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# Effectiveness of e-cognocracy: a social-economic approach

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**Universidad**  
Zaragoza

Tesis Doctoral

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**UNIVERSIDAD DE ZARAGOZA**

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**Universidad**  
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**EFFECTIVENESS OF E-COGNOCRACY.  
A SOCIAL-ECONOMIC APPROACH**

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Doctor of Philosophy in Economics

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*Love what you do and  
you will give the best of yourself.*

*To my parents*



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# INTRODUCCIÓN

Desde que a comienzos del siglo XXI se fijó en Lisboa el plan estratégico de la Unión Europea (Lisboa, 2000), tendente a conseguir que esta zona sea la más competitiva en la conocida Sociedad del Conocimiento (SC) (Bell, 1973; Drucker, 1969, 1994; Faure et al., 1972; Stehr, 1994; UNESCO, 2005), uno de los términos que más interés está despertando es el de Gobierno Electrónico (e-Gobierno). Este concepto se encuentra en constante estado de evolución y se ha convertido en una expresión que abarca multitud de actividades e intentos de innovación y modernización en el campo de la gestión pública (Wimmer, 2002). Layne and Lee, (2001) afirman que un objetivo importante del e-Gobierno es la prestación de servicios e información más rápidos y más baratos para los ciudadanos, socios comerciales, empleados, otros organismos y agencias gubernamentales. Estos autores también propusieron una evolución del gobierno electrónico de cuatro etapas: (1) la catalogación; (2) la transacción; (3) la integración vertical y (4) la integración horizontal.

Los representantes elegidos por el pueblo deben aprovechar el uso de las TIC para acercarse a la sociedad, fomentar la participación democrática, contribuir a una buena administración y mejorar la efectividad, la eficacia y la eficiencia de las Administraciones Públicas. En abril de 2010, Moreno-Jiménez propuso la aproximación EF3 (EF3-approach) a la hora de abordar el comportamiento de los sistemas, la cual contempla las siguientes ideas: a) la efectividad, asociada a la planificación estratégica o comportamiento a largo plazo y a la detección de los criterios relevantes para la resolución de un problema (hacer lo correcto); b) la eficacia asociada a la planificación táctica o comportamiento a medio plazo y a la consecución de las metas marcadas para los objetivos fijados y c) la eficiencia asociada a la planificación operativa o

comportamiento a corto plazo y a la consecución de las metas con la mejor asignación de recursos posibles (hacerlo correctamente).

En síntesis, lo que se postula es lograr un nuevo tipo de gestión de lo público empleando convenientemente el uso de las TIC y que, además de garantizar la eficacia (satisfacer las necesidades de los ciudadanos), y la eficiencia (optimizar los recursos) del sistema, los modelos de intervención democrática se centren en su efectividad.

Aprovechando el continuo desarrollo de la tecnología, también es necesaria una profunda reflexión sobre la orientación que debe tener la democracia en el futuro y las posibilidades que ofrece la red. En los últimos años, la consideración del ser humano en un contexto holístico y sistémico y la utilización de la búsqueda del conocimiento como criterio esencial que guíe el comportamiento de los individuos y de los sistemas, han llevado a la búsqueda de alternativas democráticas que recojan estas ideas (Moreno-Jiménez, 2006).

Para construir ese futuro es preciso la mejora de las democracias actuales o habilitar nuevos modelos democráticos que, aprovechando el potencial de la Sociedad del Conocimiento, puedan dar respuesta a los nuevos retos y necesidades que en ella se plantean. En este sentido, la e-Cognocracia (Moreno-Jiménez 2003, 2004, 2006; Moreno-Jiménez y Polasek, 2003, 2004, 2005), es un nuevo modelo de democracia que combinando la democracia representativa y la directa permite: i) la co-creación en las diferentes etapas de la metodología científica utilizada en la resolución de los problemas planteados en el ámbito de las decisiones públicas referidas al gobierno de la sociedad, ii) la co-decisión entre ciudadanos y representantes a la hora de seleccionar la mejor opción, y iii) la cognición a través de la formación continuada de la ciudadanía mediante la democratización del conocimiento derivado de la resolución científica del problema<sup>1</sup>.

Este nuevo sistema democrático utiliza la decisión multicriterio como soporte metodológico, la red como soporte de comunicaciones y el sistema democrático como elemento catalizador del aprendizaje. Además, pretende potenciar la participación y el

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<sup>1</sup> El papel del conocimiento como motor de progreso ha sido resaltado por numerosos autores (Marshall, 1972; Prusak, 1997).

## *Introducción*

control de los ciudadanos en las decisiones públicas, así como mejorar la transparencia de los procedimientos seguidos. Las decisiones siguen siendo tomadas por la mayoría de la ciudadanía, pero a diferencia de lo que ocurre en la democracia representativa, la e-Cognocracia, además de no excluir ninguna idea del proceso de resolución, potencia la creatividad e innovación de los ciudadanos (Moreno-Jiménez, 2003).

Durante la última década, la inclusión de los ciudadanos en la toma de decisiones políticas a través de la participación electrónica (e-Participación) ha recibido mucha atención. Macintosh (2004) definió este concepto como el uso de las TIC para ampliar y profundizar la participación política de los ciudadanos, para que puedan conectarse entre sí y con sus representantes electos. Con el uso de las TIC en la participación ciudadana se ha empezado a ver un cambio en la misma. Es un cambio de cultura y de hábitos cotidianos, un cambio en la manera de relacionarse y de observar el mundo que les rodea.

En el marco de esta tesis, la e-Participación puede aplicarse, en general, a los dos ámbitos contemplados en la Administración Pública (Moreno-Jiménez, 2009): (i) provisión de servicios (e-Administración) y (ii) participación política en los procesos democráticos (e-Gobernanza). No obstante, tradicionalmente, la e-Participación se ha venido asociando exclusivamente al último ámbito de los dos considerados: la participación política o e-Gobernanza en su sentido más amplio (participación en la toma de decisiones públicas relativas al gobierno de la sociedad).

Con esta interpretación de la e-Participación, la e-Cognocracia puede considerarse como un nuevo modelo de participación, y por lo tanto incluida en la misma, pues uno de sus objetivos es una toma de decisiones pública colaborativa.

Cada vez se habilitan más espacios donde los ciudadanos pueden participar en la definición, gestión y desarrollo de la agenda institucional. Este hecho ha provocado que la participación ciudadana se esté convirtiendo en uno de los grandes desafíos a los que se enfrentan los gobiernos del XXI. Es por ello, por lo que las Administraciones deben, necesariamente, incrementar el nivel de información disponible, y al hacerlo ponen a disposición de la ciudadanía más herramientas para el seguimiento, el control y la evaluación de las políticas públicas.

La participación ha de tener una traslación en términos prácticos, de manera que los ciudadanos puedan constatar su incidencia y sus resultados. De esta manera, es conveniente desarrollar procedimientos de evaluación conjunta y participada, para poder medir el alcance y el impacto de una experiencia de e-Participación. La evaluación no sólo permite visualizar los resultados de una iniciativa y el grado de cumplimiento de los objetivos propuestos sino que expresa una voluntad de rigor, transparencia, análisis y mejora continuada que refuerza la consistencia y credibilidad de las experiencias participativas.

Con la evaluación se pretende realizar un análisis lo más riguroso posible acerca de las distintas etapas y resultados alcanzados por las experiencias de e-Participación, de tal forma que se pueda determinar, entre otros aspectos, la efectividad, la eficacia, la eficiencia (EF3-approach) así como el impacto económico, social y ambiental de las acciones.

Aunque la importancia de la evaluación de una iniciativa de e-Participación es reconocida por el gobierno y el mundo académico, las evaluaciones rigurosas de e-participación son difíciles de encontrar (Macintosh and White, 2008).

La evaluación ex-post de una experiencia de e-Participación nos permite analizar el impacto que ha tenido ésta, así como el análisis de la utilización práctica de los instrumentos de participación. Además, nos sirve para conocer qué modificaciones podrían ser necesarias a efectos de poder mejorar, desde el punto de vista de la efectividad, eficacia y eficiencia, las actividades futuras.

Además, estas iniciativas participativas, llevan asociado un coste económico, que en la mayoría de los casos está financiado con fondos públicos, por lo que sería conveniente la valoración de las mismas, con el fin de ser, ante todo, transparente y consecuente con los objetivos estratégicos perseguidos, ya que éstos, deberían ser verificables y demostrables económica y socialmente. De esta manera, se presenta la necesidad de cuantificar, monetariamente, tanto los aspectos económicos, sociales y ambientales, como el valor añadido generado de la aplicación práctica de este tipo de iniciativas de e-Participación (Pérez Espés et al., 2012).

Para poder dar una respuesta apropiada a los nuevos retos y necesidades que en el ámbito de las decisiones públicas relativas al gobierno de la sociedad, plantea la

## *Introducción*

Sociedad del Conocimiento, se propone el desarrollo de esta tesis Doctoral: *Efectividad de la e-Cognocracia. Una aproximación económica-social.*

El principal objetivo de esta tesis es establecer un marco general que permita la evaluación, en términos de efectividad, eficacia y eficiencia, de una experiencia de e-Participación basada en la e-Cognocracia. Así mismo, se extenderá para la evaluación de cualquier experiencia de e-Participación. Además de valorar, en términos monetarios, los aspectos económicos, sociales y ambientales, de la implementación y el desarrollo de una experiencia de e-Participación basada en la e-Cognocracia. Esta valoración permitirá, disponer de información económica y social relativa al verdadero valor añadido que aportan estas iniciativas a la sociedad en general.

A continuación, en los dos apartados siguientes, se detallan la metodología aplicada para abordar los objetivos propuestos y la estructura seguida en el desarrollo de esta tesis.

### **Metodología:**

Para la elaboración de esta tesis se va a emplear una metodología mixta, a través de los desarrollos teóricos basados en los resultados obtenidos de nuestro caso de estudio: la experiencia real llevada a cabo en Cadrete (Zaragoza, España). A continuación, se presenta el caso de estudio y las técnicas aplicadas.

### Caso de estudio:

Para la consecución y el logro de los objetivos propuestos, se utiliza como caso de estudio: la experiencia de e-Participación (basada en la e-Cognocracia) para el diseño de políticas públicas llevadas a cabo en Cadrete. Esta iniciativa fue realizada a lo largo del 2010 dentro del proyecto investigador multidisciplinar “Gobierno Electrónico, e-Participación y Democratización del Conocimiento” que, bajo la dirección del profesor Moreno-Jiménez fue ejecutado por un grupo de 41 personas, entre las que se encuentra la autora de esta tesis. Este municipio forma parte, junto al Gobierno de Aragón y el Ayuntamiento de Zaragoza, del conjunto de instituciones que habitualmente colaboran en la línea investigadora del Grupo Decisión Multicriterio Zaragoza.

La justificación de la elección de esta experiencia de e-Participación como caso de estudio, se centra, fundamentalmente, en que es la única experiencia completa de aplicación de la e-Cognocracia (tema principal de la tesis) y que fue elaborada por el GDMZ por lo que disponemos de los datos de la misma.

Técnicas aplicadas:

i) Modelos de Ecuaciones Estructurales (MES):

Se crea un marco teórico basado en la EF3-approach para la evaluación de la e-Cognocracia. Este marco llamado teórico EF3-marco (theoretical EF3-framework) es evaluado a través de una encuesta implementada en la experiencia real llevada a cabo en Cadrete usando MES. Debido al número limitado de respuestas, no fue posible validar el marco teórico propuesto (Moreno-Jiménez, Pérez Espés and Rivera, 2013) para la evaluación conjunta de todos los aspectos definidos en el theoretical EF3-framework. Sin embargo, esto nos ha permitido aprovechar las ideas extraídas para extender el marco para evaluar cualquier experiencia de e-Participación no sólo la e-Cognocracia.

ii) Grupo de expertos:

La extensión del theoretical EF3-Framework ha sido evaluada por un grupo de expertos internacionales a través de un cuestionario. EF<sup>3</sup>-framework es el nombre del marco validado por los expertos.

iii) Técnicas de Decisión Multicriterio

El EF<sup>3</sup>-framework se aplica a nuestro caso de estudio (la experiencia de Cadrete). Para valorar esta iniciativa se utiliza la técnica de decisión multicriterio denominada Proceso Analítico Jerárquico (AHP).

iv) Aproximación económico-social (SROI- Social Return on Investment<sup>2</sup>)

Se realiza una aproximación social-económica a través de la metodología del SROI, la cual nos permite cuantificar, monetariamente, los aspectos económicos, sociales y ambientales, de la implementación y desarrollo de una iniciativa de e-

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<sup>2</sup> Retorno Social de la Inversión

## *Introducción*

Participación basada en la e-Cognocracia. Así como, disponer de información económica y social relativa al valor añadido que aportan estas experiencias.

### **Estructura**

Esta tesis doctoral está dividida en dos partes. La primera se compone de dos capítulos donde se analiza el marco teórico para el estudio del gobierno de la sociedad y los modelos de democracia. El primer capítulo analiza el impacto que han tenido las TIC en el gobierno de la sociedad y en la gestión pública, así como el desarrollo que está teniendo la aparición del concepto del e-Gobierno en la Administración Pública y el alcance en la sociedad. Mientras que el segundo capítulo se centra en los diferentes modelos de democracia existentes hasta la fecha, haciendo más hincapié y explicando de manera detallada el nuevo modelo de democracia propuesto por José M<sup>a</sup> Moreno en el año 2003 bajo el nombre de *e-Cognocracia*.

La segunda parte está formada por dos capítulos empíricos. En el tercer capítulo, se estudia la relación entre e-Participación y e-Cognocracia y se presenta un marco (EF3-framework) para la evaluación, en términos de efectividad, eficacia y eficiencia, de cualquier experiencia de e-Participación. La iniciativa de Cadrete es evaluada y valorada siguiendo el marco EF3 propuesto en dicho capítulo. Y en el cuarto y último capítulo se valora, monetariamente, la implementación y el desarrollo de la experiencia de Cadrete. Esta valoración nos permite, a través de la comparación de los beneficios económicos y sociales con la inversión realizada, tener una visión global sobre el verdadero valor añadido que aportan las iniciativas de e-Participación a la sociedad.



# **INTRODUCTION**

Since the European Union set out its Lisbon Strategy at the beginning of the XXI century (Lisbon, 2000) with the aim of making this zone the most competitive in the Knowledge Society (KS) (Bell, 1973; Drucker, 1969, 1994; Faure et al., 1972; Stehr, 1994; UNESCO, 2005), one of the terms that has aroused the most interest is that of Electronic Government (e-Government). This concept is in a state of constant evolution and has become an expression that encompasses a multitude of activities and attempts to innovate and modernize the field of public management (Wimmer, 2002). Layne and Lee, 2001 affirms an important goal of e-Government is the delivery of faster and cheaper services and information to citizens, business partners, employees, other agencies, and government agencies. Besides, these authors propose a four-stage evolution: (1) cataloguing; (2) transaction; (3) vertical integration and (4) horizontal integration.

The representatives elected by the people must make use of ICT to bring themselves closer to society, foster democratic participation, contribute to a good administration and improve the effectiveness, efficacy and efficiency of Public Administrations. In April 2010, Moreno-Jiménez proposed the EF3-approach for studying the behavior of systems, which contemplates the following ideas: a) effectiveness, which is associated with strategic planning or long-term behavior and which investigates aspects relevant to the resolution of a problem (doing what is right); b) efficacy, which is associated with tactical planning or medium-term behavior and is related to measuring how well the goals set are achieved; and c) efficiency, which is associated with operational planning or short-term behavior and measures the best possible allocation of public resources (doing things correctly).

In sum, it postulates a new type of public management that uses ICT adequately and that models of democratic intervention, as well as guaranteeing the efficacy (satisfying citizens' needs) and the efficiency (optimization of resources) of the system, should focus on its effectiveness.

Taking advantage of the continuous development of technology, a deep reflection is also required about the orientation that democracy should adopt in the future and the possibilities offered by the Web. In recent years, the consideration of the human race in a holistic and systemic context, and the search for knowledge as an essential criterion to guide the behavior of individuals and of systems, have led to the search for democratic alternatives that reflect these ideas (Moreno-Jiménez, 2006).

To construct that future, it is necessary to improve present democracies or to enable new democratic models that, making use of the potential of the Knowledge Society, can answer the challenges and necessities it proposes. E-Cognocracy (Moreno-Jiménez 2003, 2004, 2006; Moreno-Jiménez and Polasek, 2003, 2004, 2005) is a new model of democracy that, combining representative and direct democracies permits: i) co-creation in the different stages of the scientific methodology used in the resolution of the problems proposed within the ambit of public decisions referring to the governance of society, ii) co-decision between citizens and representatives when selecting the best option, and iii) cognition through the continuous education of the citizenry by means of the democratization of knowledge derived from the scientific resolution of the problem<sup>3</sup>.

This new democratic system uses multi-criteria decision making as its methodological support, the Web as its communications support and the democratic system as its catalyst of learning. Furthermore, it aims to foster citizen participation and control in public decisions and to improve the transparency of the procedures followed. Decisions are still taken by the majority of the citizenry but, as opposed to what happens in representative democracy, e-Cognocracy, as well as not excluding any idea from the process of resolution, foments the creativity and innovation of the citizens (Moreno-Jiménez, 2003).

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<sup>3</sup> The role of knowledge as a driver of progress has been highlighted by numerous authors (Marshall, 1972; Prusak, 1997).

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During the last decade, the inclusion of citizens in political decision making through electronic participation (e-Participation) has received much attention. Macintosh (2004) defined this concept as “*the use of ICTs to broaden and deepen the political participation of citizens, so they can connect with each other and with their elected representatives*”. With the use of ICT, a change has begun to be seen in citizen participation. It is a change in citizens’ culture and daily habits, a change in the ways they interact and in how they observe the world around them.

In the framework of this thesis, e-Participation can be applied, in general, to two spheres of Public Administration (Moreno-Jiménez, 2009): (i) service delivery (e-Administration) and (ii) political participation in democratic processes (e-Governance). Nevertheless, e-Participation has traditionally been associated exclusively with the latter, political participation or e-Governance, in its widest sense (participation in public decision making that refers to the governance of society).

With this interpretation of e-Participation, e-Cognocracy can be considered as a new model of participation and, therefore, can be included within e-Participation because one of its objectives is collaborative public decision making.

More and more spaces are being provided where citizens can participate in the definition, management and development of the institutional agenda. This fact has meant that citizen participation is becoming one of the greatest challenges for XXI century governments. For this reason, Administrations must, necessarily, increase the level of information available and, in doing so, provide citizens with tools for following, controlling and evaluating public policies.

Participation must be translated into practice so that citizens can see its incidence and results. In this way, it is convenient to develop procedures of joint participative evaluation in order to be able to measure the reach and impact of an e-Participation experience. Evaluation not only allows the visualization of the results of an initiative and the degree of fulfillment of the objectives proposed but also expresses a willingness for rigor, transparency, analysis and continuous improvement that bolsters the consistency and credibility of participative experiences.

Evaluation seeks the most rigorous analysis possible of the different stages of and the results obtained from e-Participation experiences so that, among other aspects, the

effectiveness, efficacy and efficiency (EF3-approach), as well as the economic, social and environmental impact of the actions taken, can be determined.

Although the importance of the evaluation of e-Participation initiatives is recognized by government and academia, rigorous evaluations of e-Participation are hard to find (Macintosh and White, 2008).

The ex-post evaluation of an e-Participation experience allows us to analyze the impact that this has had and to analyze the practical use of the tools of participation. It also helps us know what modifications may be necessary for improving future activities from the point of view of effectiveness, efficacy and efficiency.

These participative initiatives also have an economic cost, financed in most cases with public funds, so it would be convenient to evaluate them with the aim of being, above all, transparent and consistent with the strategic objectives pursued because these objectives should be economically and socially verifiable. Thus, it is necessary to quantify, monetarily, both the economic, social and environmental aspects, and the value added generated by the practical application of this type of e-Participation initiatives (Pérez Espés et al., 2012).

This doctoral thesis, "*Effectiveness of e-Cognocracy. An economic-social approach*", is intended to give an appropriate answer to the new challenges and necessities in the sphere of public decisions that arise within the Knowledge Society.

The main objective of this thesis is to establish a general framework that permits the evaluation, in terms of effectiveness, efficacy and efficiency, of an e-Participation experience based e-Cognocracy. Also, it will be extended to the evaluation of any experencia e-Participation. Moreover to value, in monetary terms, the economic, social and environmental aspects of the implementation and development of an e-Participation experience based on e-Cognocracy. This evaluation will allow us to obtain the economic and social information as to the true value added that these initiatives contribute to society in general.

In the following two sections, the methodology applied to tackle the objectives proposed and the structure followed in the development of this thesis will be detailed.

**Methodology:**

For the elaboration of this thesis is employed a mixed methodology, through theoretical developments based on the results of our case study: the real-life experience carried out Cadrete (Zaragoza, Spain). Next, the case study and applied techniques is presented.

Case study:

To achieve the objectives proposed, the e-Participation experience (based on e-Cognocracy) for the design of public policies carried out Cadrete is used as a case study. The initiative took place during 2010 within the multidisciplinary research project “Gobierno Electrónico, e-Participación y Democratización del Conocimiento” that, directed by Professor Moreno-Jiménez, was carried out by a group of 41 people, including the writer of this doctoral thesis. This municipality forms part, together with the Government of Aragón and the Council of Zaragoza, of the group of institutions that habitually collaborate in the research of the Zaragoza Multicriteria Decision Making Group.

The reasons for choosing this e-Participation experience as a case study are, fundamentally, that it is the only full initiative of implementation of e-Cognocracy (the main topic of this thesis) and was developed by the GDMZ so they have the all data.

Techniques applied:

i) Structural Equation Models (SEM):

A theoretical framework based on the EF3-approach for the evaluation of e-Cognocracy was created. This theoretical EF3-framework was first evaluated through a survey implemented in the real-life experience of Cadrete using SEM, or the Covariance Structure Analysis approach. Due to the limited number of responses, it was not possible to validate a general framework for the conjoint evaluation of all the aspects outlined in the theoretical EF3-framework (Moreno-Jiménez, Pérez Espés and Rivera, 2013). However, it allowed us take advantage of the extracted ideas to extend this framework to evaluate any e-Participation experience, not only e-Cognocracy.

ii) Group of experts:

The extension of the theoretical EF3-Framework was validated by international experts through a questionnaire. The validated framework was called the EF<sup>3</sup>-framework.

iii) Multi-criteria Decision Making Techniques

The EF<sup>3</sup>-framework was applied to our case study (the Caderete experience). To evaluate this initiative, the technique of multi-criteria decision making called the Analytic Hierarchy Process (AHP) was used.

iv) Social-economical approach (SROI- Social Return on Investment)

It is performed an social-economical approach through the SROI methodology that allows the monetary quantification of the economic, social and environmental aspects of the development of an e-Participation initiative based on e-Cognocracy and to obtain the economic and social information about the value added that these experiences provide.

## **Structure**

This doctoral thesis is divided into two parts. The first comprises two chapters in which both the theoretical framework for the study of the government of society and models of democracy are analyzed. The first chapter analyzes the impact that ICT have had on the government of society and on public management as well as the development of the concept of e-Government in the Public Administration and its impact on society. The second chapter focuses on the different models of democracy that have existed to date, highlighting and explaining in detail the new model of democracy proposed by José M<sup>a</sup> Moreno in 2003 under the name of *e-Cognocracy*.

The second part consists of two empirical chapters. The third chapter studies the relationship between e-Participation and e-Cognocracy and presents a framework (the EF3-framework) for the evaluation, in terms of effectiveness, efficacy and efficiency, of any e-Participation experience. The Cadrete initiative is evaluated and scored through the application of the EF3-framework proposed in the same chapter. The fourth and final chapter assesses, in monetary terms, the implementation and development of the

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Cadrete experience. This valuation allows us, through the comparison of the economic and social benefits with the investment carried out, to obtain a global vision about the true value added that e-Participation initiatives provide to society.

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# **CHAPTER 1:**

## **THE GOVERNMENT OF SOCIETY AND THE PUBLIC ADMINISTRATION**

### **1.1 INTRODUCTION**

In recent years, there has been an interesting debate about the adequacy of the traditional democratic model, based on the government of the people through political parties, following the principle of one person, one vote (García Lizana and Moreno-Jiménez, 2008), and about the most appropriate form of government in today's society.

The study of the forms of government adopted by human societies is nothing new; it has been a concern of social scientists throughout history. Plato (427-347 B.C.) based his theory on a complex casuistic, considering both the number and type of agents that intervene as well as their motivations and attitudes (Plato, 1981). But more important than the classes or models employed in political action is the link established between social functioning and the nature of individual beings as the foundation of his dynamic analysis of society. Following Plato, it can be affirmed that we find a set of human developments, of an evolutionary character, that respond to certain patterns influenced by the nature of human beings (García Lizana and Moreno-Jiménez, 2008).

Ibn Jaldún (1332-1406) is an author who studied the interpretation of social functioning integrating aspects of politics, economics, etc. into his analysis. This philosopher based his theory on the non-linear character of social functioning. He states that the human being will only be capable of governing the evolutionary process adequately when they have an adequate knowledge of its underlying dynamics, understood as new scenarios that occur in society due to non-linear periods of rises, falls, recoveries, etc. Coinciding with the ideas of Plato and Ibn Jaldún, an important question, essential for the effective organization of society, is the consideration of the dynamic, evolutionary and self-organized character of human societies. The forms of government are not arbitrary or voluntaristic, but respond to the processes of change that societies go through conditioned by human nature itself and by the circumstances that exist at each moment. Consequently, it is necessary to identify what these changes have been and the extent to which they affect the existing model of government. Only then will we be in a position to propose new forms of government that allow us to overcome and rectify the contradictions and limitations of the ancient models of democratic representation (García Lizana and Moreno-Jiménez, 2008).

It is evident that, in recent years, ever more accentuated simultaneous transformations are taking place in the traditional values of the western world along with modifications in technological foundations, in business perspectives, etc. The question arises as to whether all of this has been the fruit of a certain modification of political behaviour or whether, independently of this, we, the citizens, are in a position to suggest a more suitable and viable model of government, capable of leading us toward the construction of a better and more educated society.

This chapter, with the aim of providing a clear view of the current situation, analyses how the emergence of a series of philosophical, methodological and technological changes at the end of the XX Century has led to the appearance of new necessities (Moreno-Jiménez, 2003b). Moreover, it analyses the fundamental role of ICT within the framework of the New Public Management (NPM) and of the New Public Governance (NPG) for achieving the objectives of greater effectiveness, efficacy and efficiency in the workings of the public sector. Finally, the literature on *e-Government or electronic government* is studied.

## 1.2 PUBLIC ADMINISTRATION

### 1.2.1 Problem statement

The increase of the presence and intervention of the State in the last one hundred years, especially in the industrialized countries was, fundamentally, due to the need to recover from the terrible damage caused by the Great Depression<sup>4</sup> and the post-World War II period in the economic and social systems. Its most evident consequence has been a change in direction focused, on one hand, on the extension of institutional capacity (from the qualitative not the quantitative point of view) and, on the other, on the efficacy of state action to attend to the needs of the population and the correct functioning of the markets (Fernández et al., 2008).

The World Bank considers that the State, or more generically the public sector, is necessary to achieve sustainable growth both in the economic and social fields, which implies that an effective state is indispensable for the presence of the goods and services –and the norms and institutions- that make it possible for markets to prosper and for people to have a healthy and happy life. To this should be added the consideration that the State is fundamental for economic and social development, not as a direct agent of growth but as a partner, catalyzing element and driver of this process (World Bank, 1997).

The United Nations Public Administration Network (UNPAN)<sup>5</sup> states that the public sector is *a notion used in both policy and legal sciences. From a legal perspective, it means the persons and organizations engaged in the fulfilment of public tasks, dealing with the delivery of goods and services to citizens, in response to their needs and problems, under liability and discretion of public authorities and under public law and/or with public funds and/or under formalized public control and regulation.*

Another of the fundamental reasons why the public sector is indispensable is that it, and/or the entities that make it up, have to provide the necessary bases for the

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<sup>4</sup> The "Great Depression" was a worldwide economic crisis that began in October 1929 with the collapse of the New York Stock Market and lasted throughout the thirties, being especially intense until 1934.

<sup>5</sup> <http://www.unpan.org/DPADM/ProductsServices/Glossary/tabid/1395/language/en-US/Default.aspx> (seen on 12th May 2013)

economic community to be able to improve its competitiveness in a global economy. Some of the aspects in which this sector is fundamental are: in the elemental training of human capital, in the improvement of communications infrastructures, in the agility in decision making and the efficacy and efficiency in the delivery of services and in their management (Ministerio de Administraciones Públicas-MAP 2000, cited in Fernández et al., 2008).

In spite of this necessity, there is a considerable consensus with respect to the idea that the functioning of the Public Sector has developed a series of dysfunctions that have resulted in a lack of adaptation of public organizations to the current socioeconomic context. This has led to a rise in the demand from citizens for public responsibility (Fernández et al., 2008) and, at the same time, to the Public Administration considering the need for a deep reform of itself. This has meant shifting from being a classist or assistance-oriented Administration, based on the delivery of a series of directly managed (and supposedly free) benefits and services, to an Administration much more in line with the present global context, that is, a citizen-oriented Administration (Hufty, 1998). In today's society, the citizens demand, among other things, in exchange for their taxes, more information, a larger number of products and services of better quality, and an increase in the efficiency of the management of resources.

In conclusion, it means shifting from an administrative culture of spending to one of cost-awareness, from the culture of monopoly to one of competition, from a culture of the citizen-servant to one of the citizen-client, from a culture of bureaucracy to one of adaptation, of flexibility, of concern for productivity and quality in the delivery of services. All this requires the Administration to be competitive in the market (Vivas Urieta, 1998 cited in Fernández et al., 2008).

Cunill sustains that this transformation of the Public Administration consists of the replacement of bureaucratic methods by market-oriented methods for the delivery of goods and services produced by the government. Therefore, it means setting up markets for most public services, separating the design of policies from the delivery of services (Cunill, 1997). Baena (1993) states that it corresponds to Public Administrations to

elaborate and execute the decisions of political bodies at each administrative level, the line dividing political and administrative decisions always being very subtle.

According to the United Nations Development Programme (UNDP)<sup>6</sup>, *Public Administration has two closely related meanings: (a) The aggregate machinery (policies, rules, procedures, systems, organizational structures, personnel and so forth) funded by the State budget and in charge of the management and direction of the affairs of the executive government, and its interaction with other stakeholders in the State, society and external environment; (b) The management and implementation of the whole set of government activities dealing with the implementation of laws, regulations and decisions of the Government and the management related to the provision of public services.*

All the quotes above are the result of an increased concern on the part of the client of both the public sector and the distinct levels of the Public Administration, with the aim of seeking a greater adaption of public services to the needs of the citizen, with a satisfactory degree of quality in their delivery (OCDE, 1997).

This shift of focus of the Public Administration, denominated as New Public Management by Hood (1991), has awoken an interest that goes beyond national level. Various international public organisms have become involved in the matter, including the International Monetary Fund (IMF), the World Bank (WB) and, in particular, the Organization for Economic Cooperation and Development (OECD). All this will be dealt with in Section 1.3 of this chapter.

### **1.2.2 Principles of Public Administration**

We have previously defined the concept and the functions of the Public Administration. The Spanish Constitution imposes a series of principles on which the organizational power of the Administration should be based. These principles are contained in article 103 and in the Ley de Régimen Jurídico y del Procedimiento Administrativo Común (LRJPAC) (precisely in article 3).

