</sup> 1.1.2 Information Society Technologies (IST); 1.1.7 Citizens and Governance;...

<sup>10</sup> [www.masie.com/masie/researchreports/learning0700nate2.pdf](http://www.masie.com/masie/researchreports/learning0700nate2.pdf) (by B.R. Rutenbur et al.)

<sup>11</sup> [http://www.cimu.gov.mt/documents/e\\_europe.pdf](http://www.cimu.gov.mt/documents/e_europe.pdf)



In the context of the Knowledge Society and of e-governance, this new democratic system, *e-cognocracy*, offers a new platform for the direct participation of the citizen in governance. This new organizing approach is oriented towards the education of society in values related to participatory and spatially distributed democratic and science-based decision-making.

In this sense, it is necessary to develop new decisional tools, such as scenario planning, advanced visualization, web accessible group support systems and general decision-making tools, etc., that improve the transparency of the process. More attention must be given to the articulation of individuals' conflicting interests, the communication between the actors involved in the resolution process and the effectiveness, efficacy and efficiency of the negotiated processes.

Our views are based on four main characteristics. First, they incorporate the new developments of the science of decision-making, that is to say, the inclusion of the subjective, the intangible and the emotional, with special emphasis being placed on the human factor. Secondly, they use the multi-criteria decision-making paradigm as its methodological support (see Moreno and Polasek [18]). Thirdly, as operational support, our approach offers a series of decisional tools which are implemented in interactive decision support systems and connected in networks. It allows taking advantage of the potential offered by the new technologies to facilitate the tasks faced by individuals and systems as regards their own management and government. Finally, it favors the development of socially recognized and pursued values, such as knowledge, freedom, peaceful coexistence, formation, participation, self-governance and European integration (meaning the elimination of geographical, cultural, political and technological barriers).

In this sense, the research line followed in this paper opens the way to one of the areas of multidisciplinary collaboration with the brightest future in the ambit of the knowledge society, that is to say, the integration of decision support systems, multi-criteria techniques and citizens' e-governance. In summary, we seek to develop tools which - orientated fundamentally towards the human factor and its full participation in the Information Society - make it possible for all individuals to gain access to a multitude of services and applications and, in general, to knowledge. This requires the integration of communication and computer networks in a context of barrier-free technologies and easy-to-use human interfaces.

Obviously, there are many questions, both technical and philosophical-methodological, which remain open and need further detailed consideration. From a technical point of view, the decisional tools (including data mining, artificial intelligence, simulation, prediction, visualization...) are employed in knowledge management (Tissen et al. [23]). The spectrum is quite wide: it runs from its extraction up to its representation and, finally, its exploitation, and must be studied in greater detail than is possible in this purely precursory, motivating and introductory work.

From a more philosophical point of view, there is a fundamental element in the success of any social innovation process such as the one that is proposed here. If, in general, a society and its leaders are often resistant to structural changes, then they

will be also less enthusiastic about a system change that involves two important pillars of powers: representation and knowledge.

The implications of an *e-cognocracy* system have a direct effect on politicians, since *e-cognocracy* tries to change the quality of the democratic representation and the transparency of the decisions. This process involves the creation and diffusion of public knowledge that is characteristic of *e-cognocracy*. This element could have an unfavorable impact on the group which must finally present and approve, if this is the case, the proposal. The fact that our politicians must approve a new political procedure that has a direct effect upon their future position will have a big impact on the acceptance of the new system.

This process should be accompanied by a program that will educate citizens, their leaders and, in general, the society at large, in order to support the feedback in self-organized dynamic systems. The use of public knowledge in an enlarged political process of political participation and decision-making is the road towards social progress, which we considered as an evolutionary step in a life-long continuous process of learning.

For this purpose, we suggested in Moreno and Polasek [18] the multi-criteria framework as a way to deal with the modeling and resolution of complex problems. Similarly, in the context of one of the most widely used multi-criteria techniques, namely the analytic hierarchy process (AHP), we propose some decisional tools (*analytic* and *informatic* tools) orientated towards searching for the relevant knowledge associated with the decision making process and the procedures employed within it. This process of knowledge transmission will be reflected in political behavior, trends, education, and decision making, and can be the starting point of a consensus-oriented negotiation process. It could be a new way to solve problems of high complexity more effectively than in our current democratic system.

We would like to end our essay with the motto:

*There is no democracy without freedom; there is no freedom without knowledge.*

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