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<sup>6</sup> <http://www.unpan.org/DPADM/ProductsServices/Glossary/tabid/1395/language/en-US/Default.aspx> (seen 12th May 2013)

Article 103 of the Constitution states that “*the Public Administration objectively serves the general interest and acts in accordance with the principles of efficacy, hierarchy, decentralization, deconcentration and coordination, in complete compliance with the Law...*”

#### **1.2.2.1 Principle of objectivity**

Objectivity is understood in the sense of impartiality. In article 103 of the Spanish Constitution, it is stated that “*the Public Administration objectively serves...*”. Impartiality is connected with the principle of the interdiction of arbitrariness recognized in article 9.3 of the Spanish Constitution.

With the aim of guaranteeing the objectivity of the Administration, some predetermined rules have been established for the production of administrative acts, namely, the rules of administrative procedure.

#### **1.2.2.2 Principle of public interest**

All administrative activity is based on the search for the public interest. This interest is a common interest that benefits an important part of the members of the social body.

#### **1.2.2.3 Principle of efficacy and efficiency**

Efficacy acts as an essential principle for administrative action seeking quality of services and good economic management. This principle will make sure that the Administration fulfils the goals established in the various public services delivered to the citizens.

Efficiency, which complements efficacy, has an economic significance that implies optimization in the use of the human and material resources for the achievement of the goals proposed and improvement in the quality of the services delivered.

#### **1.2.2.4 Principle of hierarchy**

The administrative organization is structured hierarchically with a multiplicity of organs.

Two conditions have to be met for this principle to be fulfilled: first, the existence of a plurality of competent organs and, second, that the highest level organ should

prevail over the inferior ones in order to direct and substitute their will with the aim of reaching the necessary administrative unity and of obtaining the desired results.

#### **1.2.2.5 Principle of decentralization**

The principle of administrative decentralization involves the transference of functions from one organization to another, each with its corresponding juridical personality with the fundamental aims of bringing the levels of decision closer to those administrated and of trying to avoid the dysfunctions inherent in excessive centralism through a distribution of power.

#### **1.2.2.6 Principle de deconcentration**

Administrative deconcentration is understood to be the process of the permanent transference of titles and the exercise of competencies from a higher organ to a lower one, within the same public entity.

#### **1.2.2.7 Principle of coordination**

Coordination is an organizational principle that seeks to achieve unity in administrative activities between different Administrations or between organs belonging to different areas of one Administration, not related to the principle of hierarchy.

The types of coordination are the following:

a) Coordination between administrative organs:

This concerns the establishment of coordination techniques between the organs of one Public Administration and, if necessary, with those of another administrative organization through organic and functional techniques. The organic techniques consist of the existence of permanent specific organs with a clear a coordinating function.

b) The coordination of local entities by the State and by the Autonomous Communities:

Article 10.1 of the law called Ley 7/1985 Reguladora de las Bases del Régimen Local (LRBRL) states that the Local Administration and other Public Administrations will adjust their reciprocal relations to the duties mutual

information, collaboration, coordination and respecting their corresponding fields of competencies.

c) The coordination of the State and the Autonomous Communities:

The General Administration of the State coordinates with the Administration of the Autonomous Communities through the Government Delegate (article 154 of the Spanish Constitution). Typical mechanisms of collaboration between the State and the Autonomous Communities include sectorial conferences aimed at coordinating within the field of administrative activities and bilateral commissions of cooperation to deal with matters of interest between the State and a particular Autonomous Community.

#### **1.2.2.8 Principle of legality**

Article 103 of the Constitution establishes the maximum normative level of the link between the Public Administration and the Law in terms of compliance, the latter understood as compliance with the whole of the legal system because it involves both parliamentary and administrative regulations, not only norms with the formal status of Law.

#### **1.2.2.9 Principio de equality**

The principle of equality is imposed on the Public Administration by article 14 of the Constitution. All administrative activity must be based on the equality of everyone before the law, both materially and formally, with respect to its repercussions on liberty and on private property. Furthermore, access to assistance and to public services should be permitted without the existence of unjustified discriminations.

#### **1.2.2.10 Principle of good faith**

The principle of good faith is included in article 3 of the law called Ley de Régimen Jurídico y del Procedimiento Administrativo Común (LRJPAC). This establishes that the relations between the Public Administration and the citizens are regulated by the principle of good faith, in other words, it seeks the maintenance of citizen trust in the Administration, for which the latter should maintain in its conduct the expected attitude of rectitude, both juridically and ethically.

### **1.2.2.11 Principle of cooperation**

The law called Ley de Régimen Jurídico y del Procedimiento Administrativo Común (LRJPAC) in its article 3.2. states generally that, “*Public Administrations, in their relations, will be guided by the principle of cooperation.*”.

Cooperation is a form of voluntary coordination between various public entities that possess autonomous power and interact from a position de of equality to achieve their objectives.

Public Organizations convey to society principles and values through public policy and modernizing processes that sometimes involve technological, organizational and procedural changes with significant impacts on society (Arenilla et al., 2014). Through these mechanisms, a democratic administrative system must contribute to the existence of a healthy social structure in aspects such as equality, solidarity, rationality, harmony, virtue and responsibility (Yun, 2006).

In this way, public administration builds citizenship, conveys certain values and beliefs and organizes living space according to the principles of the dominant ideology of the moment (Arenilla et al., 2014).

## **1.3 NEW PUBLIC MANAGEMENT (NPM) AND NEW PUBLIC GOVERNANCE (NPG)**

In the framework of NPM and NPG, ICT play a fundamental role in achieving the goals set by the Public Administration, especially goals in the field of governance that aim toward greater transparency and accountability on the part of politicians and more citizen participation and control. Furthermore, ICT have the potential to change management practices and even the hierarchy and organizational culture of public entities (Schelin, 2003 cited by Royo 2008), ultimately contributing to the reinvention of government (Osborne and Gaebler, 1992; Bellamy and Taylor, 1994a, 1994b; Muid, 1994; Heeks, 2002; Ho, 2002)

In the last decades of the XX century, a new model of management arose in the public sector in response to the criticisms directed at the Traditional Public

Administration (TPA) that was based on Weberian theory. This new model was known as NPM and rapidly expanded internationally. The TPA was characterized by the application of the principle of legality and the establishment of a bureaucratic administration that sought efficiency and rationality in the resolution de procedures (Pérez et al., 2011).

In recent years, public sector reforms, with the objective of increasing the legitimacy of the Administration in the eyes of the citizens, have basically focused on aspects related to improvements in public services and accountability to society (Pollitt and Bouckaert 2000; Hernes, 2005). These reforms (carried out in numerous countries) were based, at least until the end of the 80s, on concepts of NPM and, recently, of Post-New Public Management.

The name New Public Management (Aucoin, 1990; Hood, 1990, 1991, 1995; Broadbent and Guthrie, 1992; Dunleavy and Hood, 1994; Lynn, 1998; Pollit and Bouckaert, 2000; Keating, 2001; Hughes, 2003) refers to the movement of Public Administration reforms that was born in Anglo-American countries in the 80s. This movement was directed at the implantation of management systems that allow the creation of an effective and efficient administration to attend to the requirements of citizens and to deliver quality services (Hood, 1991; Osborne and Gaebler, 1992). In this context, accountability and transparency become fundamental axes towards achieving the trust of citizens, who are the main stakeholders in this model, and promoting the establishment of models that encourage citizen participation.

Some authors have analysed the components of NPM reforms. Hood (1991) was of one them and, grouping various perspectives, enumerated the elements commonly accepted by most of them: greater disaggregation of public organizations, more competition, emphasis on private sector management styles, a growing interest in discipline and parsimony in the use of resources, direct professional management, the establishment of objectives and performance evaluation in public entities, and greater emphasis on the control of outputs.

In general, NPM reforms were based on three economic theories: agency theory, public choice theory and transaction cost theory (Hood, 1991; Pollit and Bouckaert, 2000; Giaque, 2003).

i) Agency Theory

Agency Theory explains the difference found in the private sector between the objectives of the managers (agents) and the shareholders (principals) of the firm. The divergences between the interests of the agents and the principals have given rise to numerous publications in the literature about questions related to accountability and to the effects of this behaviour on organizations. Marston and Polei (2004) affirm that agency costs (fall in the value of the entity and costs of supervising the actions of the management) may occur whenever managers do not act in the interests of the shareholders but try to favour their own.

Agency Theory analyses, in economic terms, the relationships between principals and agents. The aim is to establish systems of incentives so that agents will act coherently with the objectives of the principals. Therefore, contracts must exist that stipulate the rights and obligations of the agents to assure that the behaviour of the managers is in accordance with the wishes of the principals.

The application of Agency Theory in the public sector has focused fundamentally on aspects related to accountability (Mayston, 1993). The relations between the Administration and the citizens can be considered an agency relationship because the citizens have put their trust in a certain group of people that govern in their name (Royo, 2008).

In the case of the public sector, the agency problem is compounded by the fact that the principals do not possess adequate means for guaranteeing that the agents fulfil their obligations (Hughes, 2003). Moreover, in this context, it is difficult to identify who the principals are and to find out what it is they really want. In principle, the principals of the public function are considered to be the population in general, but their interests are so diverse that an effective control by the agents (public managers) is unlikely. At the same time, the motivation for obtaining profits does not exist in the public sector (Hughes, 2003).

Laswad et al. (2005) affirm that it has been proven that the agency relations that exist in the public sector create incentives for public managers to supply voluntary information that allows external agents to evaluate the management carried out.

ii) Public Choice Theory

Public Choice Theory is a branch of economic thought that tries to explain the behaviour of politicians on the basis of their interest in maximizing their benefit, represented by the possibility of being elected (Buchanam, 1967), thus establishing a nexus between economic and political science.

Therefore, accepting this theory, the main types of reforms that appear are: the introduction of competition and the possibility of choosing between different suppliers of goods and services for the activities traditionally in the hands of the public sector, and the transfer of activities to the private sector (Royo, 2008). However, after years of applying this theory in the Administration, the results obtained have not been conclusive because, as Hughes (2003) points out, markets do not always work better than the traditional bureaucratic structures.

iii) Transaction Cost Theory

Transaction Cost Theory is the last of the economic theories within NPM. Elaborated by Oliver E. Williamson, it questions the premise that transactions have no associated cost and specifies the circumstances in which an entity may prefer to outsource an activity rather than carry it out internally (Williamson, 1986). According to the author, there are two ways to coordinate economic activity, through the market and through the firm.

Transaction Costs appear in markets that do not fulfil the characteristics of markets of perfect competition. They can be defined as the costs associated with an economic interchange that vary independently of the market price of the goods or services interchanged. They also include all costs associated with the search for and the obtaining of information about goods and services and supervision costs (Nicholson et al., 2006).

Williamson (1975) affirms that economic transactions are organized in different structures, markets or hierarchies mainly, depending on the model in which greater cost savings are achieved. With economies of scale or of scope, markets can offer lower production costs, so market imperfections can result in prohibitive transaction costs that impede the arrival of supplies to the market (Nicholson et al., 2006).

This theory, the same as the previous two, has provided a theoretical argument to justify a greater use of market-type mechanisms, privatisations of public entities and the outsourcing of activities to the private sector, alleging the greater efficiency of these structures compared to the traditional bureaucratic organizations (Royo, 2008).

### **Limitations and new tendencies**

The reform processes implanted within NPM have met with some criticism which includes an excessive decentralization, diffuse vertical control, a lack of horizontal coordination between the organizational units, a strong focus on results and management evaluation and a distancing from the overall vision of citizen welfare (Arellano and Cabrero, 2005; Christensen and Lægreid, 2007ab; Christensen et al., 2008; Diefenbach, 2009; Jun, 2009).

Faced with these difficulties, a process of criticism and revision of NPM has been initiated, the main fruit of which has been the development of new approaches that can be grouped under the denomination of Post-New Public Management reforms. The principal goal of post-NPM reforms has been to gradually counteract the disintegration or fragmentation brought about under NPM and to restore public sector organizations to a situation of better integration and coordination (Christensen and Lægreid 2007b).

Within the framework of the Post-New Public Management reforms, one of the control instruments proposed is the so-called Whole of Government (WG), known in its beginnings as «joined-up government». This concept is defined as a set of responses to what is considered an excessive fragmentation of the public sector, fostering the structural reorganization of the public administration so that it can cooperate and work together to improve both its vertical and horizontal coordination with the aim of offering a more integrated service to citizens (Pollitt, 2003a-2003b). From a cultural point of view, WG tries to strengthen values such as trust, collaboration and teamwork and to improve the training and self-development of civil servants (Christensen and Lægreid, 2007a-2007b). The post-NPM generation of reforms advocates a more holistic strategy (Bogdanor, 2005).

At the same time, another current is influencing how public administrations are managed: Governance. This new theory advocates providing the administration with a system of responsibility and trust with respect to its main stakeholder, the citizens (Cadbury, 2000). To do so, it is necessary to refocus the concept of client-citizen (established in NPM) because the idea is to promote greater transparency and responsibility as well as more openness and citizen participation. At present, work is being carried out, in line with the joined-up government and WG models, on the composition of integrated public services based on collaboration and coordination between public organisms (Kernaghan, 2009). Digital technology is becoming a way of achieving integrated and coordinated services and public administrations (Dunleavy et al., 2006).

The word *governance* comes from the French *gouvernance*, which first appeared in the XV century. At the end of the XVII century, it began to be used in the Anglo-Saxon world and, since then, its habitual use is synonymous with the exercise of power, the activity of the government. Its use has spread to all international organizations and to academic and intellectual areas. Governance can be studied as a concept that aims to go “beyond” politics and the public sphere (Rosenau and Czempiel, 1992), a new way of governing (Mayntz, 2001) or a new direction. All this reflects the academic debate that this term produced in the 1990s and that led to a great variety of meanings (Conejero, 2012).

We are, thus, in the face of an emerging paradigm, Governance, that is, a form of government understood as: *the social coordination of collective action by systems of norms and order* (Mayntz, 1993).

The European Commission (2001)<sup>7</sup> defines the governance of Europe as a concept that implies not only the action of governing or directing the running of government institutions, but also as a particular way of exercising that governance. It presents a catalogue of good intentions such as: legitimate government, responsible government and competent government that is respectful of human rights and the law.

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<sup>7</sup>Communication of the Commission, 25 July, 2001, “European governance –A white paper”

From this point of view, the concept of governance can be understood as a model of public administration whose main objective is to bring citizens closer to institutions and politicians by means of greater citizen participation and different networks of stakeholders (Conejero, 2012).

Another perspective considers governance as part of the development of the knowledge society (KS) (explained in detail in the following section). José M<sup>a</sup> Moreno-Jiménez (2006) associates the term governance with political participation in public decision making with respect to the Government of Society (see Section 1.7.2). Taking into account the fact that the most relevant of the characteristics of the KS is the importance of the human factor, governance models in the KS should be oriented (Moreno-Jiménez, 2006) towards educating people (intelligence and learning), promoting relations with others (communication and social harmony), improving society (quality of life and cohesion) and facilitating the conjoint construction of the future in a world of increasing complexity. In order to educate people in the context of the KS, governance models should focus on the extraction and diffusion of knowledge related to the scientific resolution of public decisional problems (Moreno-Jiménez, Pérez Espés and Wimmer, 2013).

The democratisation of this knowledge is the main aim of *New Public Governance* (NPG). Global values such as discussion, dialogue, the search for and dissemination of knowledge, the strengthening of ethical and moral values, learning, accountability, freedom, cohesion, equity, solidarity and education should be promoted in new models of democracy for the KS (cognitive democracies) (Moreno-Jiménez, Pérez Espés and Wimmer).

The NPG and efficiency-oriented approaches to management contemplate the administration as a service provider. However, the significant progress implied by these theories, the assimilation of the citizen as a client of public services and the offer made to him/her to participate in creating value for society (Arenilla and García, 2013) are not sufficient to achieve the legitimacy of public authorities. The reason is that the political nature of the administration is reduced by the lowering of the status of the citizen from a legitimizer of the political system to a simple service consumer (Arenilla et al., 2014).

The determination of the most appropriate model of governance for addressing the needs and challenges of a given epoch is by no means an original topic of debate and discussion (García Lizana and Moreno-Jiménez, 2008).

The existence of different reforms implanted in the Public Administration can be appreciated, though they do not mean the complete abandonment of the structures and characteristics of previous models (Dunn and Miller, 2007). This leads us to the conclusion that the different administrations will be able to take their stance by adapting the various techniques and tools offered by the diverse management models. Therefore, each administration will need to analyse the possible alternatives and the different possibilities they offer, as well as the diverse experiences in other countries of adapting and implementing the measures they find most adequate (Jun, 2009).

#### **1.4 THE KNOWLEDGE SOCIETY**

As was mentioned at the beginning of this chapter, during the final years of the XX century, there were a series of philosophical (from mechanistic reductionism to evolutionary holism), methodological (from the search for truth to the search for knowledge, understood as the interpretation of the information in a specific domain (Moreno-Jiménez and Mata, 1992)) and technological (communication networks) changes that led to the appearance of new needs and social values (Moreno-Jiménez, 2003b).

Today, we face challenges related to the existence, development and perfecting of human societies. Furthermore, in the case of democracy, we find that it is being questioned because it has not been able to adapt itself to the new times, especially to phenomena such as globalization and technological change. These two aspects have favoured the appearance of a system of human relations (the virtual and global community) that uses the WWW and the Internet as its bases of communications.

*A knowledge society is a society that is nurtured by its diversity and its capacities.* The idea of the information society is focused on technological breakthroughs. The

concept of knowledge societies includes much broader social, ethical and political dimensions (UNESCO, 2005).

There are two outstanding characteristics in today's society, known as the Knowledge Society (KS): the human factor and interconnection. This new society, unlike its predecessor (the Information Society), because it explicitly considers the human factor, because of the deterritorialization that has occurred with the development of ICT and given that it belongs to a digital environment based on knowledge, should be capable of integrating the objectivity of classical science with the subjectivity of human behaviour, and the local with the global, that is, of respecting and taking advantage of the differentiating aspects of things local and of integrating them into a global aim fundamentally directed at the creation and social diffusion of knowledge (Moreno-Jiménez, 2006).

*A knowledge society must foster knowledge-sharing, as well as being able to integrate all its members and to promote new forms of solidarity involving both present and future generations. Nobody should be excluded from knowledge societies, where knowledge is a public good available to each and every individual (UNESCO, 2005).*

The second highlighted aspect, interconnection, refers to a technical question associated with ICT but which is, fundamentally, a philosophical question that reflects the new vision that the individual has of her context and of her interaction with herself. It reflects the holistic vision of reality. The interconnection of the actors with the context is the interconnection of the local with the global, of the individual with the universe, in sum, of the parts with the whole. It requires the use of networks and hierarchies that permit: a) integrating the very small with the very large; b) capturing the dynamism of reality, including the dynamic preferences of the actors and their interrelations; c) incorporating uncertainty; d) interdependencies among factors; e) facilitating the search for consensus, cooperation and dialogue and, lastly, f) favouring the learning process, or the cognitive process, vital in living systems. (García Lizana and Moreno-Jiménez, 2008).

If the information society (IS) (XX century) was based on written texts and on the information technology of the eighties (management information systems—MIS— and decision support systems—DSS—), the knowledge society is based on the use of

communication networks as the instrument to favour relationships between individuals<sup>8</sup>. A type of society is taking shape that no longer tends so much toward information, as the tangible representation of data and ideas processed for the final user, but towards knowledge, understood as a cognitive process where the information is contextualized around an individual and her circumstances, that is applied to decision-making and problem-solving (Abram, 1999).

Whereas the IS sought prediction and control, the KS seeks comprehension, communication and consensus (Moreno-Jiménez, 2003b). The idea is to foment relationships with others to solve the problem of how to live together in an ever more complex world (Bechelloni, 2000).

The difference between the IS and the KS (Galindo Cáceres, 2000) is that the former is organized by rigid relationships and structures between its actors that inhibit creativity and initiative so the information for creation only flows in one direction. On the other hand, the KS has a mixed structure, with strong horizontal forms that counterbalance the vertical forms and permit agreements and interaction among peers in a staggered hierarchical structure that, at each step, facilitates a certain autonomy and independence.

The KS (a space for human ingenuity) seeks, in short, to foster communication, interconnection and interaction among people, to encourage learning and the development of intelligence (Moreno-Jiménez, 2004). In this type of society, technology, more than being a mere artefact, should be conceived as a socio-technical system that implies new forms of social organization (Colina, 2000).

Translated into economic terms, the capacity of the IS, as we are defining it (in terms of prediction and control and of fomenting relations between agents), promotes the general functioning of the system, improving the results in terms of productivity and competitiveness. But the fostering of communication, interaction, creativity and initiative provided by the KS has, without doubt, a capacity of impact that is qualitatively differentiated and more intense in quantitative terms. The structuring of the staggered relationships through the communications networks, which has its highest

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<sup>8</sup> Pineda de Alcázar (2003) cited by García Lizana and Moreno-Jiménez, 2008.

manifestation in digital and virtual networks like the Internet, makes possible a greater fluency of communication, not present in written texts, that leads to a multi-interactivity in real time where many subjects participate with different points of view and from diverse places, opening horizontal links to multiple contacts (García Lizana and Moreno-Jiménez, 2008).

## **1.5 ICT AND THE GOVERNMENT OF SOCIETY**

The great necessity of governments to streamline, flexibilize, optimize, and make more transparent the processes and/or activities of the public system, has motivated the use of ICT in the development of ever more complex applications.

The Public Administration acts in an environment renovated by the new paradigm organized around ICT. This new paradigm constitutes the basis of a new type of relationship: network relationships.

It has been necessary to reformulate the system, taking the new digital tools of the World Wide Web (WWW) as the working platform. These tools facilitate the production and assembly of information products generated by governmental entities at low cost.

Furthermore, the use of information technologies in Public Administrations has made important transformations possible both in administrative support tasks and in the very concept of the State. For many years, both public and private entities have undergone technological changes that affect their management. Public Administrations have been obliged to change the structures and parameters of their functioning as a result of the growing use of ICT (Heeks, 2002; Ho, 2002). At present, they are immersed in a process of transformation in service delivery, in their interactions with citizens and in the modernization of the management of internal administrative procedures at the general level, hiring, internal management, economic management, accounting, etc.).

Heeks (2002) identifies five possible areas in which ICT can contribute to the reform processes of Public Administrations:

*Effectiveness of e-Cognocracy. A social-economic approach*

1. Lower cost: produce the same level of *output* at a lower total cost.
2. Greater quantity: produce more *output* for the same total cost.
3. Higher speed: produce the same level of *output*, for the same total cost, but in un less time.
4. Better quality: produce the same level of *output*, for the same total cost, in the same time, but with a higher level of quality.
5. New products or services: obtaining new *outputs*

The first three refer to an improvement in the efficiency of public entities while the last two imply an improvement in efficacy.

Apart from the material requirements necessary for the general implementation of communication technologies (efficacy and efficiency), Public Administrations should also pursue the effectiveness of the system (subsistence of the species) and not so much the efficacy and efficiency<sup>9</sup> of the system, which are not strictly democratic values (Moreno-Jiménez, 2006).

In the context of the European Union, the introduction of ICT has led governments to impose numerous juridical obligations on firms with respect to the information supplied to Internet users. Two examples of this are article 5 of the Directive 2000/31/EU on e-commerce and, in Spain, article 10 of Law 34/2002, of 11 July, on services of the information society and e-commerce.

The public powers try to facilitate the participation of and openness to citizens and to provide public information through electronic media, unlike in the private sphere where the objective is, fundamentally, to foment economic transparency and good corporate governance. (In Spain, at state level, article 1 of Law 11/2007, of 22 June “*recognizes the right of citizens to interact with Public Administrations by electronic means and regulates the basic aspects of the use of information technologies in administrative activities, in relations between Public Administrations and in relations between citizens and Public Administrations with the aim of guaranteeing their rights, a*

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<sup>9</sup> Moreno-Jiménez, 1997, understands effectiveness as the detection of the relevant criteria for the resolution of a problem (doing what is right). Efficacy is achieving the goals that are fixed by means of setting the objectives (achieving goals). And efficiency is achieved through the best possible assignation of public resources (doing things correctly)

*common treatment from these Administrations and the validity and efficacy of the administrative activity in conditions of juridical security.”* Article 3 lists the objectives of this law:

1. “To facilitate the exercise of rights and the fulfilment of duties through electronic media.
2. To facilitate citizen access through electronic media to information and to administrative procedures, with special attention to the elimination of the barriers to this access. necessary
3. To create conditions of trust in the use of electronic media, establishing measures for the preservation of the integrity of fundamental rights, especially those related to intimacy and personal data protection, by guaranteeing the security of systems, data, communications, and electronic services.
4. To promote proximity to the citizen and administrative transparency, as well as a continuous improvement in the pursuit of the general interest.
5. To contribute to the improvement of the internal functioning of the Public Administrations, increasing their efficacy and efficiency through the use of information technologies with the due legal guarantees in the execution of their functions.
6. To simplify administrative procedures and provide opportunities for participation and greater transparency with the due legal guarantees.
7. To contribute to the development of the information society within the framework of the Public Administrations and in society in general.”

Nevertheless, these objectives, with respect to transparency and participation, are not supported by any real development in the content of the law and do not go much beyond establishing means of access to public information through electronic media such as electronic official bulletins, websites and electronic documents and archives (Articles 10 to 12). Furthermore, they imply the recognition of the electronic version of the classical rights recognized in the Law of the juridical regime of Public Administrations and in the common administrative procedure with respect to the relations between citizens and the Administration (article 6), such as the right to obtain

information, to make enquiries, claims and requests, to express consent, to file actions, to carry out payments and transactions and to express opposition to resolutions and administrative acts.

All the above questions often face numerous inconveniences, both technical and administrative, that must be eliminated by the Administration in order for them to become a reality, at least in general terms.

Information technologies should contribute the decisive element of modernization to Public Administrations both in the process of interaction with the citizen and in the improvement of the quality of services as well as in internal procedures (accounting, administrative and others), with increased productivity, a reduction in time and operative costs, traceability of management and of information, etc.

As a consequence, a need arises for the public powers to face the challenge of balancing the rights of all citizens in the use of ICT so that they do not contribute to increasing, rather than decreasing, social inequalities and to prevent them from being used for illicit purposes.

Obviously, it will be necessary to offer society technological conditions through which all individuals can intervene directly (in conditions of equality), without producing a *digital divide*<sup>10</sup>. Moreover, it will be crucial to guarantee the technological safety of the Internet and the juridical safety of its management as well as to create a climate of citizen trust in electronic government (Moreno-Jiménez, 2006).

A correct use of ICT by the public powers can affect all fields of participation. They can be used to provide better information, to increase transparency and accountability, to improve public service delivery, to facilitate the exercise of civil liberties, to create networks and associational fabrics, to manage the different phases of participative processes (from information to decision making) and to generate citizen knowledge.

The representatives elected by the people must take advantage of the use of ICT to move closer to society, foment democratic participation, contribute to a good

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<sup>10</sup> The digital divide is an expression that refers to the socioeconomic differences between communities that have access to ICT (Servon, 2002a) and to their ability to use them effectively according to their different levels of literacy and technological capacity (Maggio, 2007).

management and improve the effectiveness (doing the correct thing), the efficacy (reaching goals) and the efficiency (doing things correctly) of Public Administrations. In other words, the public powers, by means of an adequate use of ICT, can further democracy and improve their relationships with citizens through public participation using electronic media.

The Government and the Administration must face the risks that new technologies imply, but they must also make maximum use of the multiple possibilities they offer to advance towards a better-educated, more democratic, fairer, more equitable and, in short, freer and more participative society.

To sum up, the aim is to achieve, through the adequate use of ICT, a new type of public management that, as well as guaranteeing the efficacy (satisfying citizens' needs) and the efficiency (improving costs) of the system, focuses the models of democratic intervention on their effectiveness<sup>11</sup>. To avoid committing (Aguarón et al., 1997) the well-known Type III error (not getting right what is relevant), social systems must know how to identify what the correct thing is in public decisions (effectiveness), so that they can later achieve it (efficacy) in the correct manner (efficiency) (García Lizana and Moreno-Jiménez, 2008).

## **1.6 ECONOMY AND DEMOCRACY**

In recent decades, an important debate has been taking place as to the adequacy of the traditional model of democracy in the context of the knowledge society. One aspect of this has been the study of how democracy and ICT can be integrated and complement each other in the search for a better society.

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<sup>11</sup> Effectiveness is understood here as doing what is right. This requires both the adequate identification of the relevant aspects of the problem to be solved and the setting of the appropriate targets for solving the problem. In our case, this supposes the full development of the capacity to work with a plural and coherent teleological hierarchical system, as the basis of political action (García Lizana and Martín Reyes, 1990). This implies: a) the setting of the highest level goals (subsistence, equity, liberty knowledge, participation...), for the attainment of which the democratic system was ultimately designed; b) the identification of the relevant operative objectives associated with the previous goals; and c) the setting of the precise levels (goals) of the relevant objectives that must be achieved (cited in García Lizana and Moreno-Jiménez, 2008).

The emergence and development of ICT at the end of the XX century has had consequences in all spheres of life, opening new possibilities, challenges and uncertainties for democracy. According to Steven Clift: *“The reality is that our many - and quite different- democracies are changing because of the use of information technology and networks (...). We are experiencing a convergence of democratic institutions and processes with the Internet. Democracy is online (Clift, 2000)”*

ICT are influencing the process of the restructuration of European political systems. Their elements of communication and interaction allow the development of processes to improve the workings of the present democratic system and, even, the emergence of new models of democracy (Harto, 2006).

The Internet in general, and ICT in particular, can facilitate and amplify the process by which citizens become engaged in democracy, both from the technical point of view and from that of the paradigm shift implied by the evolution toward the information and knowledge society. In this sense, they form an interactive and multidirectional communication channel between those represented and their representatives that extends the capacity of information and communication in both directions, increasing transparency and the possible citizen control of the Government. Easy citizen access to political information and interactivity in the relations between citizens and their representatives makes a closer and more personalized communication possible which, in turn, allows a more direct and collective participation in the political system (Colombo, 2006).

The European Commission, at the end of 2001<sup>12</sup>, published a communiqué to the European Council and the European Parliament which analyzed the impact of the electronic economy on European businesses in the light of recent advances in the market. The study, among other measures, proposed fomenting the adoption of ICT, highlighting the necessity of guaranteeing that Public Administrations should not only employ them efficiently, but also become catalysers in spreading their use.

Nevertheless, in spite of the potential of the Internet, inequalities in ICT access show that it is still not possible to use them for a more participative democracy because

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<sup>12</sup> [http://europa.eu.int/comm/enterprise/ict/policy/doc/com\\_2001\\_711\\_es.pdf](http://europa.eu.int/comm/enterprise/ict/policy/doc/com_2001_711_es.pdf) (seen on 10 May 2013)

part of the population is excluded or has access of doubtful quality, a situation that is incompatible with democratic principles. Therefore, with the goal of advancing towards the knowledge society, it is necessary to amplify the communications infrastructure, to promote information technologies, to strengthen information security systems, to ensure equal ICT access and, above all, to foment citizen interest in participating in the creation of a better society through the use of tools that help to improve political management as well as opening new avenues for participation.

It comes as little surprise that some have begun to speak of a certain *fallacy of democracy*, given that this form of representation is not responding to its original purpose, namely, the participation of citizens in their own government for the common good (Moreno-Jiménez et al., 2007). Many voices have been raised, beginning with public administrations (EU Sixth Framework Programme) demanding a greater *implication* of citizens in the government of society.

Thus, and in accordance with the “systemic character of the world in which we live” (Pérez Ríos, 2001), it is necessary to study reality from an integral perspective (a holistic vision of reality) according to which technology influences the economy, the economy has an impact on values and the latter condition economic activity. Furthermore, politics affects the behaviour of the economy, on which the development of technology depends, and technology, in turn, has an influence on human knowledge, on the relationships between people and the environment, on political activity, etc. All this affects patterns of behaviour and is conducive to the creation of adequate conditions for philosophical, methodological and technological changes to occur and, above all, to be applied (García Lizana and Moreno-Jiménez, 2008).

In sum, what is postulated (as was mentioned in the previous section) is to achieve a new type of public management that, as well as guaranteeing the efficacy (satisfying citizens’ goals) and the efficiency (improving costs) of the democratic system through the adequate use of ICT, focuses the models of democratic intervention on their effectiveness (García Lizana and Moreno-Jiménez, 2008).

## **1.7 E-GOVERNMENT**

In this section, with the objective of providing a clear vision of the present situation, the literature to date on e-Government is studied. Firstly, the different concepts that have been used by diverse authors to define everything referring to e-Government are analyzed. Secondly, the possible dimensions that e-Government may adopt are studied. Finally, the perspectives and levels of development of e-Government are analyzed.

### **1.7.1 Delimitation of concepts**

E-Government has become an expression that embodies a multitude of activities and innovation and modernization attempts in the field of public management (Wimmer, 2002).

There is still no commonly accepted definition of the term e-Government. The term has been addressed from different areas, including political, sociological and economical sciences.

In the reports of the National Performance Review, Al Gore (1993a, 1993b) is one of the first authors to use the term e-Government referring to the use of ICT in U.S. Public Administrations as an infrastructure essential for the Administration of the XXI century that allows citizens a generalized and more opportune access to governmental information and public services through processes that are efficient and receptive to the needs of the clients (Al Gore, 1993b).

According to Moon (2002), e-Government fundamentally contains four aspects: i) it includes a secure intranet and central database to achieve a more efficient and cooperative interaction between governmental entities; ii) electronic service delivery; iii) application of e-commerce to promote more efficient transactions on the part of public institutions; and, lastly, iv) digital democracy to favour more transparent accountability.

Some authors define e-Government exclusively by the use of ICT, especially of the Internet, as a means of providing more efficient and effective public services, while others consider that e-Government represents initiatives of greater scope that allow the transformation of the Administration and the processes of governance. Three types of

definition of the concept of e-Government can be distinguished: the first refers to a limited perspective of the term while the other two correspond to a broader vision. Below, the authors that defend each of these perspectives are cited (Royo, 2008).

West, 2000, 2004; Kaylor et al., 2001; National Audit Office, 2002b; Norris et al., 2001; UN/ASPA, 2002; Marche and McNiven, 2003; Reddick, 2004; and Carter and Belanger, 2005, base their theories exclusively on the use of new technologies for the automatization of processes (both internal and in service delivery).

OECD (2001a); Tambouris et al., 2001; Center of Democracy and Technology and infoDev, 2003; European Commission, 2003a; OECD, 2003; Bekkers and Homburg, 2005, base their theories on the use of new technologies to transform the way in which the Administration operates and on service delivery models.

In the two groups above, democratic functions and citizen participation in the decision-making processes and in the elaboration of public policies are not included (Royo, 2008).

Lastly, Gartner Group, 2000; Moon, 2002; European Commission, 2003b; Gil-García and Pardo, 2005; Roy, 2005; and West, 2005a, are authors who defend that new technologies enable the creation of new means of citizen participation in public affairs.

Table 1.1 summarizes the definitions of each of the authors cited above.

**Table 1.1.** Delimitation of the concepts of e-government

Author	Restricted Definition
WEST (2000, 2004)	<i>E-government refers to the delivery of government information and services online through the Internet or other digital means.</i>
KAYLOR et al. (2001)	E-Government is taken to be the ability of citizens to communicate or interact with the local administration through the Internet in any way more sophisticated than a simple email message to a generic address (or to the webmaster) provided on the webpage.

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NATIONAL AUDIT OFFICE (2002b)	E-Government means providing public Internet access to all the services offered by the Administration and allowing the carrying out of electronic transactions for all these services.
NORRIS et al. (2001)	Understand it as the electronic dissemination of governmental information and delivery of public services 24/7.
UN/ASPA (2002)	<i>Utilizing the internet and the world-wide-web for delivering government information and services to citizens.</i>
MARCHE AND McNIVEN (2003)	The supply of routine information and transactions through electronic means, particularly those that use the Internet.
REDDICK (2004a)	The use of the Internet to deliver services and supply information to citizens and businesses.
CARTER AND BELANGER (2005)	The use of ICT to enable and improve the efficiency of the government services that are provided to citizens, employees, agencies and businesses.
<b>Author</b>	<b>Broader Definition - Transformation of the way the Administration operates and of service delivery models.</b>
OECD (2001a)	The term e-Government focuses on the use of ICT by the government, in particular, on the potential of network communication provided by the Internet and related technologies that offers the capacity of transforming the structure and operation of the government.
TAMBOURIS et al. (2001)	Application of ICT in the Administration with the aim of transforming the efficiency, efficacy, transparency and accountability of interchanges within the Administration and between administrations and governmental dependencies at different levels.

CENTER FOR DEMOCRACY AND TECHNOLOGY AND INFODEV (2003)	Use of ICT to transform the Administration, making it more effective, accessible and responsible.
EUROPEAN COMMISSION (2003a)	Use of new technologies to transform the public administrations and to improve how they work with their customers, whether they be citizens, firms or other administrations.
OECD (2003)	Use of ICT, especially the Internet, as a tool to achieve a better government.
BECKKERS AND HOMBURG (2005)	Use of ICT, especially the Internet, by a public entity to foment its current and potential relations with social agents interested in its activity, with the aim of creating added value.
<b>Author</b>	<b>Broader definition -Transformation of models of democracy</b>
GARTNER GROUP (2000)	<i>The continuous optimisation of Government service delivery, citizen participation and governance by transforming internal and external relationships through technology, the Internet and new media.</i>
MOON (2002)	E-Government includes, principally, four aspects: <ul style="list-style-type: none"> <li>i) the establishment of a secure governmental intranet and a central database</li> <li>ii) electronic public service delivery</li> <li>iii) application of e-commerce to promote more efficient transactions on the part of public institutions</li> <li>iv) Digital democracy to favour more transparent accountability on the part of the Administration</li> </ul>

EUROPEAN COMMISSION (2003b)	Use of ICT, together with organizational change and new skills adopted by the public administrations, to improve the democratic processes and public services and to strengthen support for public policies.
GIL-GARCÍA AND PARDO (2005)	Intensive use of ICT in the Administration for the delivery of public services, improving management efficacy and fomenting democratic mechanisms and values.
WEST (2005a)	Use of the Internet and other digital media by the public sector in the delivery of services, information and democracy itself.

**Source:** Own elaboration based on Royo (2008)

In the first of the groups that define the concept of e-Government appear the meanings in which it is defined as the delivery of services through the Internet. In the second group, it is defined as a tool capable of transforming the Public Administration through the use of ITC. Lastly, the third group includes citizen participation in public affairs and, therefore, is more related to questions of democracy.

We consider that the e-Government of society should not be restricted to offering a series of electronic services of information to citizens (e-Administration). Neither should it be limited to the electronic delegation of representation (e-Voting) or to the expression of opinions by social actors (citizens, political parties, representatives,...) in a process of electronic debate (e-Discussion), nor even to a combination of the two in a process of electronic participation (e-Democracy), (Moreno-Jiménez, 2006).

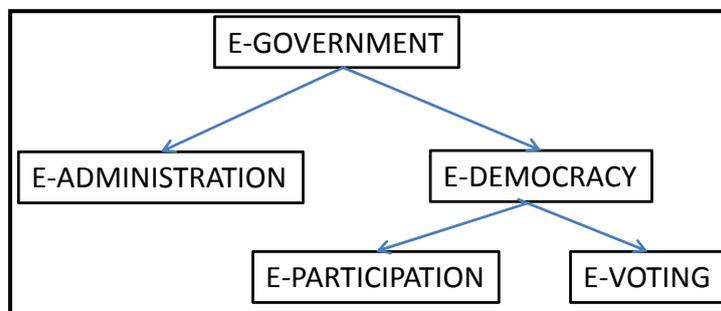
E-Government, understood as “a set of activities organized by public institutions, and sometimes by individuals and groups, to offer services to the citizenry employing ITC as a support” (Moreno-Jiménez, 2006), should pursue objectives of greater transcendence for the human species and, in general, for the world in which it is immersed (holistic vision of reality). These ends should be linked to the essence of the evolutionism of living species, that is, to the creation and diffusion of knowledge to

society (Moreno-Jiménez, 2003b), knowledge that would be associated with the scientific resolution of the problems raised by the government of society.

### 1.7.2 Dimensions of e-Government

The literature on e-Government identifies two dimensions (see Figure 1.1.) in which the Internet plays a fundamental role in the reform processes of the Administration: economic or service delivery (e-Administration) and civic or democratic participation (e-Democracy) (Bertelsmann Foundation, 2002; Chadwick and May, 2003). E-Democracy, in turn, is classified into e-Participation and e-Voting. E-Democracy is *the use of information and communications technologies and strategies by 'democratic sectors' within the political processes of local communities, states/regions, nations and on the global stage (Clift, 2003)* (this concept is developed in greater detail in the following chapter of this thesis). Macintosh (2004) defined e-Participation as *“the use of ICTs to broaden and deepen the political participation of citizens, so they can connect with each other and with their elected representatives* (this term will be studied in greater depth in Chapter 3 of this thesis).

**Figure 1.1.** E-Government contexts at the beginning of the 2000s.



With respect to the spheres contemplated in the context of e-Government, Hiller and Bélanger (2001) distinguish five levels. In the first, the most basic level of e-Government, ICT are used to disseminate information in one direction, simply uploading it onto the corresponding webpage. Level 2 is characterized by a two-way communication carried out interactively between the government and the citizens. In level 3, the government allows the delivery of online services and digital economic transactions. In level 4, the government tries to integrate various governmental services vertically (inter-governmental integration) and horizontally (intra-governmental

integration) to improve efficiency, ease of use and effectiveness. This level is a complex task for governments for which they have to dedicate a great deal of time and resources in order to integrate digital systems (online) and personnel systems (back-office). The vertical and horizontal integrations distribute data and information between the different functional units and levels of government to achieve better online public services. Finally, level 5 contains the promotion of citizen participation in political decisions through the use of the Web. This level includes voting, discussion forums, online surveys and interaction with citizens (Web 2.0<sup>13</sup>).

E-Administration would include the first four levels of the classification established by Hiller and Bélanger (2001)<sup>14</sup>: *one-way information, two-way information, online services and transactions, and governmental integration*.

Although there is no consensus on the definition of e-Government and its scope of action, there is agreement as to the continuous evolution of its concept.

Layne and Lee (2001) propose a four-stage evolution: (1) cataloguing; (2) transaction; (3) vertical integration and (4) horizontal integration.

The UN report on e-Government in the KS proposes a five-stage evolution: (1) emerging presence; (2) improved presence; (3) interactive presence; (4) transactional presence and (5) online presence.

Dabholkar et al., (2005) suggest the consideration of e-Government from four perspectives: (1) citizens and clients; (2) process (reorganization); (3) (tele) cooperation and (4) knowledge.

Capgemini (2007), in collaboration with the European Commission, propose the following five stages: (1) information; (2) one-way interaction; (3) two-way interaction; (4) transactions and (5) personalization.

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<sup>13</sup> Ribes (2007) define la Web 2.0 como “*todas aquellas utilidades y servicios de Internet que se sustentan en una base de datos, que puede ser modificada por los usuarios del servicio, ya sea en su contenido (añadiendo, cambiando o borrando información o asociando datos a la información existente), bien en la forma de presentarlos o en contenido y forma simultáneamente*”.

<sup>14</sup> Other authors, such as Moon (2002), introduce a fifth level called *political participation*. This phase implies the use of the Internet to promote greater citizen participation and implication in public affairs.

Parisopoulos et al. (2009), reviewing the relevant literature, suggest that the transformation of the Government to improve its efficiency through the use of ITC (t-Gov)<sup>15</sup>, depends on nine factors: user-oriented services; unified, one-click governments; multi-channel service offer; flexibility; efficiency; increase in human skills; organizational change, change of attitude of civil servants and, finally, the value of innovation.

Moreno-Jiménez (2009) suggests, in the context of the KS, three perspectives (P3) in the evolution of e-Government: (i) Oriented towards Content (Products); (ii) Oriented towards Services for the Citizen (Process) and (iii) Oriented towards the Actors – politicians, employees, citizens, interest groups...– (Persons) and two fields of application for e-Government: e-Administration and e-Participation or e-Governance (see Figure 1.2.)

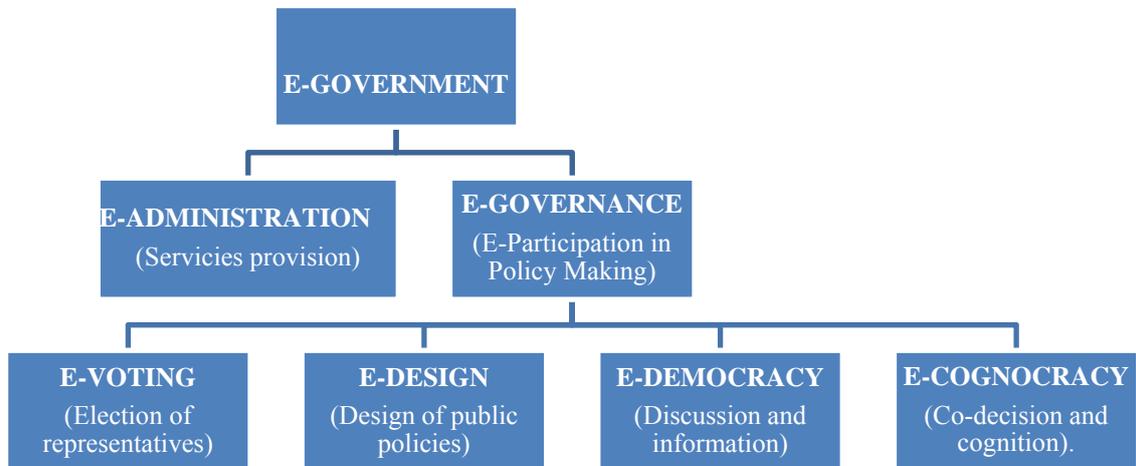
The first (*e-Administration*) would include the services provided by the Administration to better attend to its clients (citizens, firms, interest groups...). This field would include the first four levels of the classification established by Hiller and Bélanger (2001): *one-way information, two-way information, online services and transactions, and governmental integration*.

The second field (*e-Participation in policy making –sometimes called e-Governance-*) includes the services that require the participation of the citizens and interest groups to jointly construct a better society. This field includes (Moreno-Jiménez 2009): *e-Voting* (election of representatives or incorporation of individual preferences); *e-Design* (design of public policies); *e-Democracy* (discussion and information), and *e-Cognocracy* (creation of a better society through co-decision and cognition or formation).

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<sup>15</sup> Murphy (2005) states that t-Gov refers fundamentally to the radical change in the way the government does what it does, especially to the change in the behaviour and culture of the government.

**Figure 1.2.** Dimensions of e-Government according to Moreno-Jiménez (2009)



**Source:** own elaboration

In what follows, we associate the denomination de e-Governance with the e-Participation in public decision-making relative to the government of society. In this context, *e-Voting* is understood as the use of ITC (the Internet and any web-enabled communication media) for both the election of political representatives and for the incorporation of the opinions of actors participating (discussion) in the decision-making and of the preferences of those involved in the decision (co-decision).

*E-Design* is understood as the application of ITC, by citizens and their representatives, at all stages covered by the design of public polices (see Chapter 2, section 2.6.6.2).

As for e-Democracy, in the context of the knowledge society, it is understood (Moreno-Jiménez, 2006) as the *system of government that allows, using ITC, participation in the decision-making process of all the actors (citizens, rulers, representatives, political parties, social organizations, international organisms,...) involved in the resolution of the problem, through discussion of the problem and the delegation of representation in decisions.*

Finally, e-Cognocracy is understood as the use of ITC in public decisions taken jointly by the elected representatives and the citizens. In this case, instead of the information and discussion that are characteristics of e-Democracy, the objective is

education (cognition) and decision. As regards education, this refers to the creation and diffusion (democratization) of the knowledge extracted from the scientific resolution of the problem.

While e-Democracy, at least in its original meaning, refers (Moreno-Jiménez et al., 2008) to the participation via the internet (e-Participation) of citizens in public decision-making, where this participation, in practice, consists of citizens simply offering their comments, opinions and suggestions to the elected representatives (debate and discussion), e-Cognocracy, since it was first proposed in 2003, has permitted: (i) incorporating opinions into the discussion; (ii) incorporating preferences into the co-decision between representatives (politicians) and those they represent (citizens) and (iii) combining opinions and preferences in e-Cognition, as a way to improve society.

### **1.7.3 Perspectives of e-Government**

With aim of facilitating the understanding and the implementation of e-Government, academics and professionals like Yong, Heeks, Lenk and Traunmuller, and Wimmer have developed frameworks that describe and schematize this concept. Many of these frameworks present a simplified vision of the relationships between the participating groups. One generally accepted strategic framework focuses on the dynamics between the different groups of users of the public administration. These groups are the “government”, the “citizens” and the “firms”. To move these three critical groups towards a vision of e-Government, the government is continuously involved in bidirectional interactions with the other two groups: relations of the public institutions with citizens (G2C-Government to Citizen), with firms (G2B-Government to Business) and with other public entities (G2G-Government to Government).

The G2G relations represent the internal systems and procedures that compose the structure of the public organizations. At the same time, they imply electronic transactions and include interactions between employees, departments, agencies, ministries and even other governments.

The G2B initiatives have received a great deal of attention due to the dynamic nature of commercial activities and to their potential for reducing transaction costs. Online governmental transactions provide and facilitate opportunities for firms to simplify electronic processes and operations that avoid physical presence in an office.

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The G2C initiatives have been designed to facilitate the interaction of citizens with the government. They focus on the client and on the electronic services that are provided through the concept of the “one-stop shop”. This means that the citizens can carry out several different operations, especially those that involve multiple agencies, without having to contact each of them. According to Yong (2003), having just one point of access facilitates citizen participation in democratic processes.

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# CHAPTER 2

## MODELS OF DEMOCRACY

### 2.1 INTRODUCTION

Many voices, beginning with public administrations (VI EU Framework Programme), have begun to call for greater citizen *implication*.

Western societies have mainly opted for the so-called democratic system. However, in recent years, there has been talk of a certain *fallacy of democracy*, given that this form of representation is not responding to its initial proposition, namely, the participation of citizens in their own government, and neither has it managed to adapt to the new times, especially to the phenomena of globalization and technological change. These aspects have favored the appearance of a new system of human relations (virtual and global community) that use the Web and the Internet as a communications support (Moreno-Jiménez, 2006).

According to a study elaborated by Marshall and Jagers (2000), since the end of the 70s, the number of democratic countries has gradually grown, abandoning, little by little, authoritarian systems. This increase is linked to processes of political liberalization and to efforts to extend participation.

Iris Marion Young (2000) claims that not all individuals are equally motivated to participate in politics. Democracy is only one aspect of lives as social persons. Nevertheless, as a political system, it is a method that allows us to socially enjoy our

interests without have to resort to the use of force or coercion. Young also affirms that the democratic process is the best way of changing conditions of injustice and of promoting justice. Therein lies the importance of citizen participation not being limited to voting.

There is an ongoing debate about how to establish the relationship between the proliferation of ICT and the improvement of democracies. For many, the new technologies will, without doubt, resolve the problems that classical democracies present. Other, however, play down and relativize their real impact and are more skeptical (Subirats, 2002).

In any case, studies on the improvement of the quality of democracy have recently included ICT as a highly relevant factor. Steven Clift already pointed out that ICT can help to improve and deepen democracy in many ways (Clift, 2004).

This chapter analyzes the concept of democracy, based on the models of traditional democracy presented by David Held. Furthermore, it studies how the emergence of ICT in politics has meant the introduction of fundamental changes into democratic political systems, which, in turn, has led to the opening of new possibilities and challenges for democracy with the appearance of new models of electronic democracy. Finally, the concept of *e-Cognocracy* is explained, a new model of cognitive democracy proposed by José M<sup>a</sup> Moreno (Moreno-Jiménez 2003, 2004, 2006; Moreno-Jiménez and Polasek, 2003, 2004, 2005).

## **2.2 DEMOCRACY. CONCEPT AND TRADITIONAL MODELS**

Democracy derives from *demokratia*, whose etymological roots are *demos* (people) and *kratos* (government). Democracy means “*a form of government in which, contrary to monarchies and aristocracies, the people govern. Democracy entails a state in which some form of political equality prevails among the people*” (Held, 1992).

The most quoted and succinct definition of democracy is probably that found in Abraham Lincoln’s Gettysburg Address where he defines it as the “government of the people, by the people, for the people”.

Democracy has always been based on fundamental values or principles such as equality, liberty, moral self-development, the common interest, private interests, social utility, the satisfaction of needs and effective decisions (Held, 1992).

The history of democracy is somewhat imprecise, mainly because it is a history that is still active and because the questions it encompasses are considered to be quite complex (Williams, 1976). This complexity is evident, for example, in the fact that we can still find debates in which it is questioned whether democracy means some kind of popular power (a form of life in which citizens participate in self-government and self-regulation) or a contribution to decision-making (a way of legitimating the decisions of those elected by vote from time to time –the representatives– to exercise power). The history of democracy proposed by David Held (Held, 1992) is, among other things, “*the history of fundamental alterations in the nature of political community and of some of the key political possibilities that we face, now and in the future*”.

Democracy as a “good” form of government was resuscitated at the beginning of the XVIII century, Rousseau being one of its great proponents, but even he did not hesitate to raise a series of objections against the general will, precisely because reason commits errors, even more so if it is subject to a large number of people.

For the analysis of democracy, it is convenient to have, at least, a common horizon. Following the arguments of Robert Dahl (1999), five criteria are contemplated for the study of democracy:

- i) *Effective participation*<sup>16</sup>: all citizens must have equal opportunities.
- ii) *Voting equality*: those represented must have solid guarantees that their decisions expressed in the vote will be counted and considered effectively.
- iii) *Enlightened understanding*: states that all citizens must have equal and ample opportunities for discovering and affirming their preferences in the questions to be decided.
- iv) *Control of the agenda*: popular capacity to decide on what matters should be included on the agenda about what must be deliberated.

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<sup>16</sup> The concept of *effective* is understood in this context as real.

- v) *Inclusion*: the adult members of the community who are recognized as legitimate citizens, avoiding any criterion that is or seems discriminatory.

In this political system, through universal suffrage, the people have the right to periodically elect and control their rulers. Unfortunately, at least in the Spanish case, their intervention in the government of society is limited, almost exclusively, to the delegation of representation to a political party. This delegation is performed at each election and is controlled in the following ones through voting for new representatives.

At no moment, except on rare occasions (referendums), do individuals intervene directly and personally in their own government (Moreno-Jiménez, 2005).

Recently, many warnings have been heard about the lack of citizen interest in this political regime, the limitations it presents (Moreno-Jiménez, 2003a, 2004, 2005; Moreno-Jiménez and Polasek, 2003) and the serious risks that may arise if citizens do not consider themselves adequately represented.

More and more, the interest and efforts of administrations to foment the implementation and use of ICT in questions of e-Government can be observed. For example, municipal websites have become an important source of information for citizens (Valls, 2004).

The emergence of ICT in politics has introduced fundamental changes in democratic political systems, which, in turn, have permitted a certain degree of interaction between political representatives and citizens. Taking advantage of the development of ICT, a profound reflection on the orientation that democracy should take in the future and on the possibilities offered by the Web (Internet, mobiles,...) is necessary. The application of the latter has meant the opening of new possibilities and challenges for democracy (see Section 2.3).

As this section is titled “Democracy. Concept and traditional models” it can be considered relevant to explain the meaning of the concept of *models*. David Held (Held 1992) used this term to refer to a theoretical construction designed to reveal and explain the key elements of a democratic form. His theory is based on the fact that an aspect of public life or a set of institutions can only be adequately understood in terms of its relations with other social phenomena. Models are, consequently, *complex networks of concepts and generalizations about political, economic and social aspects*. Held adds

that models of democracy also imply a changing equilibrium between descriptive-explanatory and normative statements; that is, between statements about how things are and why they are like that and statements about how things must or should be.

David Held (Held, 1992) distinguishes between two types of democratic models: i) classic models and contemporary models. The author considers four examples of classic models: a) Athenian democracy; b) Republicanism; c) Liberal democracy and d) Direct democracy. There are also four contemporary models: a) Competitive elitist democracy; b) Pluralism; c) Legal democracy and d) Participatory democracy. Other authors such as Habermas, Dryzek, Rawls, Fishkin etc., consider a fifth model called Deliberative democracy. Moreover there is the model called Cognitive democracy, studied by authors such as Morin and Moreno-Jiménez, among others.

### **2.2.1 Classic models**

#### **2.2.1.1 Athenian democracy**

The principle of justification on which this type of democracy is based is that *“Citizens must enjoy political equality in order to be free to rule and be ruled in turn”* (Held 1992).

The fundamental characteristics that this model possesses are:

- Direct participation of the citizens in the legislative and judicial functions
- The assembly of citizens exercises the sovereign power
- The sphere of action of the sovereign power includes all the common affairs of the city
- There are many methods for selecting those standing for public office (direct election, drawing lots, rotations).
- There are no distinctions of privilege between ordinary citizens and those in public office.
- With the exception of posts related to the army, the same post can not be occupied twice by the same individual
- Short mandates for all posts

- Public services are remunerated

The general conditions that this type of democracy presents are: that it is a small city-state; housework, that is, the work of the women, frees men for their public duties; and the restriction of the citizenry to a relatively small number (Held 1992).

#### **2.2.1.2 Republicanism**

Within this model, we find two types: i) Protective Republicanism and ii) Developmental Republicanism.

##### **2.2.1.2.1 Protective Republicanism**

The principle of justification on which Protective Republicanism is based is that *“Political Participation is an essential condition of personal liberty; if citizens do not rule themselves, they will be dominated by others”* (Held, 1992).

The main characteristics that this democratic model possesses are the following:

- Balance of power between the “people”, the aristocracy and the monarchy, linked to a mixed constitution or a mixed government, with the condition that all the main political forces play an active role in public life.
- Citizen participation achieved through different possible mechanisms, including the election of consuls or representatives integrated into government councils.
- Competitive social groups that promote and defend their interests.
- Freedom of expression and association
- Rule of law

The general conditions that this model establishes are: that it is a small urban community as well as being a society of independent craftsmen and merchants; the maintenance of a religious cult; exclusion of women; agricultural workers; and that there is an intense conflict between rival political associations (Held, 1992).

##### **2.2.1.2.2 Developmental Republicanism**

The principle on which this type of model is based is that *“All citizens should enjoy political and economic equality in order that nobody can be a master of another*

*and thereby enjoy equal freedom and independence in the process of collective development” (Held 1992)*

The fundamental characteristics that Developmental Republicanism presents are the following:

- Separation of the legislative and executive functions
- The legislative power is constituted by the direct participation of the citizens in public meetings
- Unanimity in public issues is considered desirable but, if there is disagreement, majority rule in voting is accepted
- Executive posts are in the hands of magistrates or administrators.
- The executive is named either by direct election or by drawing lots.

The general conditions that this model presents are: the communities must be small and not industrial; the citizenry depends on the ownership of property, that is, a society of independent producers; and the housework of the women leaves the men free time for work (not housework) and politics.

### **2.2.1.3 Liberal democracy**

Within this model, we find two types: i) Protective Democracy and ii) Developmental democracy.

#### **2.2.1.3.1 Protective Democracy**

The principle on which this type of democracy is based is that *“Citizens require protection from the governors, as well from each other, to assure that those who govern pursue policies that are commensurate with citizens’ interests as a whole” (Held, 1992).*

The fundamental characteristics of this model are:

- Sovereignty is vested, ultimately, in the people, but it is conferred on the representatives who legitimately exercise the functions of the state.

- Regular elections, the secret ballot, competition between factions, potential leaders or parties and majority rule are the institutional bases to establish the responsibility of those who govern.
- The powers of the state must be impersonal, be legally circumscribed and divided into executive, legislative and judicial.
- Centrality of constitutionalism, to guarantee freedom from arbitrary treatment and equality before the law, in the form of political and civil rights, or liberties, especially those related to freedom of speech, expression, association, vote and belief.
- Separation of the state from civil society

The general conditions that this type of democracy establishes are, basically, the development of a politically autonomous civil society; competitive market economy; private ownership of the means of production and patriarchal families.

#### **2.2.1.3.2 Developmental democracy**

The basic principle that sustains this democratic model is that *“participation in political life is necessary not only for the protection of individual interests but also for the creation of an informed, committed and developing citizenry. Political involvement is essential to the highest and harmonious expansion of individual capacities.”* (Held, 1992).

The fundamental characteristics that this type of democracy possesses are:

- Popular sovereignty with universal suffrage (together with a proportional system in the distribution of votes)
- Representative government (elected leadership, periodic elections, secret ballot, etc.)
- Constitutional checks to ensure the limitations and the division of the power of the state, as well as the promotion of individuals' rights, especially those related to freedom of thought, feeling, discussion and publication.
- Separation between the functions of those elected and the functions of specialist administrators (experts).

- Participation of citizens in the various branches of government, through their vote.

The general conditions presented by this type of democracy are: a competitive market economy; an independent civil society with the minimum interference from the state; political emancipation of women, but preserving the traditional division of housework; a system of nation-states with international relations; and private ownership and control of the means of production.

#### **2.2.1.4 Direct democracy**

The principle of justification on which this model of democracy is based is that *“the ‘free development of all’ can only be achieved with the ‘free development of each’.* *Freedom requires the end of exploitation and ultimately complete political and economic equality; only equality can secure the conditions for the realization of the potentiality of all human beings so that ‘each can give’ according to his or her ability and ‘receive what they need’”* (Held, 1992).

The fundamental characteristics of this type of democracy are:

- Public affairs to be regulated by Commune(s) or council(s) organized in a pyramidal structure.
- Government personnel, magistrates and administrators are subject to frequent elections, to the mandate of their community and may be revoked.
- Civil servants will not receive a higher salary than workers
- Popular militias maintain the new public order subject to the control of the community.
- The government and politics in all its forms permit self-regulation
- All public questions to be resolved collectively
- Consensus is the principle of decision in all public questions
- Distribution of the rest of administrative tasks by rotation and election
- Substitution of all armed and coercive forces by self-control

The general conditions that this type of democracy presents are: the unity of the working class; defeat of the bourgeoisie; end of class privileges; progressive integration of the state and society; all vestiges of classes disappear; disappearance of scarcity and the abolition of private ownership; elimination of the markets, of interchange and of money; and the end of the social division of work (Held, 1992).

### **2.2.2 Contemporary models**

Held establishes four types of contemporary models: Competitive elitist democracy, Pluralism, Legal democracy and Participatory democracy. Other authors (Habermas, Elster, Cohen, Rawls, Moreno-Jiménez...) also consider Deliberative democracy and Cognitive democracy. Below, they are explained in detail.

#### **2.2.2.1 Competitive elitist democracy**

The basic principle that justifies this type of democracy is “the method for the selection of a skilled and imaginative political elite capable of making necessary legislative and administrative decisions.” (Held, 1992)

The fundamental characteristics of this model are the following:

- Parliamentary government with a strong executive
- Competition between the elites and rival political parties
- Dominion of parliament by political parties
- Central character of political leadership
- Bureaucracy: an independent and well-trained administration

The general conditions of Competitive elitist democracy are: Industrial society; model of social conflict; poorly-informed and/or emotional electorate; a political culture that tolerates differences of opinion; emergence of strata of experts and technically qualified managers; and competition between states for power and advantages in the international system.

#### **2.2.2.2 Pluralism**

The principle that justifies classic pluralism is that it guarantees the government of minorities and, hence, political freedom (Held, 1992)

The fundamental characteristics of this democratic model are the following:

- Citizen rights, including one person-one vote, freedom of expression, freedom of organization
- A system of restraints and counterbalances between the legislature, the executive, the judicial power and the bureaucratic administration
- Competitive electoral system with (at least) two parties
- Diverse range of (overlapping) interest groups that seek political influence
- The government mediates and judges between different claims
- The constitutional norms are immersed in a political culture that backs them up

The general conditions presented by this type of democracy are: power is shared and interchanged between numerous groups of the society; broad base of resources of different types spread amongst the population; sufficient equilibrium between active and passive citizens to guarantee political stability and consensus with respect to the political procedures; a range of alternatives; and the legitimate scope of politics.

### **2.2.2.3 Legal democracy**

The principle that justifies the model of Legal democracy is that *“the majority principle is an effective and desirable way of protecting individuals from arbitrary government and of maintaining liberty. However, for political life, like economic life, to be a matter of individual freedom and initiative, majority rule must be circumscribed by the rule of law. Only under these conditions can the majority principle function wisely and effectively”* (Held, 1992).

The fundamental characteristics of Legal democracy are:

- A constitutional state (modeled by features of the Anglo-Saxon political tradition, which includes a clear division of powers)
- Rule of law
- Minimum intervention of the state in civil society and in private life
- A free market society as broad as possible

The general conditions that this type of democracy presents are: an effective political leadership, guided by liberal principles; reduction to the minimum of excessive bureaucratic regulation; restriction of the role of interest groups (trade unions...); and reduction to the minimum (eradication, if possible) of the threat of any type of collectivism (Held 1992).

#### **2.2.2.4 Participatory democracy**

The principle that justifies this model of democracy is “*an equal right to liberty and self-development can only be achieved in a ‘participatory society’, a society which fosters a sense of political efficacy, nurtures a concern for collective problems and contributes to the formation of a knowledgeable citizenry capable of taking a sustained interest in the governing process*” (Held, 1992).

The fundamental characteristics of Participatory democracy are:

- Direct citizen participation in the regulation of the key institutions of society, including the workplace and the local community
- Reorganization of the system of parties, making the party officials directly responsible to their members
- Functioning of the participatory parties in the parliamentary structure or the congress
- Maintenance of an open institutional system that guarantees the possibility of experimenting with political forms

The general conditions that this model presents are: direct improvement of the scarce resource base of many social groups, through the redistribution of material resources; reduction, in public and private life, of bureaucratic power that is not accountable to citizens; an open information system that guarantees informed decisions; reconsideration of housework, so that both women and men, can take advantage of the opportunity to participate (Held, 1992).

#### **2.2.2.5 Deliberative democracy**

The concept of deliberative democracy was first presented in 1980 by Joseph M. Bessette, who later, in 1994, re-elaborated it. Since then, numerous philosophers and

political scientists have contributed to developing the deliberative notion of democracy; among them, Jürgen Habermas, Jon Elster, Joshua Cohen, John A. Dryzek, John Rawls, Amy Gutmann, James Fishkin, Dennis Thompson and Seyla Benhabib can be highlighted.

Habermas is one of the main instigators of this political model. This author studies democracy from the social and empirical point of view and within the scope of his theory of communicative action. He conceives deliberative democracy as an extension of communicative action. (Habermas, 1982).

The term deliberative democracy "*designates a normative model– a regulatory ideal– that seeks to complement the typical notion of representative democracy through the adoption of a collective procedure of political decision-making that includes the active participation of all those potentially affected by these decisions and that would be based on the principle of deliberation, which implies the public argumentation and discussion of the different proposals*" (Velasco, 2009).

#### **2.2.2.6 Cognitive democracy**

Morin (1997) proposes paving the way towards "*a cognitive democracy that permits the formation of a citizenry to build a political culture capable of thinking for itself and of opting for the solidarity, the responsibility and the sense of belonging of all citizens to the planet Earth and, thus, to “transform the human species into genuine humanity”*".

The diagnostic formulated by Morín (1997) is the existence of a democratic deficit in the production and reproduction of knowledge, which stimulates the development of "*a knowledge that is not produced to be articulated and thought, but rather to be capitalized on and used anonymously*".

Along different lines to this sociological vision of cognitive democracy, José M<sup>a</sup> Moreno-Jiménez (2003), based on the context of the evolutionism of living beings, independently proposed a model of cognitive democracy in the knowledge society: e-Cognocracy.

Cognitive democracy requires the scientific resolution of the complex problems that occur in a democratic society, with the support of the citizens to improve the quality of life through the creation of knowledge within a global and multicultural

context. To do so, it makes use of the democratic system as a catalyzing element of learning that guides the cognitive process of living beings (Moreno-Jiménez, 2004).

### **2.3 FROM DEMOCRACY TO E-DEMOCRACY**

In the first chapter, it was already noted that e-Government implies the use of ICT to provide governmental information and services efficiently and effectively through the uninterrupted availability of the Web (West, 2004; Carter and Bélanger, 2005), involving the management of enquiries and participative interactions between the public sector, firms and citizens (Chadwick and May, 2003; Snellen, 2002).

According to Blumler and Coleman (2001), a threefold combination of facts made a more participatory style of democracy desirable: i) a “crisis of democracy” ii) a simultaneous rise of internet penetration and iii) a significant turn in democratic theory towards a more deliberative view of active citizenship.

In recent years, Web 2.0 technologies have offered Public Administrations new ways of interacting with citizens and of knowing their opinion (Moreno-Jiménez et al., 2005; Jiang and Xu, 2009; Hui and Hayllar, 2010). The term Web 2.0 was coined by Tim O’Reilly (2005) to refer to second generation Webs, a technological evolution from Web 1.0. According to Miller (2005), Web 2.0 “is the network as platform, spanning all connected devices; Web 2.0 applications are those that make the most of the intrinsic advantages of that platform: delivering software as a continually-updated service that gets better the more people use it, consuming and remixing data from multiple sources, including individual users, while providing their own data and services in a form that allows remixing by others, creating network effects through an "architecture of participation," and going beyond the page metaphor of Web 1.0 to deliver rich user experiences”

Web 2.0 tools have changed the use of the basic instruments of discussion offered by the previous Web pages (Web 1.0), such as discussion forums and open channels of contact for citizens, to a greater use of applications of rapid response like blogs, microblogs, social networks, etc., that allow a more direct channel of communication

between politicians and citizens (Wattal et al., 2010). These technologies, in turn, permit improvements in the implementation and distribution of services (Jiang, et al., 2009), constructing relations with actors in a way that was not possible with traditional means of communication (Hearn et al., 2009).

The new tools of electronic participation, such as social networks and Web 2.0, are initiatives that aim to improve the level and quality of citizen participation in public policies (Kolsaker and Lee-Kelly, 2008), increasing public trust in the government (Leib and He, 2006; Kim et al., 2005).

The vital process of living systems is a cognitive process. Only the species that learn, adapt and spread knowledge survive. As a result, the new democracy must orient itself towards the search for and the creation and diffusion of knowledge. In this sense, the use of Web 2.0 is a fundamental tool for modeling, discussion and negotiation (Moreno-Jiménez et al., 2005).

Recently, some improvements to Web 2.0 have appeared, giving rise to the so-called Web 3.0. This Web has quite a different focus from what Web 2.0 has come to mean. For instance, while Web 2.0 is managed by the human user her/himself, Web 3.0 is managed through cloud computing and executed from any device, with a high degree of personalization (Pons, 2012). Web 3.0 constitutes a new type of Web in which semantic content is added to the documents that make it up (Enríquez, 2012). Moreover, it lays out the principles for creating a base of knowledge and semantic and qualitative information. In this way, it is able to store the preferences of users, combining them, at the same time, with the contents that exist on social networks and mobile internet. This makes it possible to attend more precisely to requests for information and to facilitate accessibility to digital contents (Hernández and Küster, 2012)

E-Democracy, also called electronic democracy or digital democracy, has arisen in the context of growing public concern about the transparency and accountability of the government and politicians (King, 2006). It can be observed how the new technologies accelerate the capacity of response of Public Administrations, improving democratic governance (King, 2006; Chandwick, 2003), which, in turn, allows citizens to be better informed and, therefore, to make more effective decisions.

The new tools of electronic participation, such as social networks and Web 2.0, tend to focus on the capacity of electronic democracy to foment shared values and common goods that exist in the local sphere, viewing the Internet as a device that facilitates interaction between citizens and politicians (Hui and Hayllar, 2010).

According to Steven Clift (Clift, 2000), the ten aspects that must be carried out in order to talk of e-Democracy are:

1. Announce all public meetings online in a systematic and reliable way.
2. Put a "Democracy Button" on the administration site's top page to take users to a special section detailing the purpose and mission of the entity, the principal laws that affect citizens, etc.
3. Implement "Service Democracy." This facilitates online transactions and surveys, the gathering of citizen opinions, etc.
4. End the "Representative Democracy Online Deficit," that is, invest in communications technology and infrastructure.
5. Enable levels of representation through the Internet, creating "Virtual Committee Rooms" that permit the collection and interchange of citizen opinions.
6. Embrace the two-way nature of the Internet and respond rapidly to e-mails.
7. Hold online consultations to educate citizens to participate more in public policy issues.
8. Develop legislation to regulate e-Democracy.
9. Educate elected officials in the use of the Internet in their day-to-day work.
10. Create applications to ensure a single access point to the Administration, even permitting and facilitating interaction with other administrations worldwide.

Clift (2003) defines e-Democracy as *"the use of information and communications technologies and strategies by 'democratic sectors' within the political processes of local communities, states/regions, nations and on the global stage"*. He also affirms that: *"The reality is that our many and quite different-democracies are changing because of the use of information technology and networks (...). We are experiencing a*

*convergence of democratic institutions and processes with the Internet. Democracy is online”* (Clift, S. 1998).

For José M<sup>a</sup> Moreno, the three basic ideas of what is known as electronic democracy are: (i) to facilitate access to information; (ii) to use the web to vote and (iii) to use discussion forums based on the new ICT (Moreno-Jiménez et al., 2005).

Other authors such as Sakowicz (2003) define e-Democracy as *the use of ICT as an instrument to help set agendas, establish priorities, make important policies and participate in their implementation in a deliberative way*. It refers to activities that increase citizen involvement including virtual town meetings, open meetings, cyber campaigns, feedback polls, public surveys and community forums (Coleman et al., 2002)

Furthermore, it can be highlighted that ICT have influenced and influence the process of restructuration of political systems. Their communicative and interactive elements allow improvements in the functioning of the democratic system and even the creation of new models of democracy. In this sense, their application in democracy has permitted the appearance of a wide range of approaches and models (Hagen, Van Dijk, Bellamy, Horrocks and Tops). The following section explains these approaches in detail.

## **2.4 TYPOLOGIES AND MODELS OF ELECTRONIC DEMOCRACY**

The typology that opens the debate is that formulated by Martin Hagen in the mid-nineties. Its focus is intended to be applied to the North American political system, highlighting the culture of each country's policy in the use of ICT in politics (Hagen 2000).

The criteria employed for the elaboration of this typology are: (i) the technology used is computer networks and cable television; (ii) the preferred type of democracy is the direct or the representative; (iii) the dimensions of political participation are information, discussion, voting and political action; and (iv) the political agenda (progressive, conservative, community, libertarian).

Hagen (1997) distinguishes three types of electronic democracy: a) teledemocracy, b) cyberdemocracy and c) electronic democratization.

- a) Teledemocracy is the pioneer concept of what is understood as electronic democracy. It was born and developed in the seventies and lasted into the eighties. The introduction of cable television in the United States provided the technological support on which teledemocracy was built: it strives to establish mechanisms of direct democracy, using new communication technologies for this end. However, after the initial enthusiasm of the seventies, a generalized skepticism developed as to the possibilities of telecommunications technologies to introduce improvements into the political system. It was necessary to wait until the nineties for teledemocracy to recover the value it had lost in society.

According to the teledemocrats, the concept of electronic democracy is characterized, fundamentally, by the defense of direct democracy and, in terms of political participation, its objectives are the vote and political activism.

- b) Cyberdemocracy appears as a response to the extension of computer networks: the icon of cyberdemocracy is the Internet. It is based on two elemental notions: 1) the search for the true democracy, understood as direct democracy and 2) the search for material welfare, the search for individual happiness understood as the enjoyment of a high purchasing power.

Hagen distinguishes two variants within this second typology. First, a more conservative and libertarian focus that highlights the importance of the free market. Second, a more progressive and community focus that emphasizes the importance of community values.

- c) Electronic democratization improves and perfects representative democracy, underlining the necessity of increasing the channels and flows of information to ensure that citizens have a greater weight in the decision-making process. The defenders of this approach point out that citizen apathy and lack of implication in political participation do not have their roots in the representative system itself but rather in certain imperfections and defects in its workings that can be resolved through the application of ICT to create new forms of communication between those represented and their representatives.

Below, we present the types of electronic democracy proposed by Hagen in a table (Table 2.1.).

**Table 2.1.** Martin Hagen’s types of electronic democracy

Concept	Teledemocracy	Cyberdemocracy	Electronic democratization
<b>Key issues</b>	<p>Computer Mediated Communication (CMC) can bridge space and time and make forms of political participation long considered impractical possible.</p> <p>Traditional forms of representative democracy cannot deal with the complexity of the information age. Local forms of democracy and empowerment of the individual are necessary and, via CMC and other interactive media, possible.</p> <p>Democratic uses of media are necessary as a counterbalance to “abuses” of the media due to commercial objectives.</p>	<p>Creation of both virtual and material communities is central task of 21<sup>st</sup> century. democracy</p> <p>Information becomes prime economic resource, business and individuals can better maximize their own good via CMC.</p> <p>CMC enables decentralized, self-governed forms of government, thus guarding effectively against state abuses of authority (such as censorship, invasion of privacy, etc.)</p>	<p>CMC-based political information systems allow more and freer access to crucial government information.</p> <p>Electronic Town Meetings can create much needed links between public and representatives to deliberate political issues and create a new sense of community among the electorate</p> <p>Because interest groups etc. can lower transaction and organization costs, civil society is strengthened via.</p>
<b>Most central forms of political participation</b>	<p>Information Discussion Voting</p>	<p>Discussion Political activity</p>	<p>Information Discussion</p>
<b>Preferred forms of democracy</b>	<p>Direct</p>	<p>Direct</p>	<p>Representative</p>

Source: Hagen, 1997

The typology proposed by Van Dijk (2000) is based fundamentally on the models of democracy elaborated by David Held and on the concepts extracted from communication theory.

This author establishes six categories of democracy: a) legalist democracy, b) competitive democracy, c) plebiscitary democracy, d) pluralist democracy, e) participative democracy, f) libertarian democracy. Two criteria are used to constitute these six categories: i) the objectives and meanings of democracy and ii) the preference for democracy.

## *Effectiveness of e-Cognocracy. A social-economic approach*

Below, we explain the six aforementioned categories of democracy established by Van Dijk (Table 2.2. shows the types of electronic democracy proposed by the same author):

- a) Legalist democracy corresponds to the classic liberal model of Locke and Montesquieu. It is based on the Constitution and on law, the separation of powers (executive, legislative and judicial) and the establishment of a system of controls and counterweights between these powers. Democracy would be a method of safeguarding the freedom of individuals from the power of the Leviathan. The model rejects both direct democracy and the adoption of representative democracy. ICT are used as a means to eliminate the deficit of information and to strengthen the political system through a more efficient use of the processing of the information, as well as to increase the levels of transparency of the Administration. Applications of ICT within this approach consist basically of online information campaigns and public Administration information centers. The aim is for ICT to fulfill two functions: i) to provide more and better information to rulers, bureaucracies, representatives and citizens and ii) to encourage interactivity between the government and society.
- b) Competitive democracy is based fundamentally on representative democracy. The most important act of the democratic system is the moment of the election of the representatives by the voters. Politics is considered to be a competition between the political parties and their leaders to obtain the support of the electorate. In a model with these characteristics, the use of ITC is focused on the elections and the electoral campaigns.
- c) Plebiscitary democracy proposes the opening of channels of information between the government and the citizens with the objective of strengthening the voice of the citizenry. It defends direct democracy rather than representative democracy. The application of ICT in this model is centered on online surveys, online referendums, tele-voting by telephone, interactive television and telematic networks.
- d) Pluralist democracy: this political system is made up of multiple centers of power. It is a concept of politics that is online and decentralized. In the pluralist

model, the sovereign power does not rest with the majority but with a changing coalition of minorities. At the same time, this model consists of a combination of direct and representative democracy. ICT are attractive for the pluralist democracy, fundamentally, in the multiplication of channels and means of communication because they favor the plurality of political information. The tools most used in this model are those that permit these interactive interchanges: e-mail, discussion lists or videoconferences.

- e) Participative democracy combines direct and representative democracy. It is based on educating citizens to become active members of the community. Therefore, one of its indispensable requirements is to provide the maximum possible information to citizens, opening the centers of power to their participation. The use of ICT is aimed at achieving these objectives of educating informed citizens who are active and participative. Discussion lists in public telematic networks, videoconferences and electronic town halls are the tools most employed in this model.
- f) Libertarian democracy is closer to direct than to representative democracy. It defends virtual communities, the use of online surveys and of horizontal communications between individuals. The fundamental element is an emphasis on the political autonomy of the citizens and of their organizations through the use of the horizontal communication capacities that ICT offer. For the defenders of this approach, political institutions are obsolete and must be substituted by a new political reality based on digital networks. The role of ICT is fundamental in the creation of this new reality in three aspects: i) citizens must be well informed; ii) citizens must be capable of debating this information through all types of mechanisms and tools that facilitate horizontal communications (news groups, discussion groups, chats, e-mail, etc.) and iii) guarantee conditions in which citizens can give their opinion and their vote adequately.

**Table 2.2.** Van Dijk's types of electronic democracy

<b>Primary Goal</b>	<b>Decision making</b>	<b>Opinion Formation</b>
<b>Primary means</b>		
<b>Representative Democracy</b>	<b>Legalist</b> <b>Competitive</b>	<b>Pluralist</b> <b>Participative</b>
<b>Direct democracy</b>	<b>Plebiscitary</b>	<b>Libertarian</b>

**Source:** Van Dijk (2000)

Lastly, Bellamy, Hoff, Horrocks and Tops (2000) propose four models of electronic democracy: a) consumer democracy, b) demo-elitist democracy, c) neo-republican democracy and d) cyber-democracy. The four models are associated with different agendas that implement different policies depending on their own perceptions of the threats, challenges and opportunities of ICT in the sphere of democracy.

- a) Consumer democracy draws its inspiration from authors such as Schumpeter and the approach of public election and rational election. This model is based on two main characteristics: i) the value of the vote and of elections as the most important element of political life and ii) the dominant role of bureaucracy in the workings of contemporary democracies and, as a result, the necessity of giving citizens the maximum degree of information, both in quantity and in quality, to improve relations between the citizens and bureaucracy.

This model proposes, as its primary rule, the principle that citizens must receive relevant information flows in order to become more demanding and qualified. Thus, the use of ICT must be directed towards making public service users more active and selective, in short, more demanding. For its part, the government must direct the application of ICT to creating communications channels that make it possible for the preferences of citizens to be taken into account when making decisions and, in consequence, to satisfy their demands.

- b) The elitist or neo-corporatist model has its origins in social-democratic thought, and affirms that, in modern welfare states, the population is more interested in its socio-economic rights than in demands for greater participation. The principle function of public opinion, more than conducting and guiding its policies, is to legitimize the government.

The use of ICT in this model highlights measures aimed at improving the quality of electoral mechanisms: the decentralization y delocalization of the places where votes can be cast, the use of the Internet in electoral campaigns, interactive on-line conversations between representatives and voters, forums and electronic debates.

- c) Neo-republican democracy is based on an active conception of the citizenry that has its antecedents in three traditions of political theory: i) communitarianism; ii) Aristotelian thought, that defends the active and participative life of the individuals in the affairs of the polis and iii) Marxist humanism and that of the radical left. In this type of democracy, politics is conceived as a shared activity that leads people to overcome the individualism of the market to obtain work and, through its conflicts, to seek social welfare. With respect to the use and role of ICT, the defenders of this approach believe that the new technologies can serve to construct an electronic replica of the Athenian agora or the North American town meetings.
- d) Lastly, cyber-democracy is a model that is still in the process of formation and, hence, is subject to modifications. The origin of this type of electronic democracy is the establishment of the importance of identity as the lynchpin of the political and social dynamics of advanced societies. ICT, because of their communications potential, give rise to a cyberspace in which different virtual communities can create and recreate their identities with complete freedom, without being subject to imposed categories. The emergence of autonomous and self-referential virtual computer networks can play an important role in the pluralization of postmodern society and in the reconstruction of politics on a foundation of respect instead of the present patterns of tolerance. In this vision, cyber-communities can profoundly challenge the old politics, one that offered a

false security and a fragile cohesion based on marginalizing and making invisible “the others”, those that are different.

Below, in Table 2.3, the types of electronic democracy according to the authors Bellamy, Hoff, Horrocks and Tops can be seen.

**Table 2.3.** Bellamy, Hoff, Horrocks and Tops’ types of electronic democracy

	<b>Consumer</b>	<b>Demo-elitist</b>	<b>Neo-republican</b>	<b>Cyber-democratic</b>
<b>Perspective on the citizenry</b>	Neo-liberal	(Pluralist) Liberal	Republican/social-democrat	Communitarian/ radical democracy
<b>Democratic value</b>	Freedom of vote	Efficacy	Deliberation and participation	Community, acceptance of diversity
<b>Political nexus</b>	“The moment of truth” (producer/consumer relation)	Expert discourse	Public sphere, the media	Electronic debate (Internet)
<b>Central form of political participation</b>	Election of public services	Creation of consensus, <i>lobbying</i>	Public debate, associations	Virtual debate, virtual and real actions
<b>Main political intermediary</b>	Declaration of services, consumption data	Institutions of negotiation and of campaign	Meetings, hearings (real and virtual)	Electronic networks, electronic communities
<b>Dominant procedure norm</b>	Skills development (rights)	Development of acceptable political system	Development of identities, development of acceptable political system	Development of identities, development of skills (competences)

**Source:** Bellamy et al., (2000)

## **2.5 FROM E-DEMOCRACY TO E-COGNOCRACY**

It has been commented several times in this thesis that the development of ICT is permitting new forms of interaction between citizens and political parties. More and more, they are the tools employed to foment this interaction.

Building on the development of technology, it is also necessary to carry out a profound reflection on the direction that democracy must take in the future and on the possibilities offered by the Web. It is important to offer society technological conditions

in which all individuals can intervene directly, on an equal footing, avoiding the so-called digital divide (see Chapter 1, section 1.5). Furthermore, it will be necessary to guarantee the technological and juridical safety of the Web, as well as to create a climate of trust in electronic government from all concerned (Moreno-Jiménez, 2006).

Although the term electronic democracy is yet to be broadly implanted in society, most citizens accept the objectives and proposals of e-Democracy. They consider that new forms of participation are necessary. In particular, a tool, based on communications technology, is required for taking public decisions, one which permits the implication of civil society in the process of the government of the people, by the people and for the people (Moreno-Jiménez, 2006).

Social systems are, in general, dynamic, self-organized systems in a continuous process of improvement, whereas traditional democratic models are static and have the delegation of the representation of the citizenry as their goal. At no time, except on rare situations such as a referendum, are citizens permitted a direct implication in decision making and in the government of society (Moreno-Jiménez et al., 2005).

At present, there is a “social opportunity cost” associated with not using democracy for purposes that are more ambitious and of greater transcendence for the human race, in general, and for the world in which it is immersed, than the mere election of the managers of the system (Moreno-Jiménez et al., 2005).

To address these inconveniences, a new model of democratic representation has been proposed (Moreno-Jiménez, 2003, 2005; Moreno-Jiménez and Polasek, 2003): e-Cognocracy.

## **2.6 CHARACTERIZING E-COGNOCRACY<sup>17</sup>**

The consideration of human beings in a holistic and systemic context that brings together the interdependencies between the actors, factors and elements involved in

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<sup>17</sup> All this section (except the section 2.6.6.2) is based on the paper: Moreno Jiménez et al., 2015 (it is being evaluated)

decisional processes and the search for knowledge as an essential criterion that guides the behavior of individuals and of systems, have led to the development of democratic alternatives that reflect these ideas and that, in accordance with the evolutionism of living systems, are aimed at the creation and socialization of knowledge (Moreno-Jiménez, 2006).

As is stated in Moreno-Jiménez (2003b), *there is no democracy without freedom, or freedom without knowledge*. Thus, efforts must be made towards the diffusion among citizens of the knowledge derived from the resolution of the problem, that is, the knowledge related to the evolution of the behavioral patterns of the actors involved in that evolution and of the critical points and opportunities in the decision-making process.

While traditional democracy was characterized by the idea of “one man, one vote” and by the fact that decisions are filtered by the political parties, e-Cognocracy is characterized by the idea of “one man, many ideas” and by the fact that these ideas are filtered by the citizens themselves through their transparent and public selection in the Web (Moreno-Jiménez et al., 2005). Decisions are still made by the majority of the citizenry, as in representative democracy, but now, in e-Cognocracy, no idea is excluded from the process of resolution. All of them are incorporated into the Web and are refined and selected there.

The new democratic system (e-Cognocracy) seeks to convince the citizenry of the adequacy of a determined decision that is constructed by all through the Web. It does not seek, as often occurred in traditional democracy, to beat or dominate adversaries by obtaining half plus one of the seats at stake and, on that basis, to take decisions that, in many cases, have nothing to do with their initial electoral programs (Moreno-Jiménez, 2005).

### **2.6.1 Origin**

E-Cognocracy was proposed in September 2003<sup>18</sup> as a way of integrating immigration into the so-called Knowledge Society (Moreno-Jiménez, 2003a). The

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<sup>18</sup> At the beginning of 2003, as part of the training activities organized by the Consejo General del Poder Judicial in Aragón, the organizer of these activities (the magistrate, Julio Arenere Bayo) invited José María Moreno to give a conference on the importance of subjective, intangible and emotional aspects in scientific decision-making. All of this took place within the framework fixed for that year which addressed immigration from different points of view.

initial idea was to pay back a country that had suffered from emigration with intellectual capital in exchange for the loss of human capital resulting from the migratory process. In order to do so, a procedure of citizen participation in public decision-making with respect to the governance of society was set up. It contemplated three groups of actors: representatives, citizens and emigrants. To guarantee the cognitive focus of the system of participation proposed (the generation of intellectual capital), two rounds of voting and an intermediate round of discussion were established, after which the arguments that support the different positions and decisions could be extracted.

The initial idea of the integration of immigration into the Knowledge Society was formalized (Moreno-Jiménez 2003b, 2004, 2006; Moreno-Jiménez and Polasek 2003, 2004, 2005) to give rise to a new model of democracy that, instead of adding yet another adjective to the term democracy, changes the noun so that its differences can be clearly appreciated.

E-Cognocracy, also called *democracy of the Knowledge Society* and *cognitive democracy*, is based on the evolutionism of living systems. These are characterized by three elements: (i) pattern (the autopoiesis of Maturana and Varela); (ii) structure (the dissipative structures of Ilya Prigogine) and (iii) process. The life process of living systems is a cognitive process. Only the species that learn and adapt to their context subsist (Moreno-Jiménez, 2006).

In accordance with the latter element, the mission pursued by e-Cognocracy is related to the subsistence of the species and is implemented through the continuous education of the citizenry in such an essential aspect for the human species as decision making. This education takes place with the diffusion of knowledge derived from the scientific resolution of the complex problems that arise in the sphere of public decisions related to the governance of society. For its part, knowledge refers to the arguments that support the different opinions and the decisions taken (Moreno-Jiménez, 2006).

### **2.6.2 Concept**

From a functional point of view, this cognitive democratic model combines representative democracy (political parties) and direct democracy (the citizenry) through weightings, usually proposed by the representatives who make the public decisions, which depend on the type of problem that is being considered. If the problem

has a local context, the weighting assigned to the citizen would be greater (around 2/3), if the problem has an international or supranational context, the weighting of the political parties would be greater (around 2/3) (Moreno-Jiménez et al. 2014).

The operational mechanisms of e-Cognocracy (Moreno-Jiménez 2006, 2009; Moreno-Jiménez et al. 2014) consists of six steps: (i) problem formulation; (ii) the first e-voting round; (iii) the on-line discussion; (iv) the second e-voting round; (v) knowledge extraction and diffusion; and (vi) evaluation.

### **2.6.3 Characteristics**

The new democratic proposal (e-Cognocracy) has the following characteristics (Moreno-Jiménez, 2006):

- i) It permits direct citizen involvement in decision making, thus encouraging their participation in the democratic system and the creation of knowledge in society.
- ii) The combination, and the balance in accordance with the weights assigned, of one public part (political parties) and another private (citizens) eliminates the risk of falling prey to an instantaneous plebiscitary democracy (Haskell, 2001) and to the populism to which the direct participation of the citizenry can lead (Kampen and Snijkers, 2003). Moreover, e-Cognocracy makes discussion between the public and private parts possible, as Bohman (1998) suggests.
- iii) It improves the transparency of the system by making public the justification of the criteria and the postures defended in each case by the different political parties, as well as any possible modifications to their electoral programs. This allows the confirmation of whether the decisions taken respond to the electoral programs presented and the identification of “social leaders”, that is, the individuals whose arguments are most followed and most influential on the Internet.
- iv) It improves the control of the system by permitting both the opposition and the citizens themselves to demand a contact point with the government (resolve a particular problem through the Web –e-Cognocracy–). This obliges the parties to win the vote of citizens on a daily basis, which reduces dishonest behavior on the part of the representatives.

- v) It lessens the dependence of the democratic system on minority political groups, stimulating the establishment of coalitions between majority parties to reduce uncertainty, something that tends to frighten politicians. This encourages the taking of stances that are more democratically focused and endorsed.
- vi) It improves the knowledge and the understanding of the system, incorporates a greater number of perceptions of reality, and foments discussion, debate about ideas, negotiation processes and the search for consensus.
- vii) It facilitates the continued education of the population that is interested in it (learning) in consonance with Rawlsian social justice (equality of social opportunities).
- viii) It permits an easy expansion and diffusion of knowledge (socialization of knowledge) as well as the creation of minimum ethical standards.
- ix) The multicriteria framework proposed for dealing with the most specific part of the process, the citizen's direct involvement, incorporates the subjective aspects through evaluations and judgments. An objective treatment of the subjective guarantees the *scientific nature* of the procedure that is followed. As Roy (1993) has noted, this scientific nature is generated by the rigour, transparency and accessibility of the method.

#### 2.6.4 Objectives of e-Cognocracy

The general objective of e-Cognocracy is to help to improve people's quality of life through the creation and diffusion of knowledge, within a global and multicultural context, characterized by the existence of a new system of human relations (virtual and global community) that uses the Web as its communications support and the democratic system as the catalyst for the learning that guides the characteristic cognitive process of living beings (Moreno-Jiménez, 2003b, 2004).

The co-decision of the actors involved in the resolution of the problem and the education (individual and social learning) associated with the debate stage are two of the characteristics that distinguish this cognitive democracy, which seeks effective Public Administration, from other e-participative and deliberative approaches (Bessete,

1980; Barber, 1984; Zimmerman, 1986; Fishkin, 1991; Bohman, 1998; Elster, 1998; Dryzek, 2000; Saebo et al., 2008; Medaglia, 2012).

Jointly with the main aim of e-Cognocracy, which is the improvement of the citizens' quality of life by means of their education in decision making, there are a number of specific objectives:

1. Adapt democracy to the new times and needs.
2. Alleviate some of the limitations of representative democracy. In particular, to increase transparency and accountability of representatives and to increase the participation and control of citizens.
3. Alleviate some of the limitations of direct democracy. In particular, to reduce the populism of direct democracy and the lack of a global and long-term perspective.
4. Reduce the gap that exists between those represented and their representatives
5. Co-decision between citizens and the representatives.
6. The co-creation of a better society.
7. Foment the use of new technologies in communication, discussion and decision.
8. Reduce the democratic system's dependence on minority political groups.
9. Facilitate the continuing education of those interested through the online discussion that takes place between the two voting rounds.
10. Share and extend the knowledge associated with the scientific resolution of the problem.
11. Incorporate cardinal intensities for preferences and subjective and intangible aspects.
12. Foster the search for consensus in negotiation processes.
13. Promote global democratic values
14. Facilitate social cohesion
15. Permit the direct participation of citizens in their own government, heeding the wishes of the majority but collecting the opinion of the minorities expressed through the Internet.
16. In sum, to improve the effectiveness of the classic democratic system that is associated with the bettering of the citizens' quality of life.

### 2.6.5 Principles of e-Cognocracy

E-Cognocracy fulfils all the principles contemplated for experiences of e-Participation (which are explained in detail in Chapter 3, Section 3.2.4). It incorporates the objective information provided by the Administration and the subjective preferences of the decision makers. Moreover, there is another series of principles directly related to the concept “electronic” that aim to guarantee the technological security of the two stages of voting, in which are included the intensities of the preferences, and of the discussion stage, where the positions of the participating actors are justified, contemplated in the methodology (operational mechanisms) corresponding to e-Cognocracy (Piles et al., 2006a, 2006b, 2007; Salazar et al., 2008, 2010; Turón et al., 2010; Moreno-Jiménez et al., 2009; 2011).

As well as the principles related to the concept of e-Participation (which are explained in detail in Chapter 3, Section 3.2.4), there are a series of principles related directly to the concept “electronic” that are aimed at guaranteeing technological security both in the two stages of voting contemplated in the methodology corresponding to e-Cognocracy and to the stage of discussion included between the two votes. It should be highlighted that these two voting processes do not refer to the election of representatives but to the incorporation of the opinions or preferences of the actors involved in the resolution of the problem. These principles are (Moreno-Jiménez et al. 2007).

(1) *Information*: As a previous step to elections, users should be provided access to information, both the information necessary to discriminate between the alternatives and about the specific conditions of the process (days, timetables, places, conditions,...).

(2) *Reflection*: In all voting systems, a period should be available so that users can decide how they are going to vote and, during this time, publicity on the subject of the vote is not permitted.

(3) *Petition*: Access to the telematic voting media asking users to vote for one option or another (publicity, banners, etc.) should not be allowed.

(4) *Authorization*: Voting should only be permitted for users that have the corresponding authorization, that is, those that form part of the census.

*Effectiveness of e-Cognocracy. A social-economic approach*

(5) *Privacy*: The privacy of the vote should be guaranteed both at the moment in which it is cast (nobody should know how the user has voted) and when it is delivered (nobody should see it), as well as when it is counted (the content of the vote must not be able to be related to the voter).

(6) *Incoercibility*: It will be necessary to avoid voters being able to sell their vote or be forced (physically or psychologically) to cast it in a given way.

(7) *Authenticity*: Before allowing a user to vote, he/she must be unequivocally identified by the system, authenticating the voter.

(8) *No-duplicity*: When the user has cast his/her vote correctly, this fact must be registered in the system to avoid the possibility of voting again.

(9) *Integrity*: The system should preserve the user's vote in all the phases of the process (from its casting to its reception and counting) to avoid any type of modification or loss.

(10) *Reliability of the result*: The system should be operated by trustworthy personnel. Furthermore, the different operations should be separated so that one single person cannot manipulate the whole system by him/herself.

(11) *Auditability*: The voting system should have mechanisms to permit both its operators and external and independent personnel to check that it is working correctly.

(12) *Impartiality*: To avoid possible influences on voters, the system should not show partial results of the vote (except to operators and controllers to check whether the system is working correctly).

(13) *Safe counting*: When the period for voting has ended, the system must permit a fast and safe counting of the votes, without any internal or external element being able to modify the existing votes.

(14) *Accuracy*: The system must be able to provide completely accurate results, without any margin of error. The objective is to avoid possible discrepancies when there is a small margin between two or more candidates.

(15) *Safe storage of the vote*: When the urns have been opened and all the votes have been counted, it is necessary to store them safely until the publication of the definitive results in case a recount or revision of all or part of the votes is necessary.

(16) *Verifiability*: When the user casts his/her vote, he/she should receive a receipt to verify, when the voting is finished, that the vote has been cast successfully and has been counted.

(17) *Usability*: The system must use guides, provide information and, in general, be simple enough for any type of user to be able to use it without problems.

(18) *Transparency*: The system must be able to be examined by anyone who so wishes and to be able to have its correct working checked. At the very least, it should be examined by a group of independent and recognized experts to certify its correct design and operation.

As well as these properties that are common to most electronic voting systems, there is another property, specific to e-Cognocracy, that must be guaranteed in the voting process.

(19) *Linkability*: The system, in order to extract knowledge and identify the learning, individual, collective and of social leaders, should allow the linking of the votes in successive rounds and the messages posted in the discussion phase, without linking to the voter.

Along with the previously mentioned characteristics, the main differences of e-Cognocracy with respect to other participative and deliberative democracies are (Moreno-Jiménez et al. 2014): (i) its cognitive and decisional orientation, it is not only deliberative or discursive - it takes advantage of the creative capacity of human beings when resolving complex problems and permits co-decision making between citizens and representatives; (ii) e-Cognocracy allows the incorporation of intensities in preferences and the aggregation of individual rankings to reach a collective ranking. This is one of the traditional limitations of participative democracies (Weimer and Vining, 1999); (iii) it allows for the identification of social leaders; (iv) e-Cognocracy provides the arguments that support the different opinions, positions and decisions

(Moreno-Jiménez, Cardeñosa et al., 2013); (v) it generates a process of the continuous education of the citizen that is in keeping with the life processes of living systems (cognitive process); and (vi) the methodology permits the evaluation of both the individual and social learning that is derived from the scientific resolution of the problem, as well as the democratization of the knowledge that is extracted.

### **2.6.6 Scope of e-Cognocracy**

As has been mentioned, the main aim of e-Cognocracy is the improvement of citizens' quality of life through their continuous education in such an essential aspect for the human race as the taking of decisions. To foment this education, e-Cognocracy uses *multicriteria decision techniques* as its methodological support to guarantee the scientific rigor of the decision-making processes; *internet* as its communications support to facilitate interconnection (design, deliberation, co-creation and co-decision) between the actors involved and, finally, *democracy* as its catalyzing element because it provides the starting problem of the cognitive process (learning) that permits the improvement of the quality of individuals and of the systems in which they are integrated.

#### **2.6.6.1 Areas of e-Cognocracy**

In accordance with the four dimensions (participation area, stakeholders involved; level of engagement and stages in policy-making) contemplated in the classification for the scope of e-Participation (Wimmer, 2007) (see Section 3.2.5 of Chapter 3), e-Cognocracy is not limited to any of the levels therein contained. E-Cognocracy offers a global framework for any type of experience of e-Participation under whose umbrella can be gathered the elements contemplated in the four dimensions considered when analyzing e-Participation experiences: (i) the end pursued in the resolution of the problem (participation area); (ii) the actors involved in the problem (stakeholders involved); (iii) the level of involvement (level of engagement) and (iv) the stages contemplated in the process of resolution (stages in policy-making).

Moreover, some distinctive characteristics of e-Cognocracy would recommend the incorporation of new elements in the four dimensions considered in Wimmer (2007). In particular, among the aims (areas of e-Cognocracy) pursued by e-Cognocracy would be found: co-creation in the different stages of the scientific methodology used in

the resolution of the problem; co-decision between representatives and those represented when selecting the best option and, especially, the cognition that characterizes this new form of social organization.

#### **2.6.6.2 Stages of e-Cognocracy in policy making<sup>19</sup>**

At present, as has been commented previously, new tools and applications, associated with the concept of Web 2.0 and that permit the interchange of information, are available, fomenting and improving the possibilities of citizen participation. Citizens are growing accustomed to this new way of life, in which they generate and publish their own ideas and share them and communicate with each other through the Internet. Furthermore, they want to be listened to by the administrations. For the first time, citizens can participate democratically in what surrounds them, without having to wait for elections.

The e-Cognocracy-based methodology proposed for the conjoint design (politicians, citizens and other political actors) of public policies in a local environment consists of 16 stages grouped in four blocks (see Fig. 2.1): (1) Problem Formulation, Step 1 of the e-Cognocracy methodology; (2) Problem Resolution, Steps 2 to 4 of the e-Cognocracy methodology; (3) Knowledge Extraction and Democratization, Step 5; and (4) Evaluation and Documentation of e-Cognocracy, Step 6 (Moreno-Jiménez et al., 2014):

##### **2.6.6.2.1 Problem formulation**

*Stage 1: Problem presentation.* A key aspect for achieving the participation of citizens, putting forward ideas, making suggestions and conjointly creating a better society, is to make sure that they understand the underlying philosophy and see their involvement in the process as a civic virtue, as democracy was seen in ancient Greece. This task requires education on the part of the Administration which must communicate the message and generate citizen motivation.

*Stage 2: Problem setting.* From the point of view of decision theory, it is more and more accepted that the satisfactory resolution of the problem requires an appropriate formulation of the problem; ‘a problem that is well set is halfway to being resolved’. In

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<sup>19</sup> Section extracted from the published article: Moreno-Jiménez et al., 2014.

the past, this stage received scant attention but it is now considered as essential in the search for the effectiveness of the resolution procedure to avoid what is known as the 'Type III' error (solving the wrong problem). The context must be clearly defined, the possible scenarios must be identified and the controllable and non-controllable variables must be analysed.

#### **2.6.6.2.2 Problem resolution**

*Stage 3: Identifying the actors, factors and alternatives.* Once the problem has been set by the representatives, in some cases by the citizens, the actors and their interdependencies, the factors - criteria, the subcriteria of different orders and even the attributes - their interrelationships and the alternatives are identified.

*Stage 4: Problem modelling.* This is the joint construction of a model in which all the relevant aspects of the problem are represented. In general, modelling involves three blocks (Moreno-Jiménez et al., 1999): the first deals with the most ambiguous and open part of the problem (scenarios, actors etc.) and is usually carried out through a network that captures the interdependencies; the second refers to the best known part of the problem and includes the tangible and intangible criteria, the subcriteria of different orders and the attributes (subcriteria from which the alternatives hang) and usually takes the form of a hierarchy; the third block considers the problem alternatives and their measurements with reference to the different attributes. This final block is modelled by means of a table of effects or a payment matrix. When the problem is modelled, the balance between precision and functionality must be taken into account.

*Stage 5: Valuation I.* This involves the incorporation of the preferences of the citizens and the politicians in the first round. The e-Cognocracy process usually considers two rounds in order to incorporate the creative power of the collective whilst, at the same time, evaluating individual and social learning. The incorporation of the preferences of the actors involved in the resolution of the problem is based on Saaty's Analytic Hierarchy Process –AHP– (Saaty, 1980) and uses paired comparisons for the evaluation of intangible aspects. The use of AHP is justified as it is one of the multicriteria tools which best captures the holistic vision of reality and best responds to the needs and challenges of the resolution of problems in the KS. AHP considers multiple scenarios, actors and criteria and integrates the very large with the very small

and the rational with the emotional. It is important to note that, when the preferences of the citizens are emitted, the proposed procedure permits the incorporation of the intensities of the preferences and, in contrast to traditional methodologies, is not limited to a binary, exclusionary, selection for the posterior application of majority rule.

*Stage 6: Determination of initial positions.* From the judgements emitted in the previous stage, *local priorities* are determined through the use of any of the prioritisation procedures commonly employed in AHP. The *global priorities* are obtained through the principle of hierarchical composition and the *total priorities*, or priorities of the alternatives in relation to the mission, of the problem are calculated through an aggregation procedure. When working with intangible aspects, and, in general, in the field of social sciences, conclusions that are extracted exclusively from precise values are meaningless. In these types of situations, the incorporation of the uncertainty that exists in the emission of judgements through judgment intervals or reciprocal distributions (Escobar and Moreno-Jiménez, 2000) and calculation, through simulation, of the preferences associated with each individual is recommended (Escobar and Moreno-Jiménez, 2007). From the analysis of the rankings of the alternatives and the preference structures derived from the contemplation of uncertainty, patterns of behaviour can be identified, for example, the percentage of the population that follows each of the preference structures that are being considered.

*Stage 7: Citizen debate and discussion.* Through the use of a collaborative tool or social network software, for example, a forum, both politicians and citizens (registered voters or not) put forward or incorporate arguments for and against the different criteria and alternatives (Moreno-Jiménez et al., 2012). The debate and discussion process begins with the presentation of the problem and the relevant information. The actors involved in the problem then open different discussion threads based on the initial comments and messages received. Each message or comment is associated with a numerical value and a scale (the importance of the message/comment for the sender – from 1 to 10, the importance for the reader –from 1 to 10, and the reader’s opinion, 1 – completely against, 5 – completely in favour) that allow the contextualisation of the messages.

*Stage 8: Valuation II.* After discussion and debate through the Internet, the actors involved undergo a learning process that is reflected in the new preferences emitted in the second round. Following a top-down or bottom-up procedure, citizens register their opinions or judgments in a second round using the same method for the incorporation of the preferences.

*Stage 9: Determination of the new positions.* When the new preferences have been incorporated, the new positions or behaviour patterns are determined by following the procedure outlined in Step 6. The new individual and collective rankings, obtained from an aggregation of the individual rankings, enable the identification of the changes in individual and collective ordering after the forum discussion. Obviously, there will be individuals that change their preferences and priorities whilst others will maintain their positions with little alteration.

*Stage 10: System behaviour analysis.* In these types of situations, in which the unknown is much greater than the known, it is preferable to study the behaviour of the system before selecting the best alternative based on the consideration of precise values. Moving from the most general to the most specific (Moreno-Jiménez et al., 1998) this means: (i) analysing the validity of the approach; in this case, due to the reasons explained in Stage 5, we use AHP for modelling and resolving the problem; (ii) checking the robustness of the model - do the conclusions remain stable when the hierarchy of the problem is slightly modified?; (iii) considering the stability of the solutions when confronted with small changes in the judgments of the actors involved.

#### **2.6.6.2.3 Knowledge extraction and democratization**

*Stage 11: Assignment of messages to the alternatives and justification of positions:* Based on the quantitative (intensities of the preferences) and qualitative (written messages) information incorporated in the discussion stage, data and text mining techniques are utilised to extract the arguments that support the decisions (Moreno-Jiménez, Escobar et al., 2008; Moreno-Jiménez et al., 2009; Moreno-Jiménez et al., 2012; Moreno-Jiménez, Cardeñosa et al., 2013). From the intensities of the preferences (Moreno-Jiménez et al., 2008), the messages and comments are quantitatively assigned to the alternatives that they support. Employing data and text mining techniques, Moreno-Jiménez et al. (2009) were able to assign these same

messages and comments to the different alternatives for the problem by using expert opinion and the construction of a grammar for the problem. Moreno-Jiménez et al. (2012) have developed a decisional tool that supports both the quantitative and qualitative approaches to knowledge extraction.

*Stage 12: Evaluation of individual and collective learning.* A key aspect of the methodology that is especially related to the extraction and diffusion of knowledge concerning the scientific resolution of the problem is the identification of the social leaders, that is, the individuals that have influenced the behaviour of others through the expression of their opinions on the social network. The learning procedure is evaluated by measuring, using quantitative methods, the changes in individual and collective preferences made after the discussion process. To facilitate the internalisation of these changes, a graphic visualisation of the process is recommended wherever possible (Turón et al., 2008). The identification of the social leaders is a complex task that depends on the appellation given by the participants in the discussion process; the methodology allows for anonymous participation in the forum, participation under an alias or the use of the participant's real name. Due to the technological security measures employed in the evaluation procedure, it is not possible to check the real name of the social leaders. This stage can only identify the aliases or names that are used.

*Stage 13: Identification of arguments that support the decisions.* Once the messages and comments have been assigned to the alternatives, the previously mentioned quantitative and qualitative procedures are undertaken (Stage 11). This allows the extraction of the arguments that support the decisions based on the list of messages in favour of a particular alternative or position.

*Stage 14: Extraction and diffusion of knowledge.* The final stage of the cognitive process is the diffusion of knowledge. This requires methodologies that are easily understood by the citizenry. Graphic visualisations are an excellent support for the democratisation of knowledge. The collective learning (social wisdom) provided by the methodology can mitigate the impact of unusual events, for example, terrorist attacks, and their influence due to media exploitation.

#### **2.6.6.2.4 Evaluation and documentation**

*Stage 15: Effectiveness of e-Cognocracy.* All assignments of public resources should conclude with an evaluation of effectiveness (Mamaqui and Moreno-Jiménez, 2009; Moreno-Jiménez, Pérez-Espés and Rivera, 2013). This requires a clear understanding of the strategic objectives and the measurement of their alignment with the decisions that are taken.

*Stage 16: Documentation of the project.* Irrespective of the process of diffusion, when implementing a project on electronic citizen participation in the design of public policies in the local environment, it is always advisable to fully document the experience for future reference and for the posterior use of the model; this usually takes the form of a 'Final Report'. Other local authorities might wish to use the project as a template for projects in other municipalities in the region and, in the context of the KS, any municipality with similar characteristics. It should be remembered that interoperability<sup>20</sup> is one of the basic requisites in the design of public policies in the local environment.

A summary of these stages grouped by blocks can be seen in Figure 2.1.

Block 1, Problem Formulation, refers to the initial problem proposed by the representatives or by the citizens, its presentation to the actors involved in its resolution and its final setting.

Block 2, Problem Resolution, includes the two voting rounds, in which the scientific resolution of the problem is obtained using the Internet as a communication support and AHP as the multicriteria decision-making technique, separated by an e-discussion process in which the actors justify their preferences. The online discussion is the step prior to the extraction of knowledge that takes place in the third block. The discussion allows the creative capacity of all individuals interested in the resolution of the problem to be incorporated into the decision-making process and this is in accordance with Dahl's proposals (Dahl, 1989, 2000) on the improvement of democracy

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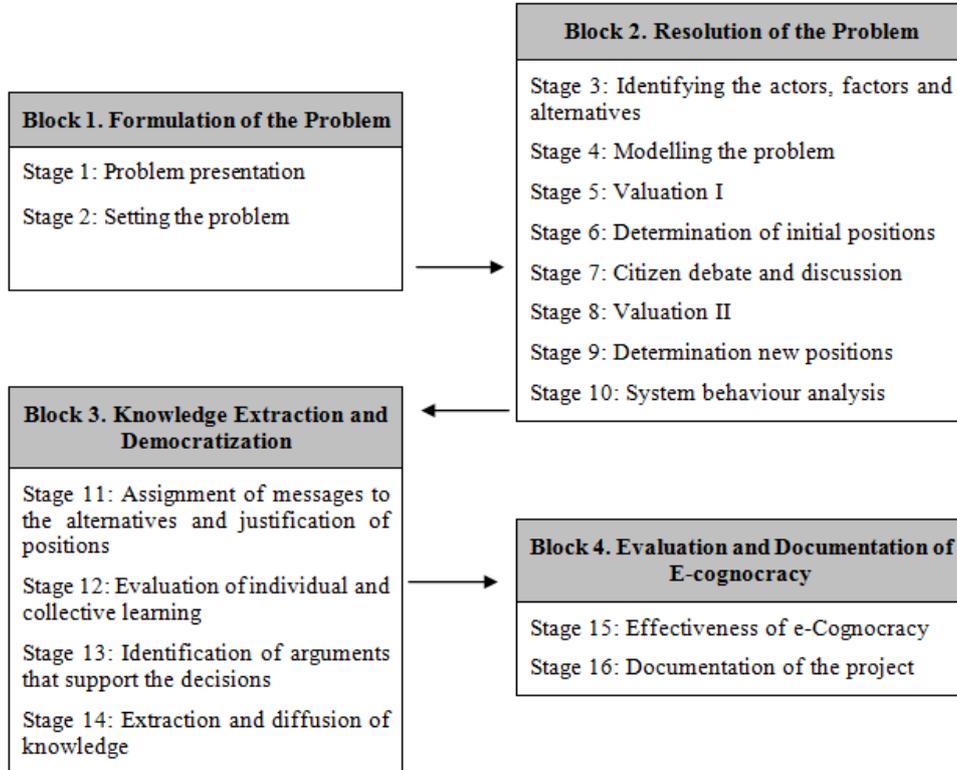
<sup>20</sup> Interoperability in the context of the design of public policies refers to the fact that the methodology, the tools and the procedures used in a specific context of the Administration can be replicated in other Public Administrations. If the new context corresponds to the same level (local, regional, national or supranational), the interoperability is horizontal; if it corresponds to a different level, the interoperability is vertical. When we replicate the methodology, tools and procedures in the same Administration, we can call it intra-operability.

based on the use of ICT. The e-discussion allows the active citizens, a *minipopulus*, to complement the institutions in order to reduce the gap between the representatives/politicians, and those represented/citizens. Moreover, the e-discussion fosters, as Habermas (Habermas, 1996) argue, the co-creation of a more cohesive, fair, educated and effective society.

Block 3, Knowledge Democratization, provides the arguments that support the different positions, identifies the social leaders, the citizens whose arguments are followed by the majority of the citizens, and shares the resulting knowledge to generate individual and social learning.

Finally, and as recommended for any procedure that makes use of public funds, Block 4, analyses the effectiveness (doing what is right), the efficacy (achieving goals) and the efficiency (doing things correctly) of the e-Cognocracy public policy-making process.

**Figure 2.1.** Blocks and stages of the e-Cognocracy-based methodology.



Source: Moreno-Jiménez et al., 2014

### **2.6.6.3 Level of engagement**

The level of participation has been discussed in the literature in different classification schemes.

An OECD study identifies three levels of participation: (i) *e-Information*: provision of information on the Internet, (ii) *e-Consultation*: organizing public consultations online, and (iii) *e-Decision-making*: involving citizens directly in decision processes (OECD 2001a).

According to Macintosh, there are three different levels of e-Participation: *e-enabling*, *e-engaging* and *e-empowering* (Macintosh, 2004). The first level is the use of technology to enable participation. *E-enabling* is about supporting those who would not normally access the Internet and make the most of the information available there by addressing the accessibility and understandability of the information. The second level is the use of technology to engage with citizens. *E-engaging* with citizens is concerned with consulting a wider audience to enable deeper contributions and support deliberative debate on policy issues. The use of the term ‘to engage’ in this context refers to the top-down consultation of citizens by government or parliament. And finally, the third level is the use of technology to empower citizens. *E-empowering* citizens is concerned with supporting active participation and facilitating bottom-up ideas to influence the political agenda. The previous top-down perspectives of democracy are categorized in terms of user access to information and reaction to government-led initiatives. From the bottom-up perspective, citizens are developing as producers rather than just consumers of policy (Macintosh et al., 2002). *Here there is recognition that there is a need to allow citizens to influence and participate in policy formulation* (Macintosh 2004). This concept is more concerned with active two-way participation mentioned by the OECD (Wimmer, 2007).

With respect to the level of participation associated with e-Cognocracy, in accordance with the previously mentioned proposals, e-Cognocracy should occupy an additional level to those traditionally contemplated. For the classification provided in the work of the OECD (OECD 2001), e-Cognocracy would have some connection with the last level (e-Decision Making), although e-Cognocracy is not limited to participating in the decision through the contribution of opinions (deliberative democracy); it

proposes a co-decision between representatives and those they represent and, above all, it incorporates cognition as the final stage of the scientific process.

In the classification of Macintosh (2004), e-Cognocracy would be related to e-Empowerment (the use of ICT to empower citizens). This level is also considered by Wimmer (2007) who reflects that to *empower* is to place the final decision-making in the hands of the public. This proposal is more related to the objectives considered for e-Cognocracy but still does not capture its two essential components: co-decision and e-cognising. The co-decision between the groups contemplated (habitually citizens and politicians) and the extraction of the arguments that support the decisions (cognition) are levels included in e-Cognocracy that are not found in other participation experiences.

#### **2.6.6.4 Stakeholders involved**

With respect to the actors involved, it should be mentioned that e-Cognocracy can incorporate as many groups or actors as are considered convenient, assigning each group the weight it has in the final decision.

## **2.7 APPLICATIONS OF E-COGNOCRACY**

E-Cognocracy has fostered research lines that extend to such diverse fields as politics, sociology, computer science, statistics, mathematics and economics.

Various practical experiments applying e-Cognocracy have been carried out, among which can be highlighted i) the “Online Participatory Budgeting” of the El Rabal neighborhood of Zaragoza (Spain) (2005/2006), ii) the integration of immigration (2006) iii) the proposal of a NATO intelligence base in Aragón (Spain) (2007), iv) the proposal of Gran Escala in the county of Los Monegros, Aragón (2008), and v) the latest experiment carried out so far was the electronic consultation for citizens to choose the design of the public policies in culture and sports of the municipality of Cadrete, province of Zaragoza (2010). This consultation is explained in detail in Chapter 3 of this Thesis (Section 3.6.1).

Below, we describe the experiments in e-Participation, using the model of e-Cognocracy, that have been carried out in the Autonomous Community of Aragón, Spain (Moreno-Jiménez and Velázquez, 2011):

Online Participatory Budgeting (Zaragoza, 2005)

The first municipal electronic consultation in Aragón was that carried out in the Council of Zaragoza by the Zaragoza Multicriteria Decision Making Group (<http://gdmz.unizar.es>) of the University of Zaragoza which was responsible for the methodological part (application of e-Cognocracy). It was a pilot project proposed by department of Science and Technology of the Council of Zaragoza and the Municipal Board of El Rabal. Using the Internet, the project (<http://www.zaragoza.es/ciudad/presupuestosparticipativos>) intended to conjointly (between the politicians and the citizens) assign the minor items of expenditure in the budget of the neighborhood (45,000 euros).

The objective of this project was to encourage direct citizen participation in municipal decision making and to create and socially spread the knowledge derived from the scientific resolution of the problems proposed in the sphere of public decisions, which is known as e-Cognocracy.

Online Participatory Budgeting (Zaragoza, 2006).

After the first pilot experiment (2005), a second electronic consultation was carried out in 2006 as a continuation of the project “Online Participatory Budgeting”. The carrying out of the project was the responsibility of the department of Science and Technology of the Council of Zaragoza and the Municipal Board of El Rabal in collaboration with the Zaragoza Multicriteria Decision Making Group. The objective of the consultation was to assign the minor items of expenditure in the budget of the neighborhood of El Rabal (47,000 euros) from among a set of alternatives selected by the residents’ association at the suggestion of the citizens.

Three facts stand out as novelties with respect to the previous consultation:

- The citizens themselves have been allowed to propose which actions were going to be taken into account when selecting where to assign the budget for minor expenses in the neighborhood in 2006 (47,000 euros).

- The actions proposed were posted on the council webpage to facilitate their identification.
- To encourage direct citizen involvement in public decisions, all those that had a digital certificate were permitted to vote as a third group of participants (political parties, residents' associations and citizens).

The integration of immigration:

E-Cognocracy, among other things, seeks to foment the existence of universal human rights, indivisible and interrelated, within the framework of democracy, self-government, freedom, ethics, equity, knowledge and evolutionism. In accordance with the petitions of the European Union itself with respect to the social phenomenon of immigration, this experience has provided a tool that can be used to give a global response to a global problem. If information is the driver of the cognitive process, immigration is the driver of a new multicultural social phenomenon that will have to be organized permitting the participation, transparency and responsibility of individuals in the governance of society (Moreno-Jiménez, 2006). In this context, an analysis was carried out about how ICT, democracy and immigration could influence the creation of a new system of human relations (virtual and global community) that uses the Internet as its communications support and the democratic system as the catalyst of the learning that guides the cognitive process characteristic of living systems.

Location of a NATO intelligence base:

This pilot experiment aimed to extract knowledge about the opinion and preferences of the participants at the seminar of the E-Commerce Symposium (Jornadas de Comercio Electrónico) with respect to the installation of a NATO intelligence base in Zaragoza, and to determine whether the group of participants thought it convenient or not to locate the base in the city of Zaragoza or in its surroundings.

The stages of the experiment were the following: i) modeling, evaluation and prioritization (AHP), ii) discussion, argumentation and feedback, iii) prioritization and conclusions.

The modeling stage was, in turn, composed of:

- Four criteria:
  1. Benefits: This attribute reflects the economic and social improvement of the city of Zaragoza and its adjacent region that is motivated by the directly associated economic activity (wages, consumption, improved air and land infrastructures, positive impacts, qualified employment, security...)
  2. Cost: This attribute reflects the negative short-term effects associated with the installation of the base.
  3. Opportunities: This attribute includes the directly and indirectly generated qualified employment, the attraction of new businesses and public services, various new networks, fomenting the development and greater knowledge of the city worldwide, synergies with new technologies and other projects of the logistics sector already in motion in the city, improving Spain's political position among its NATO partners, supporting the fight against terrorism...
  4. Risks: This attribute reflects terrorist attacks, plane crashes, the conditioning of the possibilities of development of the city, social rejection, demonstrations of antimilitary and alternative groups, increased delinquency, negative impact on tourism, acoustic impact
- Three alternatives: A1: Install, A2: Install at a distance of more than 50 km from the center of the city of Zaragoza y A3: Not install.

#### Location of Gran Escala:

Five universities and 29 professors belonging to 12 research groups and 10 knowledge areas set in motion an experiment, the aim of which was to find out the opinion of the students at the University of Zaragoza about the location of the enormous leisure project, Gran Scala, in the county of Los Monegros (Aragón). The experiment proposed an intelligent system which, from the comments and opinions of the students, categorized the arguments supporting the decisions taken, one of the key aspects of the model of citizen representation known as e-Cognocracy.

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# CHAPTER 3

## EFFECTIVENESS OF E-COGNOCRACY

### 3.1 INTRODUCTION

The traditional democratic model has important difficulties to react effectively in complex, uncertain and dynamic environments like the present one. The growing alienation between the representatives and those represented reflects a deterioration of the democratic legitimacy of public institutions for a citizenry that is, with each day, better trained and more reflexive, critical, demanding and participative (Pérez Espés et al., 2011).

One of the most important characteristics of democratic political systems is that of offering mechanisms of interaction with their constituents and facilitating the existence of modalities of citizen participation. Putman (1993) already indicated that participation is no longer a discourse charged with rhetoric and utopia but the best guarantee for “making democracy work”. Without citizen participation, democracy loses its *raison d’être*, representativity and legitimacy.

According to (Blumler and Coleman, 2001), a threefold combination of facts made a more participatory style of democracy desirable: i) a “crisis of democracy”; ii) a simultaneous rise of internet penetration and iii) a significant turn in democratic theory towards a more deliberative view of active citizenship.

Over the past decade, the inclusion of citizens in political decision-making through electronic participation (e-Participation) has received much attention. Many projects have been, and continue to be, executed at different levels of government. E-participation projects aim at providing an online environment, where citizens and other relevant actors can be involved in the processes of public decision-making. Up to now, the evaluation of the success and impact of such projects has not been addressed widely in research (Pérez-Espés et al., 2014).

The OECD stated in a report that one major challenge was “*evaluating e-participation: making sense of what has, or has not, been achieved; understanding how to assess the benefits and the impacts of applying technology to the democratic decision-making processes*” (OECD, 2003). Since then, and with the growing academic literature on e-Participation, a number of papers that discuss methodological frameworks for the evaluation of e-Participation experiences have emerged (e.g. Rowe and Frewer, 2000; Macintosh and Whyte, 2008; Aichholzer and Westholm, 2009; Wimmer and Bicking, 2013). However, so far, these evaluation approaches have been restricted to project-related aspects or are not yet rigorous enough to assess the wider impact of an e-Participation endeavor (cited in Perez-Espés et al., 2014).

Aichholzer and Westholm (2009) affirm that “*evaluation of e-Participation is indispensable if knowledge of greater precision and objectivity is wanted about the effectiveness, the value, the success of an e-Participation project, initiative or programme*”.

Especially when an e-Participation experience or project is financed by public funds, evaluation and, in particular, wider impact assessment should be mandatory. Although the importance of evaluation of e-Participation projects is recognized by government and academia, rigorous evaluations of e-Participation are hard to find (Macintosh and White, 2008).

This chapter studies the concept of e-Participation and existing evaluation approaches in detail. Furthermore, a theoretical framework based on the EF3-approach for the evaluation of e-Cognocracy is presented. The theoretical EF3-framework was first applied to a survey implemented in the real-life experience of Cadrete using Structural Equation Models (SEM) or the Covariance Structure Analysis approach

(Bollen, 1989; Bollen and Lennox, 1991; Jöreskog and Sörbom, 1996 and Bentler, 1995-2006). Due to the limited number of responses (20 valid), it was not possible to validate a general framework for the conjoint evaluation of all the aspects outlined in the theoretical EF3-framework (Moreno-Jiménez, Pérez Espés and Wimmer, 2013). However, the use of this approach has allowed us to obtain ideas for extending the existing theoretical EF3-framework and, together with studying the existing literature, to extend this framework to evaluate any e-Participation experience, not only e-Cognocracy. The extension of the theoretical EF3-Framework is composed of three criteria and the corresponding indicators for each of the criteria. Moreover, this framework has been validated by international experts who also assigned weights to individual indicators for each of the three criteria. The validated framework was called the EF<sup>3</sup>-framework. Finally, this framework (EF<sup>3</sup>-framework) was applied to the e-Participation real-life experience of the municipality of Cadrete (Zaragoza) to provide a proof of concept for assessing the impact of e-Participation, and the experience has been evaluated in terms of effectiveness, efficacy and efficiency, using a multi-criteria technique.

## **3.2 CHARACTERIZING E-PARTICIPATION**

This section reviews the extant literature on e-Participation. First, we analyze how the term electronic participation arose. Second, we present the evolution of the concept throughout history. Third, we study the objectives and principles pursued by e-Participation. Finally, we analyze the dimensions that electronic participation may adopt in the near future.

### **3.2.1 Origin**

The term e-Participation or electronic participation is still a new concept that started to appear at the beginning of the 90s and for which there is, as yet, no consensus in the scientific literature as to its definition, mainly due to the broadness of the basic concept of the verb *participate*. In general, to participate is to take part in something. However, this “*take part*” is so ambiguous that it can give rise to numerous

interpretations, sometimes contradictory, depending on the way it is carried out (directly or indirectly, top-down or bottom-up), the sphere of application (local, regional, national...), the end pursued (management, opinion, discussion, decision, cognition...), etc. Sartori (2003) defines participate as taking part in something personally. For Sartori, participation is moving oneself. Not others moving you or being moved from above. The term participation also involves “*enabling people to realize their rights to participate in, and access information relating to, the decision-making processes that affect their lives*”<sup>21</sup>.

In the social-political context (Garcia and Moreno-Jiménez, 2008), the idea of participation forms part of a wider current that contemplates it as a key element for a new democracy (García Lizana, 1982; Chambers and Kymlicka, 2002). It is also linked with the idea of social capital, understood as a set of norms and connections that permit collective social action (World Bank, 2008). In this case, participation is contemplated as an agglutinating and driving element of societies, which, obviously, which can be stimulated by, as well as stimulating, the deliberative process.

The second term that makes up the neologism e-Participation, that is, the “e” of electronic, refers simply to the use, through any of the existing mechanisms, of communication technologies, particularly the Internet, as the technological support of participation.

At first, much of the work that spoke about e-Participation, referring to political e-Participation, contemplated it from the perspective of electronic democracy, whose objective is to promote the use of ICT to obtain a more direct model of democracy (Rheingold, 1993; Budge 1996; Negroponte 1996). At the end of the 90s, a new, more informal and radical approach to e-Participation emerged that paid attention to the use of the Internet, on the part of organizations, as a means of coordinating protests and collective action (Bonchek 1995, Bennett 2003). Later, these studies focused on showing how the Internet reduced the problems that collective action presented (Bimber et al. 2005).

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<sup>21</sup> Participatory Dialogue: Towards a Stable Safe and Just Society for all (2007). United Nations Economic and Social Council, page 13.

In this more informal context, the impact of the Internet on individual political attitudes began to be studied. Attention was centered fundamentally on questions of citizen mobilization and on the influence of the Internet on political participation (Bimber 1999; 2001). At the same time, there appeared authors (Levy, 2000) that already anticipated the role of ICT as tools that facilitate and permit the development of a direct democracy through the computer, a sort of virtual agora.

Notwithstanding the lack of agreement as to the definition of e-Participation, there are two facts on which all coincide: (i) it arises in a context of a crisis of the legitimacy of representative democracy (lack of satisfaction and credibility of the citizens with respect to their representatives) and (ii) it takes advantage of the potential of ICT to bring about a change to a model that is in keeping with the information and knowledge society (Moreno-Jiménez and Velázquez, 2011).

The following section presents the evolution and development of the term e-Participation over time.

### **3.2.2 Evolution of e-Participation**

Verba et al. (1995) define e-Participation as any voluntary activity of citizens addressed to influencing the selection of their rulers or in the taking of public decisions that are channeled or produced through electronic or telematic means. This definition only takes participation from below into account, in other words, only that initiated by the citizens and not by the governments. Moreover, it would correspond to the maximum level of participation because there are other levels that suppose less citizen involvement and a lower direct impact on elections or on political decisions. These include information and communication, which are levels necessary to produce participation at the higher level.

According to the OECD (OECD 2001) “*active participation is defined as a relationship based on partnership with government in which citizens actively engage in defining the process and content of policy-making. It acknowledges equal standing for citizens in setting the agenda, proposing policy options and shaping the policy dialogue – although the responsibility for the final decision or policy formulation rests with government*”.

Hiller and Bélanger (2001) associate e-Participation with the last of the five levels that they consider when talking about Electronic Government<sup>22</sup>: political e-Participation. This level promotes the establishment of the necessary mechanisms for carrying out online voting, public forums and opinion polls. Ekelin sees electronic participation as a potential use of communication tools to transform the relations between citizens and rulers and, thus, achieve an evolution of the classic model of democracy (Ekelin, 2006).

The emergence of the concept of e-Participation as a process that enables and supports democratic initiatives is an evolution of many related communication services that are influenced by the rapid growth and acceptance of the Internet (Sanford and Rose, 2007).

In spite of these different definitions of the term e-Participation, all of them highlight the enormous potential of ICT in its development. In particular, they facilitate debate and discussion about important questions of common interest (Jaeger, 2005) and they allow the improvement of governmental policies by way of the connection of citizens among themselves and with their representatives through public deliberation (Macintosh, 2004).

E-Participation represents the widening, transformation and greater intervention of citizens in public life and in consultation processes (Robbins et al., 2008), increasing transparency, improving accountability and limiting the extent of arbitrariness in decisions and abuses of power (Osimo, 2008). Both David Osino and Laporte et al. (2002) outline the possibility of a direct relation between e-Participation and transparency, something that, in our view, is not sufficiently proven.

E-Participation can certainly be used to establish early warning systems to advise about or to prevent falsehood or error in the data offered by the Administration when it provides information on the evaluation of its actions. It can also serve to demand greater accountability but, in no case, by itself, does it improve accountability or the capacity for accountability. The process of accountability should be tackled systematically by the

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<sup>22</sup> Electronic Government understood as the application of ICT in the Public Administration combined with organizational changes and new skills to improve public services and democratic processes as well as to strengthen support for public policies (Layne and Lee, 2001).

Administration itself because it has the necessary information to evaluate the behavior of the public system in all its areas (efficiency, efficacy and effectiveness) and, moreover, it has the power to demand and to provide it.

Citizen participation can only put pressure on the legislative power to carry out the relevant legal reforms to oblige the Administration to provide systematic accountability. Unfortunately, this idea of giving back the control of the democratic system to the citizen, as occurred in Ancient Greece, is not one that is followed by the majority of the political class, even though it is clearly a necessity to improve the quality of democracy.

Summing up, in spite of the importance of the process of e-Participation in public administrations, research in this field has shown its immaturity and heterogeneity (Sæbø et al., 2008). Furthermore, it is necessary to take into account the problems related to the different barriers and restrictions that citizens face to access ICT, the so-called digital gap, which means that participation is not complete, and the different strategies implemented by governments to encourage this participation (Julnes and Johnson, 2011).

In short, the results of the relation between the Internet and democratic participation will depend on the forms of democratic participation that are promoted through the Internet (Barber, 1998). For the term electronic participation to become consolidated, it is still necessary, as Barber suggested, to link efforts and theories that allow the application of common methods. In this way, together with the application of the tools of e-Participation, it will be possible to respond to social demands in a dynamic and global environment. This, in turn, will allow the improvement of democracy and the formal political process through an efficient communication between citizens, politicians, civil servants and the other actors involved.

### **3.2.3 Objectives of e-Participation**

The overarching objectives of e-Participation are given as (OECD, 2003):

1. Reach a wider audience to enable broader participation
2. Support participation through a range of technologies to cater for the diverse technical and communicative skills of citizens

3. Provide relevant information in a format that is both more accessible and more understandable to the target audience to enable more informed contributions
4. Engage with a wider audience to enable deeper contributions and support deliberative debate

Apart from these specific objectives that are related to previous proposals that sought a new democracy, e-Participation may be one of the possible solutions to counteract the increasing antipathy towards formal politics.

### **3.2.4 Principles of e-Participation**

OECD (2009) emphasizes ten guiding principles to be applied as cross-cutting issues for the successful implementation of e-Participation activities. These are:

- 1) *Commitment*: Demonstration of leadership.
- 2) *Rights*: Demonstration of how government institutions meet their obligation to secure citizens' right to access information, be consulted and participate in policy making.
- 3) *Clarity*: Demonstration of clarity of objectives and citizens' roles at each phase from the very outset of the e-Participation process.
- 4) *Time*: Demonstration of sufficient time allotted at each phase as early as possible to ensure that all possible policy options are considered.
- 5) *Evaluation*: Demonstration of the assessment mechanism deployed by authorities to evaluate their performance at each phase of participation.
- 6) *Objectivity*: Demonstration of the objective nature of information provided, its completeness and accessibility to all willing to participate in policy making.
- 7) *Resources*: Demonstration of the provision of adequate and accessible resources – technical, financial, human – needed to conduct participatory activities at every stage.
- 8) *Co-ordination*: Demonstration of effective inter-agency co-ordination activities across the government to exclude duplication of effort; prevent 'participation fatigue' on the citizens' part.

9) *Accountability*: Demonstration of the effective, responsible and transparent use by the government of citizens' feedback and other participation activities for policy making as part of broader accountability mechanisms.

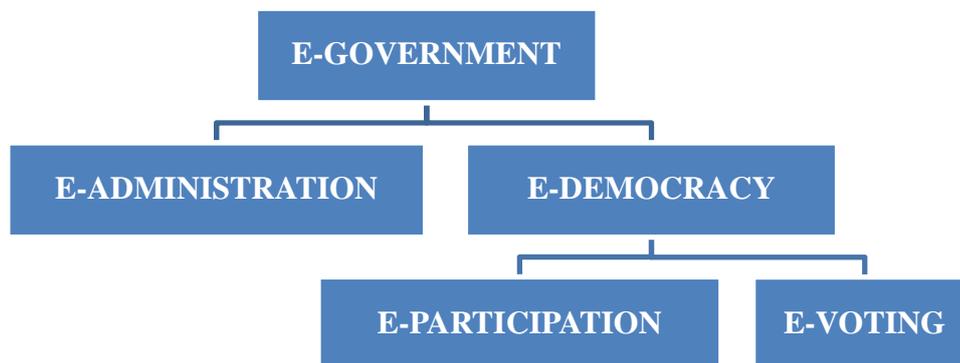
10) *Active citizenship*: Demonstration of efforts aimed at encouraging civic activism by increasing capacities and skills of the citizenry to participate in policy making in a meaningful and informed manner.

### **3.2.5 Delimitation of dimensions**

*E-Participation is a complex area of applying ICT in the context of citizen engagement in the discourse with politicians and governments. To properly understand the field, one has to bring together research and development from a variety of disciplines. Apart from that, e-Participation is not a single and simple case of application. Further on, e-Participation may engage people with varying levels of engagement, and in different stages of the policy (Wimmer, 2007).*

As was mentioned in Chapter 1 (Section 1.7.2), the literature on e-Government (Bertelsmann Foundation, 2002; Chadwick and May, 2003) identifies two dimensions in which the Internet plays a fundamental role in the reform processes of the Administration: economic or the delivery of services (e-administration) and civic or of democratic participation (e-democracy). E-democracy, in turn, is classified into e-Participation and e-Voting, known as the electronic vote (see Figure 3.1.).

**Figure 3.1.** E-Government contexts at the beginning of the 2000s



Four dimensions explain the scope of e-Participation: (1) Participation areas; (2) Stages in policy making; (3) Level of Engagement and (4) Stakeholders involved. These

are explained in more detail in the following section. Figure 3.2 contains the scope of e-Participation in a four-dimensional work (DEMO-net D51, 2006; Wimmer, 2007):

**Figure 3.2.**Scope of e-Participation



Source: Wimmer, 2007

### 3.2.5.1 Participation Areas

Participation areas are divided into the following (Wimmer, 2007):

- *Information Provision:* ICT to structure, represent and manage information in participation contexts.

- *Community building/Collaborative Environments*: ICT to encourage individuals to come together to form communities, to develop shared agendas and to shape and empower these communities.
- *Consultation*: ICT in official initiatives by public or private agencies to allow stakeholders to contribute their opinion, either privately or publicly, on specific issues.
- *Campaigning*: ICT in protest, lobbying, petitioning and other forms of collective action (except for election campaigns, see electioneering as a participation area).
- *Electioneering*: ICT to support politicians, political parties and lobbyists in the context of election campaigns.
- *Deliberation*: ICT to support virtual, small- and large-group discussions, allowing reflection and consideration of issues.
- *Discourse*: ICT to support the analysis and representation of discourse.
- *Mediation*: ICT to resolve disputes or conflicts in an online context.
- *Participatory Budgeting*: ICT to assign a public budget through deliberation and decision-making.
- *Spatial planning*: ICT in urban planning and environmental assessment.
- *Polling*: ICT to measure public opinion and sentiment.
- *Voting*: ICT in the context of public voting in elections, referenda or local plebiscites.

### **3.2.5.2 Stages in policy-making**

This dimension reflects a structure of high level stages in policy-making. The stages defined by Howlett and Ramesh (1995) are:

1. *Agenda setting*: refers to the process by which problems come to the attention of governments.
2. *Policy formulation*: refers to the process by which policy options are formulated within governments.

### Chapter 3: Effectiveness of e-Cognocracy

3. *Decision making*: refers to the process by which governments adopt a particular course of action or non-action.
4. *Policy implementation*: refers to the process by which governments put policies into effect.
5. *Policy evaluation*: refers to processes by which the results of policies are monitored by both state and societal actors, the result of which may be the re-conceptualization of policy problems and solutions.

A slightly different approach has been developed by Macintosh et al. in an OECD study. These authors distinguish the following five high-level policy stages (Macintosh, 2004):

1. *Agenda setting*: establishing the need for a policy or a change in policy and defining what the problem to be addressed is.
2. *Analysis*: defining the challenges and opportunities associated with an agenda item more clearly in order to produce a draft policy document. This can include: gathering evidence and knowledge from a range of sources including citizens and civil society organizations; understanding the context, including the political context for the agenda item; developing a range of options.
3. *Formulating the policy*: ensuring a good workable policy document. This involves a variety of mechanisms which can include: formal consultation, risk analysis, undertaking pilot studies, and designing the implementation plan.
4. *Implementing the policy*: this can involve the development of legislation, regulation, guidance, and a delivery plan.
5. *Monitoring the policy*: this can involve the evaluation and review of the policy in action, research evidence and views of users. Here there is the possibility to loop back to stage one.

Chapter 2 of this thesis (Section 2.6.6.2) describes the stages suggested for e-Cognocracy. As can be appreciated, the methodology followed in this model of cognitive democracy substantially modifies the stages included in the previous proposals, which basically reflect the steps of the traditional scientific method. Comparing the stages of e-Cognocracy with the proposals of Wimmer (2007), it can be

highlighted that e-Cognocracy incorporates new stages, such as the second round of voting (included to evaluate the individual and collective learning) and the intermediate stage for discussion (included to extract the arguments that support the decisions). A final stage has also been incorporated that is dedicated to the integral evaluation of the process of participation. This stage will evaluate the three areas considered when analyzing the behavior of systems: effectiveness, efficacy and efficiency (Moreno-Jiménez, 2006; Moreno-Jiménez, Pérez Espés and Wimmer, 2013).

This new form of addressing the scientific resolution of problems is not limited to obtaining the best solution (Product) or even to attaining greater knowledge of the process followed in the resolution (Process); it focuses on the “P” of Person: reiteration in the resolution of occasional problems helps broaden our capacity for resolving future new and complex situations characterized by the existence of multiple scenarios, actors and criteria (Moreno-Jiménez, 2002):

### **3.2.5.3 Level of engagement**

As was mentioned in Chapter 2 in Section 2.6.6.3, the level of participation has been discussed in the literature in different classification schemes. This section presents the classifications of several authors:

An OECD study identifies three levels of participation: (i) *e-Information*: provision of information on the Internet, (ii) *e-Consultation*: organizing public consultations online, and (iii) *e-Decision-making*: involving citizens directly in decision processes (OECD 2001). This direct involvement in e-decision making is only in a deliberative sense, looking for “informed” decision making.

According to Macintosh, there are three different levels of e-Participation: *e-enabling*, *e-engaging* and *e-empowering* (Macintosh 2004).

The first level is the use of technology to enable participation. *E-enabling* is about supporting those who would not typically access the internet and make the most of the information available there by addressing the accessibility and understandability of the information.

The second level is the use of technology to engage with citizens. *E-engaging* with citizens is concerned with consulting a wider audience to enable deeper

contributions and support deliberative debate on policy issues. The use of the term ‘to engage’ in this context refers to the top-down consultation of citizens by government or parliament.

Finally, the third level is the use of technology to empower citizens. *E-empowering* citizens is concerned with supporting active participation and facilitating bottom-up ideas to influence the political agenda. The previous top-down perspectives of democracy are categorized in terms of user access to information and reaction to government-led initiatives. From the bottom-up perspective, citizens are becoming producers rather than just consumers of policy (Macintosh et al., 2002). *Here there is recognition that there is a need to allow citizens to influence and participate in policy formulation* (Macintosh 2004). This concept is more concerned with active two-way participation as is mentioned by OECD (Wimmer, 2007).

A study by the International Association for Public Participation (IAP2) provided five levels of traditional participation with increasing levels of public impact (quoted by Wimmer, 2007): Inform, Consult, Involve, Collaborate and Empower<sup>23</sup>. *Inform* aims to provide the public balanced and neutral information to assist them in understanding the problem, alternatives, chances and/or solutions. *Consult* is to get public feedback on analysis, alternatives and/or decisions. *Involve* is about working directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood. *Collaborate* is to work with the public in each aspect of the decision, including the development of alternatives and the identification of the preferred solution. And finally, *Empower* is to place final decision-making in the hands of the public.

This “place in the hands of the public” is not clearly explained. In general, this concept can vary from direct democracy (citizens make decisions) to informed decision making (citizens inform the decisions made by the representatives). In the proposal of Wimmer (2007), empower refers to binding referendum processes.

These schemas introduced in the literature do not consider the fact that a lot of information flow is initiated by citizens and NGOs towards government. A typical one-

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<sup>23</sup> <http://www.iap2.org/associations/4748/files/spectrum.pdf>

way relationship initiated by the citizen is an e-petition. In consequence, a slightly modified schema is proposed in DEMO-net, which merges the above schemas into four levels of engagement in e-Participation (Wimmer, 2007):

- *eInforming* refers to a one-way channel that provides information from either government, such as official websites, or citizens, such as ePetitions.
- *eConsulting* is a limited two-way channel where official initiatives by public or private agencies allow stakeholders to contribute their opinion, either privately or publicly, on specific issues.
- *eCollaborating* is a more enhanced two-way channel. It acknowledges an active role for all stakeholders in proposing and shaping policy - although the responsibility for the final decision rests with officials.
- *eEmpowering* refers to the placement of the final decision in the hands of the public, e.g., legally-binding referenda.

This last level does not include co-decision or cognition.

#### **3.2.5.4 Stakeholders involved**

The analytical framework (Figure 3.2) also studies the actors or stakeholders of certain participation areas. These are specifically distinguished with respect to ICT-enabled participation areas. Furthermore, two types of stakeholders are considered: i) actors that benefit from using a certain participation tool and ii) those that are responsible for or moderating/administering the participation tool. Possible stakeholders in participation experiences will typically include elected representatives, government ministers, government employees responsible for implementing policy, policy-makers, civil society organizations (CSOs), businesses, and individual citizens. Besides, both the government and the actors involved may call on multi-disciplinary teams of experts to support the process (Wimmer, 2007).

### **3.3 RELATIONSHIP BETWEEN E-PARTICIPATION AND E-COGNOCRACY**

The breadth of the term “to participate” and the relative youthfulness of the neologism e-Participation continue to provoke numerous and very varied interpretations of its meaning. Focusing on the two basic concepts that compose this neologism, and understanding by “participation” actively taking part in something and by “electronic” the use of the Internet as a communications support, the literal interpretation of e-Participation would be associated with the application of communications technology (the Internet) in any participative process.

Within the framework of this thesis, e-Participation can be applied, in general, to two spheres contemplated in Public Administration (Moreno-Jiménez, 2009): (i) service delivery (e-Administration) and (ii) political participation in democratic processes (e-Governance). Nevertheless, traditionally, e-Participation has been associated exclusively with the second of the two: political participation or e-Governance in its widest sense (participation in public decision making with respect to the government of society).

With this interpretation of e-Participation, e-Cognocracy can be considered to be a new model of participation and, thus, included within it because its objective is collaborative public decision making.

On the other hand, and in spite of the similarities between the two concepts, the philosophical, methodological and technological support on which e-Cognocracy is based is notably different to that contemplated for e-Participation up to the beginning of 2003. At that time, political participation was limited to citizen debate and discussion about decisions that, finally, were still taken by their political representatives. The participation of citizens was confined to informing political decisions, but they had no guarantee that this would have any influence on the final result or decision.

From a philosophical point of view, e-Cognocracy is based on the evolutionism of living beings, in particular, on their vital process (cognitive process), and seeks to improve society through the continuous education of its members in a key aspect of humans: decision making.

From a methodological point of view, e-Cognocracy allows the incorporation into the formal model used (through multi-criteria decision techniques) of both tangible aspects, associated with the objective information provided by the Administration and the other actors, and subjective aspects, which refer to the different visions of reality of the actors involved in the resolution of the problem. Multi-criteria decision techniques provide the scientific rigor required for resolution procedure followed, from the setting and formulation of the problem to the implementation of the solution and the evaluation of the approach used. These techniques allow working with multiple scenarios, actors and criteria (tangible and intangible) and, unlike other approaches followed in public choice, permit the capture of the intensities of preferences in a cardinal sense (not the ordinal traditionally used).

From a technological point of view, the use of information technologies to extract behavior patterns from large databases (*data mining*) or texts (*text mining*) and of communications technologies to facilitate interconnection and interaction between all the actors involved in the resolution of the problem permit a collaborative resolution that is in line with the philosophy underlying the Knowledge Society.

From an operational point of view, e-Cognocracy combines, by means of weights that depend on the type of problem (local, regional, national or supranational), representative (politicians) and direct (citizens) democracy. In this way, the limitations that both present when considered individually are overcome.

At each of the stages contemplated in its methodology, advantage is taken, through the use of ITC, of the creative potential of all those interested in the resolution of the problem. It includes tangible and intangible aspects in the resolution process and incorporates intensities in the preferences. It permits co-decision between citizens and representatives and, finally, through techniques of *data* and *text mining*, extracts and diffuses the arguments that support the opinions and the decisions. In this way, it educates individuals and society in general in a key aspect for the latter: scientific decision making (Moreno-Jiménez et al., 2015).

### **3.4 EVALUATION OF E-PARTICIPATION EXPERIENCES<sup>24</sup>**

This section explores the background to the evaluation of e-Participation experiences in two contexts - the Information Society and the Knowledge Society. It considers the different approaches followed in the scientific literature on the evaluation of e-Participation experiences. Firstly, it examines the more traditional techniques that focus on the informational aspect (efficiency and efficacy) of accountability and transparency of websites and tools (Information Society) and then looks at the EF3-approach (effectiveness, efficacy and efficiency), proposed for the evaluation of e-Participation initiatives in the Knowledge Society.

#### **3.4.1 E-Participation experiences in the information society**

The evaluation of e-Participation processes is an issue of relatively recent interest since it is only in the last ten years or so that real-life contrastable e-Participation experiences have been implemented and documented and a variety of evaluation theories and concepts have been developed (Rogers, 2003; Venkatesh et al 2003). In 2006, the European Commission (EC) launched the 'e-Participation Preparatory Action' to spur innovation and to support pilot projects showing how the deployment of ICT may simplify the participation of people in decision-making and legislation formation processes.

According to Aichholzer and Westholm (2009), evaluation should generate information on the results of an e-Participation project and its process organisation. Whether the focus is on outcomes (summative evaluation) or on process aspects (formative evaluation), both involve a systematic comparison with predefined criteria, performance standards or expectations. Motivations for evaluating e-Participation projects can be quite varied. Organisational learning, management enhancement, audit, project control, assessment of tools and the enhancement of democracy are among the most important interests.

At the end of the 1980s, Bagozzi and Warshaw (1992), proposed a secure and stable technology model for predicting the users' acceptance of a range of new technologies that has been widely employed and studied in recent decades. Fred Davis

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<sup>24</sup> Section extracted from the chapter of the book: Moreno-Jiménez, Pérez Espés and Wimmer, 2013

(Davis, 1989) suggested a technology acceptance model (TAM) that explains the process of acceptance of information technology at an individual level. The Davis model is probably the most recognised and utilised in the scientific literature, it is commonly referenced and has been the inspiration behind a number of other, similar, models.

Delone and MacLean (1992) designed the “Information System Success” model as a conceptual framework for measuring the complex dependent variable in research on information technology systems. Ten years later, the same authors updated the original model based on changes in the management of information systems (Delone and MacLean, 2003).

Rowe and Frewer (2000) proposed a framework to evaluate participation in general (not specific to e-Participation). These authors specified a number of theoretical criteria which are essential for effective public participation and divided them into two types: acceptance criteria and process criteria. Acceptance criteria, that is to say, representativeness, independence, early involvement, influence, and transparency, offer a measure of acceptability by the wider public, while process criteria, namely, resource accessibility, task definition, structured decision making, and cost-effectiveness, offer a measure of effectiveness.

Published studies on the evaluation of e-Participation applications are very small in number and, so far, only a few embryonic evaluation frameworks have been put forward (Whyte and Macintosh, 2003, Frewer and Rowe, 2005). Anttirioko (2003) suggests that the evaluation of e-democracy should include the broad capability of technology to add value and this should be articulated through the parameters of institutions, influence, integration and interaction. Whyte and Macintosh (2003) argue that, to evaluate how effective e-Participation is in engaging a wide audience and, thereby, informing and influencing the policy process, the analytical framework has to consider three dimensions: the evaluation criteria, the analysis methods available and the actors involved. The evaluation criteria should consider three, overlapping, perspectives: democratic, project and socio-technical. These authors believe that any generalised evaluation framework for e-Participation needs to clearly define the evaluation criteria that are being considered and the actors involved. It must also ensure

that relevant research methods are matched to the appropriate actor with regards to timing, skills and the willingness to be involved. Henderson and Henderson (2005) proposed a framework for evaluating on-line consultations, e-petitions and an Internet live broadcasting parliamentary initiative. This framework was made up of 7 evaluation dimensions and indicators: Effectiveness; Equity; Quality; Efficiency; Appropriateness; Sustainability; Process.

Since the European Commission launched the 'e-Participation Preparatory Action' in 2006, a number of evaluation methods have been proposed (Macintosh and Whyte 2008; Aichholzer and Westholm 2009; Luna-Reyes et al., 2012; Wimmer and Bicking, 2013) for the evaluation of transparency, participation, efficiency and efficacy; most of them are focused on the evaluation of the tools and technologies of e-Participation experiences and only a few have analysed policy making and policy support.

While the evaluation of e-Participation in the Information Society has concentrated on (Aichholzer and Westholm, 2009) Products (efficiency) and Processes (efficacy), the evaluation of e-Participation in the Knowledge Society should deal with the third and most important 'P' of the '3P' perspective (Moreno-Jiménez, 2002): People (effectiveness).

### **3.4.2 E-Participation experiences in the knowledge society**

In the KS, ICT developments make it possible to assess the impact of people on e-governance and the impact of experiences of e-Participation on the people. This allows greater political transparency and accountability and more citizen control and participation. When public funds are used in an activity, evaluation is desirable as a means for improving the system. In general, the evaluation of e-Participation is indispensable if knowledge of greater precision and objectivity on the effectiveness, the value or the success of an e-Participation project, initiative or program is required (Aichholzer and Westholm, 2009). When evaluating e-Participation experiences, the objectives and goals of the experience must be taken into account. The objectives can be considered from the differing points of view associated with the actors involved in the resolution of the problem: the Public Administration; the politicians, the citizens, etc.

The first e-Participation experiences were aimed at analysing the extent to which the methodology (decisional tools) and the technologies (information and communication support) were user-friendly, in other words, to determine if the products were efficient. Once the products' efficiency was evaluated, the next step was to look at the efficacy of the processes. The third and final step in the evaluation of an e-Participation experience is the analysis of its effectiveness: the public valued added to society as a whole. This last question is very complex and there are almost no published works to date. The evaluation of effectiveness must be based on the mission of democratic models in every period of history.

Effectiveness (doing what is right) can be understood (García Lizana and Moreno-Jiménez, 2008) as the identification of the aspects relevant to the problem and the setting of appropriate goals for resolving it. In this case, it involves the complete development of the capacity for working with a plural, coherent, hierarchical teleological system as a support to political action and this implies (García Lizana and Moreno-Jiménez, 2008): a) the setting of aims of the highest order (subsistence, equity, liberty, knowledge, participation etc.) for the achievement of which, in the final analysis, the democratic system was designed; b) the identification of the relevant operational objectives associated with the aforementioned aims; c) the setting of precise levels (goals) for the objectives that must be achieved. Efficacy is defined as achieving the goals that are fixed by means of setting the objectives (achieving goals). And finally, efficiency is achieved through the best possible assignation of public resources (doing things correctly) (Moreno-Jiménez 1997; 2006).

The three concepts *effectiveness, efficacy and efficiency* (EF3-Approach) have been utilised when evaluating an e-Participation experience (Moreno-Jiménez 2006, 2009; Mamaqui and Moreno-Jimenez, 2009; Moreno-Jiménez, Pérez Espés and Wimmer, 2013; Pérez-Espés et al., 2014). The next section presents the evaluation of e-Cognocracy.

### **3.5 EVALUATION OF E-COGNOCRACY**

#### **3.5.1 EF3-approach**

In April 2010, Moreno-Jiménez proposed the EF3-approach which contemplates the following ideas:

- a) Effectiveness, which is associated with strategic planning or long-term behaviour and which investigates aspects relevant to the resolution of a problem (doing what is right);
- b) Efficacy, which is associated with tactical planning or medium-term behaviour and is related to measuring how well the goals that are set, are achieved;
- c) Efficiency, which is associated with operational planning or short-term behaviour and measures the best possible allocation of public resources (doing things correctly).

Moreno-Jiménez argues that these three criteria are commonly used when evaluating the behaviour of enterprises: strategic, tactical and operational planning (Moreno-Jiménez, 2006).

#### **3.5.2 Background**

One of the ideas most accepted by both researchers and administrators and users of electronic public services is that the adoption of these services depends, to a great extent, on the benefits perceived by the citizens.

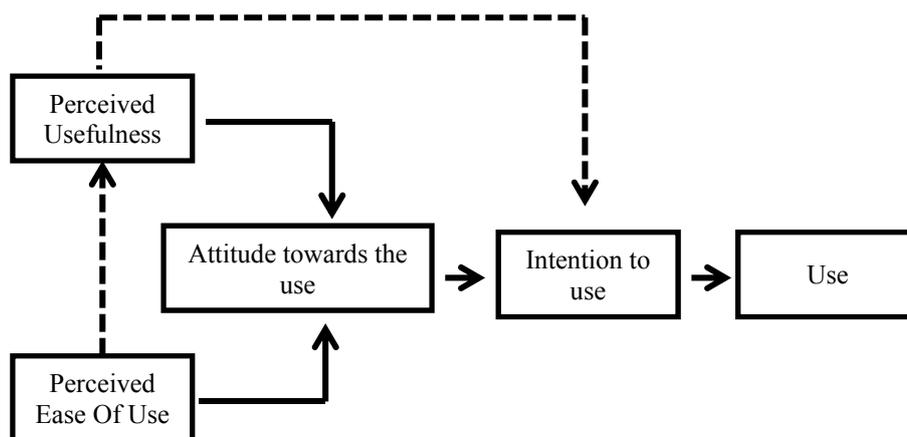
To foment the use of electronic public services by citizens, Public Administrations need to know the key aspects that foster their adoption. Given that the online delivery of public services is based on the use of technology, the variables and models of technological adoption have acquired a fundamental role beyond the factors traditionally employed in the previous literature on adoption (Al-Adawi et al. 2005). These authors proposed a model that follows the TAM and explains intentions to use e-Government websites by postulating four direct determinants: perceived usefulness, perceived ease of use, trust, and perceived risk. The TAM offers promising theoretical bases for examining the factors contributing to the acceptance of new technologies and has been successfully applied in customer behaviour, technology acceptance and system use, and a variety of instances of human behaviour.

As was mentioned previously, at the end of the 1980s, Bagozzi and Warshaw (1992) proposed a secure and stable technology model for predicting the users' acceptance of a range of new technologies that has been widely employed and studied recently. In 1986, in his doctoral thesis, Fred Davis (Davis, 1989; Davis et al., 1989) suggested a technology acceptance model (TAM) that explains the process of acceptance of information technology at an individual level. It is in line with the tradition of previous research into information systems (Swanson, 1974; Schultz and Slevin, 1975; Zmud, 1978) that seek to identify the attributes that lead to the success of information systems in business, taking user satisfaction as its measure.

The TAM is based on the Theory of Reasoned Action (TRA) (Ajzen and Fishbein, 1980) and on its methodology of expected values. The authors of the model had already used the TRA in their research. Bagozzi (1981) did so in a work on blood donation, Warshaw and Davis (1984) for a variety of activities and Warshaw (1980) in brand selection.

The TAM permits evaluation measurements of the quality of information technology systems and their adjustment to the requirements to the tasks that are to be executed; it is therefore used to predict the level of acceptance and use of new technologies. The model assumes that attitudes toward the use of an information system are based on two antecedent variables: i) Perceived usefulness (PU) and ii) Perceived ease-of-use (PEOU). Figure 3.3 represents the Davis TAM model:

**Figure 3.3.** Basic TAM model (Adapted from Davis 1989)



Source: Davis, 1989

### Chapter 3: Effectiveness of e-Cognocracy

This is similar to Bandura's (1982) concept of *self-efficacy*. Perceived usefulness is defined as "*the degree to which a person believes that using a particular system would enhance his or her job performance*" (Davis, 1989). The items employed by Davis (1989) as indicators of perceived usefulness are aimed at knowing people's evaluations of the consequences that the use of a determined information system may have on their productivity at work.

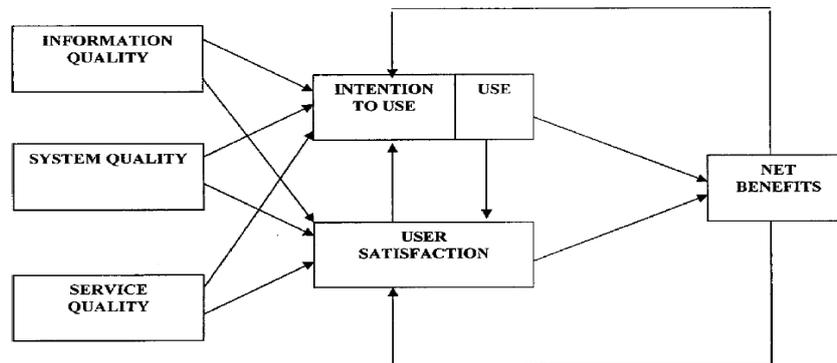
Another of the fundamental constructs of the TAM is *the perceived ease of use* of a technology, which is based on the *self-efficacy* of Bandura (1982) and is defined by Davis (1989) as "*the degree to which a person believes that using a particular system would be free from effort*". The items that measure this concept are flexibility, ease of use, control and the simplicity of becoming an expert in its use.

In the TAM, a direct link is proposed between *beliefs (perceived usefulness)* and *intentions*. This is a significant difference with respect to the Theory of Reasoned Action (Ajzen and Fishbein, 1980), where beliefs only have an impact on attitudes.

In 1992, DeLone and McLean developed an Information System Success Model, based on research on communications carried out by Shannon and Weaver (1949), in which they determined two quality dimensions: *System quality*, that measures technological success, and *Information quality*, that measures semantic success (the content). The model was based on an analysis of the literature from 1980 to 1990, consisting of around 100 publications. The original model was applied and its results published in more than 300 papers, which guarantees the applicability of the model.

They later updated this model in 2003 to include three dimensions of quality that affect use and user satisfaction: *Information quality*, *System quality*, and *Service quality* that measures the quality of service delivery. In the updated model, "Intention to use" refers to attitude; "Use" refers to behaviour (see Figure 3.4).

**Figure 3.4.** The DeLone and McLean model (DeLone and McLean, 2003)



**Source:** DeLone and McLean, 2003

Based on these two models, we presented a new approach called the *theoretical EF3-framework* to deal with the evaluation of e-Cognocracy (Moreno-Jiménez, Pérez Espés and Rivera, 2013).

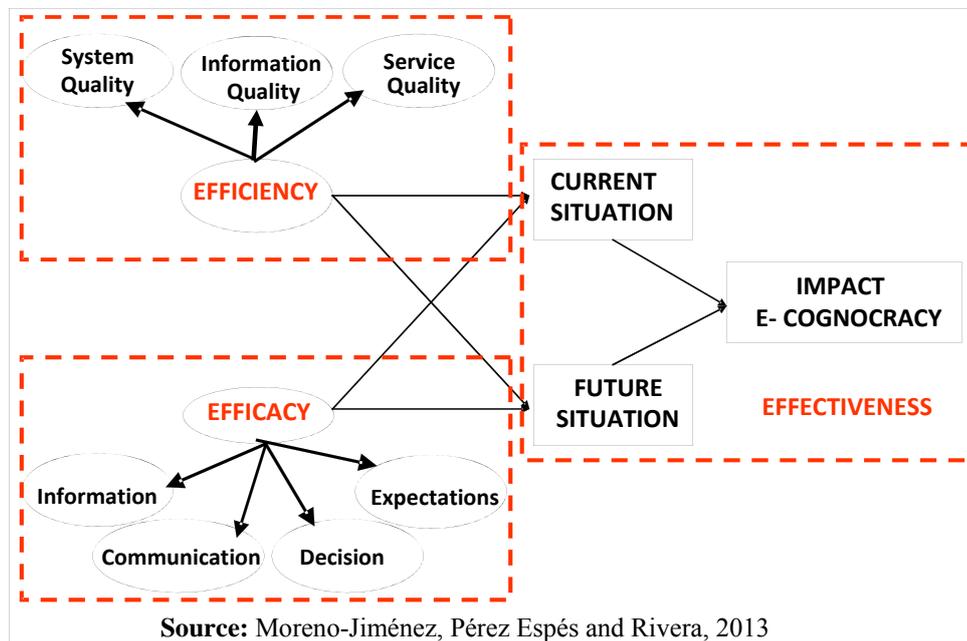
### 3.5.3 The theoretical EF3-framework

This section presents a theoretical framework based on the EF3-approach and the TAM and DeLone and McLean models for the evaluation of e-Cognocracy. This framework will allow the simultaneous evaluation of the model's efficiency (short-term behaviour - operational planning), efficacy (medium-term behaviour – tactical planning) and effectiveness (long-term behaviour – strategic planning).

The theoretical EF3-framework proposed for the integration of effectiveness, efficacy and efficiency can be considered an extension of the TAM and DeLone and McLean approaches: the perceptions and behaviour of citizens are used to evaluate the processes of citizen participation and the adoption of technology. This theoretical framework was developed for the evaluation of e-Cognocracy.

Figure 3.5 shows the theoretical EF<sup>3</sup>-framework which identifies relevant aspects required for evaluating e-Cognocracy.

**Figure 3.5.** Theoretical EF3-framework for the evaluation of e-Cognocracy



In the context of the theoretical EF3-framework proposed, the aforementioned concepts were understood as follows: efficiency is “the operational improvement of the current democratic system”; efficacy is the capacity of the current democratic system to “defend the interests of the citizens through their representatives”; effectiveness is “the conjoint creation of a better society” (Moreno-Jiménez, Pérez Espés and Wimmer, 2013).

The relevant aspects determining efficiency are based on the three constructs contemplated by the model of DeLone and McLean (2003): the IT application (*system quality*), the information that is obtained (*information quality*) and the human resources support (*service quality*).

Four constructs are considered for the evaluation of efficacy: *information*, *communication*, *decision* and *expectations*. *Information* can be considered as a unidirectional flow of interaction (usually from the administration to the citizens). *Communication* is understood as two-way interaction: debate and discussion. In addition to the bi-directional flow of information, *Decision* includes the production of a co-decision between the administration and citizens. Finally, *expectations* refer to the identification of the characteristics that participation experiences should have in the future.

Effectiveness is studied through the analysis of two scenarios as latent intermediate variables: the *current situation* and the ideal (*future situation*), and an endogenous variable that captures the idea of the creation of a better society (*impact of e-Cognocracy*).

The following section presents the evaluation of the theoretical EF3-framework through a survey implemented in the real-life experience of Cadrete (based on e-Cognocracy) using SEM or the Covariance Structure Analysis approach (Bollen, 1989; Bollen and Lennox, 1991; Jöreskog and Sörbom, 1996 and Bentler, 1995-2006).

### **3.6 CASE OF STUDY: REAL-LIFE EXPERIENCE IN CADRETE**

#### **3.6.1 Description<sup>25 26</sup>**

This e-Participation initiative is third electronic consultation carried out at local level in Aragón and took place in the municipality of Cadrete (Zaragoza) by the Zaragoza Multicriteria Decision Making Group (<http://gdmz.unizar.es>) during April 2010.

The consultation focused on the design of municipal public policies for culture and sports. Its aim was twofold:

- (i) That the decision concerning the distribution of the budgetary provision allocated to cultural and sports activities in the town should be taken conjointly between the politicians and the citizens
- (ii) To foment debate and the involvement of citizens in the taking of public decisions: in particular, to make the arguments that supported the decisions taken available publicly.

To foster citizen participation, it was thought convenient to incorporate a new group of actors, residents' associations, whose mission would be to encourage citizen participation. Thus, three groups of decision makers were considered with different

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<sup>25</sup> Section extracted from paper: Moreno-Jiménez and Velázquez, 2011 (translated)

<sup>26</sup> All information regarding the project carried out in Cadrete is contained on the website: <https://participa.cadrete.es>.

weights: (i) *politicians*, that is, the public representatives, with a final weight of 40%; (ii) *citizens* with a weight of 44% and (iii) *associations* located in the municipality, with a weight of 16%.

The voting possibilities offered to the citizens were the following:

- Voting with an electronic ID
- Voting with user name and password

These options were available to registered residents of the municipality that were over 18 through remote e-voting using personal computers connected to the Internet or through in-person e-voting using computers prepared for this purpose by the Council at the library and the town’s cyberspace. To exercise their right to vote electronically, the citizens, politicians and associations had to register in the citizen participation census set up in the Town Hall during two weeks and until two days before the first vote.

The census of actors that fulfill the requirements necessary to participate and the weights awarded to each group are shown in Table 3.1.

**Table 3.1.** Voters and weight awarded

<b>Participants</b>	<b>Census</b>	<b>Weight</b>
<b>Citizens</b>	1,949[*]	44
<b>Politicians</b>	11	40
<b>Associations</b>	15	16
<b>Total</b>	1,975	100

**Source:** Moreno-Jiménez and Velázquez, 2011

\* Over 18s with the right to vote in 2008, according to data from the Instituto Aragonés de Estadística (IAEST)

The voters could determine what proportion of economic and financial resources should be allocated to each of the four segments of the population considered: children (0-14 years old), the young (15-29 years old), adults (30-64 years old) and the elderly (over 65 years old). To do so, a hierarchy with two criteria, Cultural and Sports, and six sub-criteria was constructed. Within the criterion associated with cultural aspects, three sub-criteria could be selected, Education, Leisure and Identity, and, within the sports criterion, the sub-criteria of Entertainment, Physical Development and Social Relations could be selected.

### **3.6.1.1 Phases of the process**

The process of participation consisted of the following phases, which correspond to the basic structure of the model of democracy known as e-Cognocracy (Moreno-Jiménez, 2003a, 2004, 2006; Moreno-Jiménez and Polasek, 2003, 2004, 2005):

1st. *Problem formulation.*

2nd. *Information and training.*

3rd. *Modelling* the problem following the methodological proposal of one of the most widespread multicriteria techniques, the Analytic Hierarchy Process (Saaty, 1980).

4th. *First round of voting.* Those inscribed in the citizen participation census could vote on their preferences (cultural or sports) from 13 hours to 24 hours on the 8th April, 2010.

5th. *Discussion.* From the 8th to the 16th of April, a forum was opened on the Internet to foster debate. All those who so wished, even if they had not logged in for the voting process, could freely express their opinions, proposals, suggestions and ideas, as well as to respond to the comments of the other citizens.

6th. *Second round of voting.* As in the first vote, those inscribed in the citizen participation census could vote electronically on their preferences (cultural or sports) from 12 hours to 19 hours on the 16th April, 2010.

7th. *Presentation of the results* and closing ceremony. This took place on the 23rd of April, 2010, terminating the participative process and making known the results obtained; a raffle for gifts was held among the voters.

At the end of the consultation, the participants were invited to fill in a questionnaire about the experience in which, fundamentally, the effectiveness of e-Cognocracy was analyzed.

### **3.6.1.2 Methodology**

The methodological support used in this voting experiment is based on the Analytic Hierarchy Process (AHP), a multicriteria technique proposed by T.L. Saaty

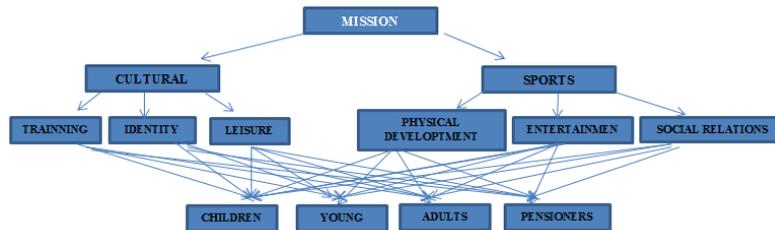
(1980). First, a hierarchy is constructed (Figure 3.6.) that contains the relevant aspects of the problem considered. Then, the individuals incorporate their preferences by means of the pair-wise ranking of the elements considered, following the fundamental scale of Saaty (Table 3.2.). Finally, the methodology aggregates the values throughout the hierarchy to obtain the preference of each alternative with respect to the objective of the problem.

**Table 3.2.** Fundamental scale

Intensity	Definition	Explanation
1	Equal importance	Two activities contribute equally to objective
3	Moderate importance	Experience and trial slightly favor one activity over the other
5	Strong importance	Experience and trial strongly favor one activity over the other
7	Very strong importance	An activity is much more favored than the other and its dominance is demonstrated in practice
9	Extreme importance	Evidence in favor of an alternative over another has the highest possible order for his claim

Source: Saaty, 1980

**Figure 3.6.** Hierarchy of the Cadrete experience



Source: <https://participa.cadrete.es>

### 3.6.1.3 Aspects related with the initiative

#### Size of the municipality (population)

Cadrete is a municipality of the province of Zaragoza. It is located 12 Km south of the Aragonese capital. According to data from the INE from 2009, the town has a population of 2,777.

Political party of the town council

In April 2010, the mayoress of Cadrete was M<sup>a</sup> Ángeles Campillos Viñas who belonged to the Partido Popular (PP). She presided over a coalition government between the PP and the regionalist party, PAR.

Level of electoral participation

The level of electoral participation and the distribution of votes in the municipality of Cadrete in the general elections of 2004 and 2008 and in the municipal elections of 2007, according to data from the Ministerio del Interior, are shown in Table 3.3.

**Table 3.3.** Participation and distribution of votes in Cadrete

<i>Year</i>	<i>Participation</i>	<i>Abstentions</i>	<i>White votes</i>	<i>Null Votes</i>
<b>General Elections 2004</b>	80.2%	19.8%	2.72%	1.0%
<b>General Elections 2008</b>	76.6%	23.4%	2.08%	1.61%
<b>Municipales Elections 2007</b>	69,90%	30,10%	7,93%	1,02%

Source: Moreno-Jiménez and Velázquez, 2011

Age and income of the citizens of the municipality

According to data from the Instituto Aragonés de Estadística<sup>27</sup> (IAEST), in 2008, there were 1,949 persons in Cadrete with the right to vote (voters) and the per capita gross disposable income in 2006 was 18,675 € per annum.

**3.6.1.4 Analysis of the process**

Development of the consultation

In the first vote<sup>28</sup>, as can be seen in Table 3.5, 43 participants voted electronically, 37 of which were citizens, 3 politicians and 3 associations, representing 2.17% of the total census and 14.96% of the weighted participation.

With respect to the results of the first vote, the participants opted for the cultural criteria (52.99%) over sports (47.01%), as is shown in Table 3.6.

<sup>27</sup> [http://portal.aragon.es/portal/page/portal/IAEST/IAEST\\_0000/IAEST\\_08](http://portal.aragon.es/portal/page/portal/IAEST/IAEST_0000/IAEST_08).

<sup>28</sup> The results of the first vote can be consulted at <https://participa.cadrete.es/resultadosobtenidos.htm#ronda1>.

After the first vote and until the day before the second vote, a forum of debate was opened on the Internet on which participants expressed their concerns and preferences, as is shown in Table 3.4.

**Table 3.4.** Messages and comments in forum of Cadrete<sup>29</sup>

	<i>Total messages</i>	<i>Total comments</i>	<i>Total</i>
<b>Culture</b>	37	114	151
<b>Sport</b>	24	81	105
<b>Total</b>	61	195	156

Source: Moreno-Jiménez and Velázquez, 2011

A total of 61 messages were posted, 37 of which belonged to the cultural criteria and 24 to sports. There were 195 comments about these messages, of which 114 belonged to the cultural criteria and 81 to sports.

In the second vote, as is shown in Table 3.5, there were 41 participants of which 35 were citizens, 4 politicians and 2 associations, representing a weighted participation of 17.60% (2.08% of the total census).

**Table 3.5.** Development of the 2 votes

<i>Participants</i>	<i>Census</i>	<i>Electronic voting in the 1st voting</i>	<i>Percentage</i>	<i>Electronic voting in the 2nd voting</i>	<i>Percentage</i>
<b>Citizen</b>	1949*	37	1.9%	35	1.8%
<b>Politicians</b>	11	3	27.3%	4	36.7%
<b>Associations</b>	15	3	20%	2	13.3%
<b>Total weighted</b>	1975	43	2.17% (14.96%)	41	2.08% (17.60%)

Source: Moreno-Jiménez and Velázquez, 2011

[\*] This figure corresponds to citizens over 18 with the right to vote in 2008, according to data from the Instituto Aragonés de Estadística (IAEST)

As can be seen when analyzing the evolution of the vote in the two rounds, the variations in absolute terms were minimal although, due to the small number of voters, the relative variation, at least with respect to politicians and associations, show significant modifications. The percentage of politicians voting has increased (from the first to the second round) by 33.3% and that of associations has fallen by the same percentage (33.3%).

<sup>29</sup> The results of the forum can be consulted at: <https://participa.cadrete.es/resultadosobtenidos.htm#foro>.

With respect to the result, the voters again opted for cultural criteria (56.58%) over sports (43.42%), the difference between them increasing in comparison with the first vote, as is shown in Table 3.6.

**Table 3.6.** Priorities of the criteria of each group of actors

Criteria	Citizens	Politicians	Associations	Total Vote
<b>1st vote</b>				
Cultural	57.64%	53.35%	39.33%	52.99%
Sports	42.36%	46.65%	60.67%	47.01%
<b>2nd vote</b>				
Cultural	62.56%	50.47%	54.88%	56.58%
Sports	37.44%	49.53%	45.12%	43.42%

Source: Moreno-Jiménez and Velázquez, 2011

The low citizen participation in the electronic experience is in contrast with the municipal (2007) and the general (2004 and 2008) elections whose levels of participation were 69.9% and 76.6%, respectively (Table 3.7).

**Table 3.7.** Percentage of citizen participation in electoral processes in Cadrete

Elections	Participation Rate
Electronic consultation 2010	2.08% (17.60% weighted)
General Elections 2008	76.6%
Municipal Elections 2007	69.9%
General Elections 2004	80.2%

Source: Moreno-Jiménez and Velázquez, 2011

### 3.6.2 Evaluation of the theoretical EF3-framework<sup>30</sup>

After finishing the real-life e-Participation experience based on e-Cognocracy (case of Cadrete), participants were asked to complete an online questionnaire<sup>31</sup>; 24 residents responded though only 20 replies were valid. The questionnaire was considered as invalid if: (i) less than 80% of the questions were answered; and (ii) if there was zero variability with regards to the total number of questions. The measurement scale was from 0 to 10 (0 = total disagreement, 10 = total agreement). 51 questions were grouped into 7 sections: (i) The System of Citizen Participation; (ii) The Creation of a Better Society; (iii) Motivation; (iv) Evaluation of the Technological

<sup>30</sup> Section extracted book chapter: Moreno-Jiménez, Pérez Espés and Wimmer, 2013

<sup>31</sup> This questionnaire is included in Annex 1

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Support and Applications; (v) Evaluation of the Information; (vi) Evaluation of the Support Personnel and (vii) Overall Evaluation.

The theoretical EF3-framework was first evaluated through a survey implemented in the real-life experience of Cadrete using SEM or the Covariance Structure Analysis approach (Bollen, 1989; Bollen and Lennox, 1991; Jöreskog and Sörbom, 1996 and Bentler, 1995-2006). The first data analysis approach was a conjoint descriptive analysis of the variables, based on the measurements of their position, dispersion and correlation. These measurements led to the identification of groups of interrelated indicators that could be expected to define the utilised constructs; this analysis was complemented by an analysis of the main components. The study was completed by means of Structural Equation Models with Latent Variables, or Covariance Structure Analysis (Jöreskog and Sörbom, 1996). This particular methodological approach was chosen as it allows the researcher to formulate and evaluate the existence of latent variables from the reflected indicators (Bollen and Lennox, 1991), that is to say, variables that are not susceptible to direct observation. The software used was EQS 6.1 (Bentler, 1995-2006).

Table 3.8 shows the constructs and indicators used to describe the concepts of effectiveness, efficacy and efficiency in the estimation of the structural model for an EF3-evaluation of e-Cognocracy.

**Table 3.8.** Constructs and indicators.

<b>EFFICACY</b>			<b>A*</b>
<b>INFORMATION</b>	X1	The Administration informs society about the existing mechanisms of citizen participation	<b>5.00</b>
	X2	The Administration informs society about the decisions taken	<b>4.70</b>
<b>COMMUNICATION</b>	X3	Political powers take citizen's opinions into account for the design of public policies	<b>5.00</b>
	X4	Political powers take associations' opinions into account for the design of public policies	<b>4.95</b>
<b>DECISION</b>	X5	The citizen has weight in political decision making	<b>5.15</b>
	X6	Associations have weight in political decisions making	<b>5.05</b>
<b>EXPECTATIONS</b>	X7	The citizen should participate in the design of public policies	<b>7.50</b>
	X8	The citizen should decide together with the elected representatives the design of public policies	<b>7.15</b>
<b>EFFICIENCY</b>			<b>A*</b>
<b>INFORMATION QUALITY</b>	X9	In general, I am satisfied with the information that I have received	<b>6.90</b>
<b>SYSTEM QUALITY</b>	X10	In general, I liked the design of software application	<b>5.95</b>
<b>EFFECTIVENESS</b>			<b>A*</b>
<b>CURRENT SYSTEM</b>	Y1	With the current system of citizen participation, the representatives defend my interests	<b>5.50</b>
<b>FUTURE SYSTEM</b>	Y2	E-Cognocracy improves the current democratic system	<b>7.90</b>
<b>E- COGNOCRACY</b>	Y3	E-Cognocracy contributes to create a better society	<b>7.70</b>

\* Average indicator evaluation.

**Source:** Moreno-Jiménez, Pérez Espés and Rivera, 2013

The indicators concerning *information*, *communication* and *decision*, revealed evaluations that were just above or just below an acceptable level of satisfaction (5.0, 4.7, 5.5, 5.0, 5.2 and 5.1, respectively); *Expectations* reached a high level (7.5 and 7.2), which suggests that citizens are not convinced about actively participating in the system. Therefore, efficacy is defined by the indicators *information*, *communication*, *decision* and *expectations*.

In general, the average valuations of the indicators of efficiency were relatively high. The participants gave a more positive valuation to the *service quality* (8.50) than to the *information* and *system quality* (7.0 and 6.0, respectively). The correlation was over 0.7, which indicates that the structure should be maintained. Therefore, efficiency is defined by the participants' satisfaction with the *quality of information and of the system*.

E-Cognocracy was given a more positive evaluation than the current system of citizen participation (*current situation*), both in terms of its ability to improve the current system (*future situation*) and to achieve its ultimate goal - the creation of a

better society (7.9 and 7.7 compared to 5.5). It is therefore clear that the improvement of the current system and the creation of a better society require the introduction of more dynamic and participative mechanisms, such as those employed by e-Cognocracy. All of that is defined as effectiveness.

The role of the citizen is perceived as being as relevant as that of the Associations. The relationships between the indicators were coherent with the constructs.

The Confirmatory Factor Analysis (see Table 3.9) offered sufficient evidence to maintain a first order structure of four correlated factors from the eight observed variables. The structures of the constructs, in theoretical terms, were empirically corroborated at both an exploratory and a confirmatory level. The eight indicators reflected a structure of four interrelated latent variables.

Table 3.9 also shows that the relationships between the dimensions of *information*, *communication* and *decision* are positive and this implies that a higher perception of information signifies a higher perception of *communication* and *decision*, and vice versa. The relationship between *expectations* and *decision* is negative, and this implies that citizen disappointment with regards to the existence of *decision* is greater if they have greater *expectations* of participation. Reliability indices for both these observed variables and their respective latent variables were more than acceptable ( $R^2$ , omega and C-FL).

**Table 3.9.** Confirmatory Factor Analysis Model

		Mean	INFO.	COM.	DEC.	EXP.	Efficiency	R <sup>2</sup>
INFORMATION	X1	5.0	0.99***					0.98
	X2	4.7	0.87***					0.76
COMMUNICATION	X3	5.5		0.95***				0.90
	X4	5.0		0.98***				0.96
DECISION	X5	5.2			0.90***			0.81
	X6	5.1			0.78***			0.61
EXPECTATION	X7	7.5				0.70***		0.49
	X8	7.2				0.97***		0.94
EFFICIENCY	X9	7.0					0.83***	0.69
	X10	6.0					0.86***	0.74
INFORMATION	INF		1					
COMMUNICATION	COM		0.40*	1				
DECISION	DEC		0.26*	0.57**	1			
EXPECTATIONS	EXP		-0.10	-0.04	-0.26	1		
EFFICIENCY	Efficiency		0.29*	-0.37*	-0.28*	0.27	1	
	C-FL		0.87	0.93	0.71	0.72	0.71	
	Omega		0.93	0.97	0.84	0.84	0.85	

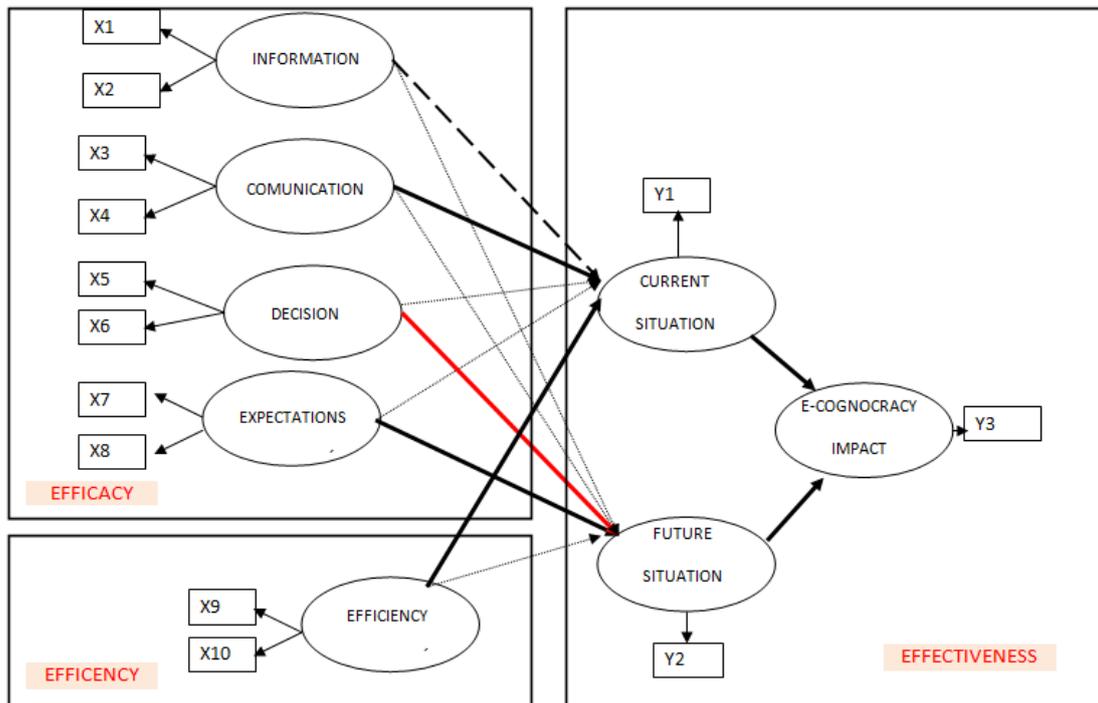
$\chi^2_{(25)}$ : 26.97, p-value: 0.52; SRMR: 0.07; GFI: 0.90; CFI: 0.99.

\* significant to 10%, \*\* significant to 5% and \*\*\* significant to 1%

**Source:** Moreno-Jiménez, Pérez Espés and Rivera, 2013

Figure 3.7 depicts the estimated structural model. Table 3.10 shows the estimated structural model; there are three determinants of the citizen’s perception of the current system: *information*, *communication* and *efficiency*. Determinants of the *future situation* are *decision* (negative) and *expectations*. The *current and future situations* affect the perception of the creation of a better society, though the effect of the *future situation* (e-Cognocracy) is greater.

**Figure 3.7.** Estimated Structural Model for an EF3-evaluation of e-Cognocracy



**Table 3.10.** Structural Model

	Mean	INFO.	COM.	DEC.	EXP.	Efficiency	CUR.S.	FUT.S.	R <sup>2</sup>
CURRENT SYSTEM	Y1	5.5	0.31*	0.38**	0.11	0.04	0.50**		0.58
FUTURE SYSTEM	Y2	7.9	0.14	0.05	-0.45*	0.38*	0.03		0.40
E-COGNOCRACY	Y3	7.7					0.37**	0.51***	0.41

$\chi^2_{(46)}$ : 43.16, p-value: 0.71; SRMR: 0.07; GFI: 0.90; CFI: 0.99.  
 \* significant to 10%, \*\* significant to 5% and \*\*\* significant to 1%

**Source:** Moreno-Jiménez, Pérez Espés and Rivera, 2013

If the citizens perceive that information exists, that is to say, that the Administration informs society of the participation mechanisms and the decisions that are taken (top-down unidirectional flow), then they have a positive perception of the current system of representation. If communication exists, that is to say, information

flows in both directions (feedback), it is also a determinant, but this is not the case with decision and expectations. Moreover, if citizens feel that they have no influence on the taking of political decisions, irrespective of their perceptions of the existence of information and communication, they will favour a change in the participation system. If the citizens have higher expectations of involvement in the design and formulation of public policies, they will also favour change.

Due to the limited number of responses, it was not possible to validate a general framework for the conjoint evaluation of all the aspects outlined in the theoretical EF3-framework. Nevertheless, the results obtained from the 20 valid responses identified a series of relationships that contributed to the formulation of a general framework (Moreno-Jiménez, Pérez Espés and Rivera, 2013). The small sample size means that the evaluation and selection of the models is governed by goodness of fit indicators (SRMR, GFI and CFI) that do not directly depend on the number of observations (Bollen, 1989). For all the measured and/or structural models, the estimated parameters were presented in their completely standardised version, norm 0-1, and, in addition, all the equations were given their corresponding coefficients of explained variance. The assessment of the construct is based on the methodology proposed by Bagozzi (Bagozzi, 1984) for the validation of multidimensional constructs and the covariance structure analysis of observed variables (McDonald's omega coefficient (McDonald, 1985) and Fornell and Larcker's coefficient, C-FL (Fornell and Larcker, 1981). The stability of the parameters of the models was estimated and evaluated sequentially.

Although the simplified analysis of the theoretical EF3-framework has not permitted us to obtain significant statistical conclusions, it has allowed us, together with a study of the existing literature, to extend this framework to evaluate any e-Participation experience, not only e-Cognocracy.

### 3.7 EXTENSION OF THE THEORETICAL EF3-FRAMEWORK FOR ANY E-PARTICIPATION EXPERIENCES<sup>32</sup>

After identifying the relevant aspects from evaluating the theoretical EF3-framework of e-Cognocracy, and with the aim of extending the framework to any e-participation experience, the next step was to extend the framework for each criterion (effectiveness, efficacy and efficiency). This included identifying a set of attributes, indicators and weights for evaluating e-Participation experiences, which we describe below.

**Table 3.11.** Attributes and indicators for the evaluation of effectiveness

CRITERION: EFFECTIVENESS			
ATTRIBUTES	DESCRIPTION	INDICATORS	
P E O P L E	<b>CONTROL (CO-DECISION)</b>	The % of the citizens in the decision making process and the possibility of putting forward specific situations that are conjointly resolved and validate the politicians that are in power (motions of confidence in decisions).	% assigned to citizens to decide a policy/decision
	<b>PARTICIPATION (CO-CREATION)</b>	Participation has been evaluated in many ways; in this case, the people that follow the discussions that create content and those that vote will be measured, along with the number of arguments that can be extracted from the discussion and decision processes	Clear track from participatory endeavour to the political decisions and the policy implementation People who contributed to enhance the participation How many topics were proposed for implementing the participation process % of participation of population contributing to the polls % of participation of population contributing to the discussion; number of messages Number of political representatives engaging, including meetings with the citizens
	<b>LEARNING (FORMATION)</b>	The changes in and impacts of individual preferences between the two voting rounds and the discussion stage. The opinions of the others participants have influenced their final decisions.	I think that the discussions carried out in the forum have influenced my decisions (a question from the survey)
	<b>FREEDOM (TOLERANCE)</b>	The % of vetoed messages; the % of ideologically intransigent messages; the % of individuals with a change in the preference structure.	% censored messages; % ideological intransigent messages
	S O C I E T Y	<b>SUBSISTENCE</b>	The selection of the best individuals for the management of the systems
<b>COHESION</b>		Qualified consensus (clear majorities) and limited veto. The number of groups that can be identified among individuals must be determined in the final decision.	Homogeneity of opinions, preferences and norms
<b>EQUITY</b>		Equal opportunity for all. There should be no digital, economic, social or cultural divides.	The Administration informs society about the decisions taken and the existing mechanisms for citizen participation (question from a survey)
<b>SOCIAL WISDOM</b>		The creation of a cultural resource of ethical values. The leaders should become a point of reference for society and, by example, engender ethical values (the social rejection of corruption, dishonest behaviour etc.).	A e-Participation experience contributes to create a better society (question from a survey)

Source: Pérez-Espés et al., 2014

Effectiveness, as associated with analysing “doing what is right” and evaluating “current situation”, “future situation” and “impact of e-cognocracy” (Moreno-Jiménez,

<sup>32</sup> Section extracted from the chapter of the book: Pérez-Espés et al., 2014.

Pérez Espés and Rivera, 2013) is now extended to incorporate relevant attributes and indicators for the evaluation of effectiveness. An initial set of attributes evaluating effectiveness was proposed in (Moreno-Jiménez, Pérez Espés and Rivera, 2013). This set is now refined and grouped into attributes related to individual perception as well as attributes related to the impact on society as a whole. The attributes and indicators are shown in Table 3.11.

Efficacy, assessing the achievement of goals (Moreno-Jiménez, 2006) considers four attributes, as indicated in Figure 3.5 and described above. The extension of the framework incorporates the associated indicators for each attribute (see Table 3.12). The extension, therefore, refers to the inclusion of the attributes to evaluate each indicator already contained in the original theoretical EF3-framework.

**Table 3.12.** Attributes and indicators for the evaluation of efficacy

<b>CRITERION: EFFICACY</b>		
<b>ATTRIBUTES</b>	<b>DESCRIPTION</b>	<b>INDICATORS</b>
INFORMATION	Existence of an unequivocal Administration-Citizen relationship	Government informs society about the mechanisms of citizen participation and the decisions taken
COMMUNICATION	Existence of feedback	Government takes the opinions of the citizens into account in their decisions
DECISION	A higher level of the relationship, that is to say, implication in the result or final selection	Citizens influence the making of public decisions
EXPECTATIONS	Active participation and conjoint decision	Citizenry and their representatives should jointly participate and decide on the design of public policies

**Source:** Pérez-Espés et al., 2014

Efficiency, being associated with assessing “doing things correctly” (Moreno-Jiménez, 2006), also contains the three attributes the original theoretical EF3-framework (Figure 3.5) proposes but completes them with other indicators, as shown in Table 3.13.

**Table 3.13.** Attributes and indicators for the evaluation of efficiency

CRITERION: EFFICIENCY		
ATTRIBUTES	DESCRIPTION	INDICATORS
System Quality	Information Technology application should consider items like: Convenience, Navigation, Interactivity, Response time, Access	The tools used in the experience were appropriate, easy to use, navigate etc.
Information Quality	The obtained information should contemplate items like: Precision, Relevance, Reliability, Ease of Understanding, Usefulness, Conciseness	The information was easy to understand, appropriate, without mistakes...
Service Quality	The human resources support should contemplate items like: Interpersonal quality, Empathy, Responsiveness, Flexibility	Level of help from the support staff when participating in the experience

**Source:** Pérez-Espés et al., 2014

In the next section, we present the results from validating the extension of the theoretical EF<sup>3</sup>-framework by international experts. The validated framework was called: the EF<sup>3</sup>-framework.

### **3.8 VALIDATING THE EXTENSION OF THE THEORETICAL EF<sup>3</sup>-FRAMEWORK<sup>33</sup>**

The extension of the theoretical EF<sup>3</sup>-framework, as put forward in Section 3.7, was validated by a group of experts through a questionnaire<sup>34</sup>. In this section, we outline the methodical validation context and describe the contributions of the experts, including suggestions for revision and the assignment of weights to attributes and indicators of the three criteria.

#### **3.8.1 Methodical context of expert validation**

The theoretical EF<sup>3</sup>-framework was reviewed and validated by international experts that were selected from the contacts of the authors and from scanning literature on e-participation evaluation. Nine experts agreed and filled in the questionnaire. They have the following backgrounds (names and locations omitted for anonymity purposes):

- Four professors with academic backgrounds in: economics, e-government, political science, public administration, law and statistics.

<sup>33</sup> Section extracted from the chapter of the book: Pérez-Espés et al., 2014

<sup>34</sup> This questionnaire is included in Annex 2

- Five senior experts with competencies in: citizen participation, e-participation, political science, public administration, public law.

The validation of the extension of the theoretical EF<sup>3</sup>-framework was performed through a written questionnaire. Experts responded with their views and weights. The questionnaire was structured in three parts: (1) the extended EF<sup>3</sup>-framework was introduced. Experts were asked to validate the framework by commenting the criteria and respective sets of attributes and indicators as explained in Section 3.7. Experts could also suggest amendments or revisions. (2) Experts were asked to assign weights to each attribute of a criterion based on the expert's perceived importance of respective attributes.

### **3.8.2 Feedback of the group of experts on the framework**

Overall, experts agreed with the need for fine-tuning indicators to make e-participation experiences clearly measurable by establishing qualitative or quantitative and, thus, specific measurements. Almost all experts advised that more details on the indicators would make it easier to understand the meaning of each one.

With respect to Effectiveness, it was suggested that the attribute "social wisdom or collective intelligence" be renamed "civic intelligence" as, for instance, put forward in (Schuler, 2007). Likewise, experts suggested that the attribute "subsistence" might be more appropriately named "significance" or "representativeness", as this concept would better indicate the selection of the individuals who can contribute more.

With respect to Efficacy, most experts agreed about the need to explain the differences between the indicators of "communication" and "decision" better. Some experts also advised taking into account another attribute, "accountability", especially when "information" and "communication" are referred to. Others suggested that Efficacy only consists of a criterion called "engagement", and they think that "expectations" should not be contemplated as an attribute of Efficacy.

With respect to Efficiency, most experts agreed that this term is an economic concept, confirming the need to analyze the effort and result in relation to the resources spent. Others suggested including another attribute: "quality of participation". Some of

them commented that the human resources support could influence the final decisions of the citizen, thus confirming the attribute “service quality”.

### 3.8.3 Assigned weights

The arithmetic mean of the weights assigned to the attributes given individually by each expert is shown in Table 3.14. Some experts did not assign weights to the attributes because they consider that all indicators should have the same importance without discrimination among them.

**Table 3.14.** Assigned weights to each attribute of the three criteria

EFFECTIVENESS			
ATTRIBUTES		WEIGHT	
P E O P L E	Control (Co-Decision)	27%	56%
	Participation (Co-creation)	46%	
	Learning (Formation)	15%	
	Freedom (Tolerance)	12%	
O C I E T	Subsistence	19%	44%
	Cohesion	18%	
	Equity	33%	
	Social Wisdom	30%	

EFFICACY	
ATTRIBUTES	WEIGHT
Information	21%
Communication	25%
Decision	26%
Expectatives	28%

EFFICIENCY	
ATTRIBUTES	WEIGHT
System Quality	30%
Information Quality	42%
Service Quality	28%

Source: Pérez-Espés et al., 2014

Most experts agree that the values are difficult to interpret. They argue that more description is needed as to what questions were asked to obtain these indicator values. They advise a better match between the questions asked in the questionnaire and the mapping thereof to each criteria of the EF3-framework.

### **3.9 EF3-FRAMEWORK APPLIED TO REAL LIFE EXPERIENCE IN CADRETE<sup>35</sup>**

In this section, we will present the application of the validated framework by the experts (EF3-framework) to an e-Participation experience: the real-life experience carried out in Cadrete. This experience, as already mentioned, is based on e-Cognocracy but, at the same time, is considered an experience of e-Participation (participatory budgeting). This case is going to provide a proof of concept of the EF3-framework.

As was commented above, after finishing the experience of Cadrete, participants were asked to complete an online questionnaire to evaluate the attributes. The data provided by that questionnaire have been used to establish some of the indicators of the EF3-framework.

The tables below outline the application of the EF3-framework to evaluate the effectiveness, efficacy and efficiency of the e-Participation experience in Cadrete.

Table 3.15 shows the indicators and the values obtained in order to evaluate each attribute of effectiveness in the real-life experience. Some of the indicators selected are questions from the survey (they are the average (mean value) of the scores given by the citizens of Cadrete in the survey). Table 3.16 shows the indicators and the values obtained in order to evaluate each attribute of efficacy. The indicators selected are questions from the survey. The “Cadrete values” are the average (arithmetic mean) of the scores given in the questionnaire by the citizens of Cadrete. Table 3.17 shows the indicators and the values obtained to evaluate each attribute of efficiency. The indicators selected are questions from the survey. The “Cadrete values” are the averages (= mean value) of the scores given by the citizens of Cadrete in the questionnaire.

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<sup>35</sup> Section extracted from the chapter of the book: Pérez-Espés et al., 2014

**Table 3.15.** Indicators and values obtained for the evaluation of effectiveness in the Cadrete experience

CRITERIA: EFFECTIVENESS			
ATTRIBUTES	CADRETE INDICATORS	CADRETE VALUE	
P E O P L E	CONTROL (CO-DECISION)	% assigned to citizens to decide a policy/decision Politicians: 40%; Citizens: 44%; Associations: 16%	
	PARTICIPATION (CO-CREACION)	An experience like this one has allowed me to feel involved in political decision making	Average: 6.68 (1-10)
		I consider that this is a very important opportunity to give my opinion	Average: 8.05 (1-10)
		I am interested in participating in the planning of cultural and sports activities	Average: 7.41 (1-10)
		I would participate again in an experience like this one	Average: 8.73 (1-10)
		The system of discussion has allowed me to know others' opinions and share my own	Average: 5.36 (1-10)
	LEARNING (FORMATION)	I have learnt a lot from this experience	Average: 7.14 (1-10)
FREEDOM (TOLERANCE)	% censored messages; % ideological intransigent messages	0%	
S O C I E T Y	SUBSISTENCE	With the current system of citizen participation, the representatives defend my interests	Average: 5.45 (1-10)
	COHESION	Other municipalities should incorporate this type of citizen participation	Average: 8.41 (1-10)
	EQUITY	The Administration informs society about the existing mechanisms of citizen participation	Average: 5.45 (1-10)
	SOCIAL WISDOM	This citizen participation initiative contributes to create a better society	Average: 7.73 (1-10)

Source: Pérez-Espés et al., 2014

**Table 3.16.** Indicators and values obtained for the evaluation of efficacy of the Cadrete experience

CRITERION: EFFICACY		
ATTRIBUTES	CADRETE INDICATORS	CADRETE VALUE
INFORMATION	The Administration informs society about the existing mechanisms of citizen participation	Average: 5 (0-10)
	The Administration informs society about the decisions taken	Average: 4.7 (0-10)
COMMUNICATION	Political powers take citizens' opinions into account for the design of public policies	Average: 5 (0-10)
DECISION	The citizen has weight in political decision making	Average: 5.15 (0-10)
EXPECTATIONS	The citizen should participate in the design of public policies	Average: 7.5 (0-10)
	The citizen should decide together with the elected representatives the design of public policies	Average: 7.15 (0-10)

Source: Pérez-Espés et al., 2014

**Table 3.17.** Indicators and values obtained for the evaluation of efficiency of the Cadrete experience

<b>CRITERION: EFFICIENCY</b>		
<b>ATTRIBUTES</b>	<b>CADRETE INDICATORS</b>	<b>CADRETE VALUE</b>
System Quality	In general, I liked the design of the software application	Average: 5.8 (0-10)
	In general, I am satisfied with the computer application used	Average: 5.95 (0-10)
<b>ATTRIBUTES</b>	<b>CADRETE INDICATORS</b>	<b>CADRETE VALUE</b>
Information Quality	In general, I am satisfied with the information that I received	Average: 6.9 (0-10)
<b>ATTRIBUTES</b>	<b>CADRETE INDICATORS</b>	<b>CADRETE VALUE</b>
Service Quality	In general, I am satisfied with the help of the support personnel	Average: 8.5 (0-10)

**Source:** Pérez-Espés et al., 2014

The application of the EF3-framework to the real-life experience in Cadrete was also presented to the group of experts. They could provide suggestions and comments about the evaluation framework. Most of the experts considered the indicators that determine the attributes of each criterion appropriate. Most of them also suggested that the framework should be tested in further e-Participation endeavors because the case of Cadrete has some limitations.

### **3.10 EVALUATION OF THE CADRETE EXPERIENCE**

This section presents the evaluation, in terms of effectiveness, efficacy and efficiency, of the real-life experience carried out in Cadrete. To do this, the technique of multi-criteria decision making called *Analytic Hierarchy Process (AHP)* and its corresponding software called *Expert Choice* are used.

#### **3.10.1 Methods of evaluation and multi-criteria decision making<sup>36</sup>**

The taking of decisions is a process of selection between alternatives courses of action, based on a set of criteria, to reach one or more objectives (Simon, 1965).

<sup>36</sup> Eduardo Martínez and Mauricio Escudey, “Evaluación y Decisión Multicriterio —reflexiones y experiencias”, Editorial Universidad de Santiago/UNESCO, Santiago de Chile, 1998

In the mid-1950s, in U.S academic media (Koopmans, 1951; Kuhn and Tucker, 1951) in the new research field of operations research, the systematic study of the theoretical and methodological questions of multi-criteria decision making arose. After the beginning of the 70s<sup>37</sup>, there was a continuous expansion of interest and theoretical and practical developments of the methods of multi-criteria decision making

Methods of evaluation and multi-criteria decision making involve selection from among a set of feasible alternatives, optimization with several simultaneous objective functions and only one decision maker and rational and consistent evaluation procedures.

Methods of Discrete Multi-criteria Decision Making are used to carry out the evaluation and decision with respect to problems that, by nature or design, admit a finite number of alternative solutions through:

1. A stable set of alternatives, generally finite (feasible -that fulfill the restrictions-, possible or foreseeable solutions); each one is assumed to be perfectly identified although all their quantitative and qualitative consequences are not necessarily known exactly and completely.
2. A family of evaluation criteria (attributes, objectives) that permit the evaluation of each alternative, in accordance with the weights assigned by the decision maker and that reflect the relative importance (preference) of each criterion; the properties of a consistent family of criteria are: completeness, coherence, independence, functionality, measurability and economy.
3. A decision or impact matrix that summarizes the evaluation of each alternative in accordance with each criterion; an evaluation (precise or subjective) of each of the solutions in the light of each of the criteria; the measurement scale of the evaluations can be quantitative or qualitative, and the measurements can be expressed in cardinal scales (reason and interval), ordinal, nominal, and probabilistic.

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<sup>37</sup> 1st. World Conference on Multiple Criteria Decision Making (South Carolina University, U.S.A., 1972)

4. A methodology or model of aggregation of preferences in a global synthesis; organization, classification, partition, or prioritization of the judgments that determine the solution that globally receives the best evaluations.
5. A decision-making process in which a consensual negotiation is carried out among the actors or interested parties (analyst-“expert”-, decision maker, and user).

Methods of Multi-criteria Decision Making are used to carry out an evaluation and decision with respect to problems that may present an infinite set of alternatives as solutions. The objective functions (criteria) may adopt an infinite number of values (a continuum).

The main methods of evaluation and discrete multi-criteria decision are: *Linear Weighting (scoring)*, *Multi-attribute utility theory (MAUT)*, *Outranking methods* and *the Analytic Hierarchy Process (AHP)*.

#### **3.10.1.1 Linear Weighting (scoring)**

This method allows the addressing of situations of uncertainty or with few levels of information. In this method, a value function is constructed for each of the alternatives. The method of Linear Weighting assumes the transitivity of preferences; it is a completely compensatory method and may be dependent, and manipulable, on the assignment of weights to the criteria or to the measurement scale of the evaluations. It is an easy and widely used method.

#### **3.10.1.2 Multi-attribute utility theory (MAUT)**

For each attribute, the corresponding (partial) utility function is determined and, then, they are aggregated into a multi-attribute utility function using additive or multiplicative processes. By determining the utility of each of the alternatives, a complete ordering of the finite set is obtained. The method of multi-attribute utility assumes the transitivity of preferences, uses interval scales, and accepts the principle of rank preservation. The condition of mutual preferential independence between the attributes is usually accepted almost axiomatically; it is implicitly questionable and does

not reflect the structure of the preferences of the decision maker. The rigor and rigidity of the theoretical suppositions of this method, usually controversial and difficult to test in practice, make it necessary to relax them and require a high level of information for the decision maker to construct the multi-attribute utility functions, although they permit the addressing of questions of uncertainty and risk smoothly. In spite of the difficulties in its use, this method has been employed in a variety of practical experiences in the U.S.A. and in the U.K.

### **3.10.1.3 Outranking methods**

The basic mechanism used by these methods is that of the pairwise comparison of alternatives, that is, a two by two comparison of the alternatives, criterion by criterion. In this way, a coefficient of concordance  $C_{ik}$  can be constructed that is associated with a pair of alternatives  $(a_i, a_k)$ . There are two methods of the French school, ELECTRE and PROMETHEE. Of the ELECTRE (Elimination et Choix Traduisant la Réalité) method, there are already several versions that use pseudo-criteria and the theory of fuzzy sets. The PROMETHEE (Preference Ranking Organization Method for Enrichment Evaluation) method has been applied, with forecasting, for location problems.

### **3.10.1.4 Hierarchic Analysis**

The Analytic Hierarchy Process (AHP) is a general theory of measurement. It is used to derive ratio scales from both discrete and continuous paired comparisons. These comparisons can be taken from actual measurements or from a fundamental scale which reflects the relative strength of preferences and feelings. The AHP has a special concern with departure from consistency, its measurement and on dependence within and between the groups of elements of its structure. It has found its widest applications in multi-criteria decision making, planning and resource allocation and in conflict resolution (Saaty 1980, 1982 and 1986). In its general form, the AHP is a nonlinear framework for carrying out both deductive and inductive thinking without use of the syllogism by taking several factors into consideration simultaneously and allowing for dependence and for feedback, and making numerical tradeoffs to reach a synthesis or conclusion. T. L. Saaty developed the AHP in 1971-1975 while at the Wharton School (University of Pennsylvania, Philadelphia, Pa) (Saaty, 1987).

## **Expert choice<sup>38</sup>**

The AHP has support software called Expert Choice and it has been applied in a wide range of practical experiences in very diverse fields in different countries of the world. Expert Choice is the program most used for the application of the AHP. This commercial program works in a Windows environment, is easy to use and serves as a referral mechanism for participative consensuses. The development of Expert Choice has been supervised by Saaty himself, making it the best option.

### **3.11 EVALUATION OF THE CADRETE EXPERIENCE**

#### **3.11.1 Results**

As has already been commented, to evaluate the experience of e-Participation that, based on e-Cognocracy, was carried out in Cadrete, the technique of multi-criteria decision making called analytic hierarchy process (AHP) is going to be used. To do so, the Expert Choice v11.5 software has been used.

This section presents the steps of the AHP methodology (modeling, evaluation, prioritization and final evaluation) applied to the evaluation of the Cadrete experience.

#### **3.11.2 Modeling of the problema**

##### **Hierarchic structure of the problem**

To establish the hierarchic structure used in the resolution of our objective problem, the following steps were followed: i) definition of the problem to be resolved, ii) identification of the criteria and attributes, iii) identification of the alternatives, and iv) definition of the hierarchic model employed.

The objective of the problem in question was to evaluate the experience of e-Participation carried out in Cadrete. To address this problem, we used the EF3-framework applied to Cadrete and validated by the group of experts (see section 3.9).

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<sup>38</sup> [www.expertchoice.com](http://www.expertchoice.com)

To do so, the same criteria and attributes contained in the EF3-framework were selected (see Table 3.18).

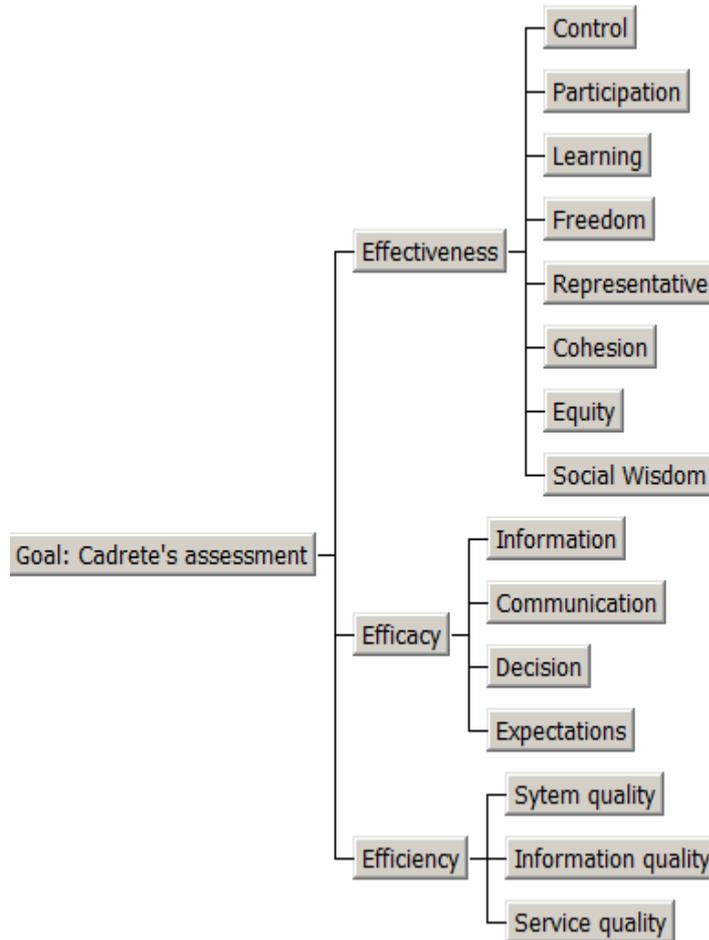
**Table 3.18.** Criteria and attributes for the evaluation of the Cadrete experience

Criteria	Attributes	Code
<b>Effectiveness</b>	Control	AT1
	Participation	AT2
	Learning	AT3
	Freedom	AT4
	Representativeness	AT5
	Cohesion	AT6
	Equity	AT7
	Social Wisdom	AT8
<b>Efficacy</b>	Information	AT9
	Communication	AT10
	Decision	AT11
	Expectations	AT12
<b>Efficiency</b>	System Quality	AT13
	Information Quality	AT14
	Service Quality	AT15

For the criterion of effectiveness, 8 attributes (control, participation, learning, freedom, representativeness, cohesion, equity and social wisdom) were identified. The criterion of efficacy was defined by 4 attributes (information, communication, decision and expectations). Finally, for the criterion of efficiency, 3 attributes were identified (information quality, system quality and service quality).

Having defined the problem and identified the criteria with their corresponding attributes and the alternatives to study (the Cadrete experience itself), the next step was to define the hierarchic figure. Figure 3.9 shows the hierarchic structure followed for the resolution of our objective problem.

**Figure 3.8.** Hierarchic structure of the evaluation of the Cadrete experience



### 3.11.3 Evaluation

After modeling the problem, the following step of the methodology is to evaluate, by means of the judgments emitted to fill in the Pairwise Comparison Matrices (PCM) and the weights awarded by the experts, the criteria and their corresponding attributes.

#### 3.11.3.1 Assignment of weights

Table 3.19 shows the weights assigned to the criteria.

**Table 3.19.** Weights assigned to each criteria

Criteria	Weights (%)
Effectiveness	0.5
Efficacy	0.3
Efficiency	0.2

Greater weight was assigned to the criterion of effectiveness (0.5) because public administrations must, fundamentally, pursue the effectiveness of the system (subsistence of the species) and not so much the efficacy and efficiency of the system, given that the last two are not strictly democratic values (Moreno, 2006).

The weights assigned to the attributes in the resolution of our problem are the same as those awarded by the group of experts (see Table 3.14).

Table 3.20 shows the weights and the global weights awarded to each criterion and its corresponding attributes.

**Table 3.20.** Weights and global weights assigned to the criteria and attributes

Criteria	Attributes	CODE	Weights	Global Weights
EFFECTIVENESS 0.5	Control	AT1	0.151	0.076
	Participation	AT2	0.258	0.129
	Learning	AT3	0.084	0.042
	Freedom	AT4	0.067	0.034
	Representativeness	AT5	0.084	0.042
	Cohesion	AT6	0.079	0.04
	Equity	AT7	0.145	0.073
	Social Wisdom	AT8	0.132	0.066
EFFICACY 0.3	Information	AT9	0.21	0.063
	Communication	AT10	0.25	0.075
	Decision	AT11	0.26	0.078
	Expectations	AT12	0.28	0.084
EFFICIENCY 0.2	System Quality	AT13	0.3	0.06
	Information Quality	AT14	0.42	0.084
	Service Quality	AT15	0.28	0.056

### 3.11.3.2 Judgments and comparison

A judgment or comparison is the numerical representation of a relation between two elements that share a common parent. The set of these judgments can be represented in a square matrix in which the set of elements is compared to itself. These matrices are called Pairwise Comparison Matrices (PCM). Each judgment represents the dominance of an element of the left-hand column over an element of the top row. It reflects the response to two questions: which of the two elements is more important with respect to a criterion in the superior level and how much stronger, using the

Fundamental Scale proposed by Saaty (1980) (presented previously in Table 3.2-Section 3.6.1) is the element on the left than the element in the upper part of the matrix. If the element on the left is less important than the element in the superior part of the matrix, the reciprocal value is introduced in the corresponding position of the matrix. It is important to bear in mind when comparing the intensity of the preferences that the less important element is always taken as unity and the more important is calculated as an approximate multiple of that unity. For a matrix of order  $n$ ,  $n(n-1)/2$  paired comparisons are necessary because there are  $n$  ones on the main diagonal principal and PCM are reciprocal ( $a_{ji} = 1/a_{ij}$ ). To calculate the priorities, a minimum of  $(n-1)$  judgments are necessary to connect all the nodes (Saaty, 1994; Moreno-Jiménez, 2002)

To evaluate, in general, different experiences of participation and, in particular, the Cadrete experience the module *Ratings of Expert Choice* will be employed. After calculating the global priorities of the different attributes, 15 in our case (8 for effectiveness, 4 for efficacy and 3 for efficiency), the categories contemplated for each attribute are defined and, through pairwise comparisons, the relative priorities of the categories of each attribute are calculated. Below, five categories or modalities are considered for each attribute (VG: very good; G: good; A: average; B: bad and VB: very bad).

In what follows, the pairwise matrices considered for each of the attributes of our problem to be resolved are shown. Three different types of matrices are elaborated depending on the importance awarded to each attribute.

For the attributes *control*, *representation*, *social wisdom*, *communication*, *decision* and *information quality*, the matrix presented in Table 3.21 was constructed.

**Table 3.21.** Matrix of pairwise comparisons of the attributes: AT1, AT5, AT8, AT10, AT11, AT14.

AT1, AT5, AT8, AT10, AT11, AT14	VG	G	A	B	VB
VG	1	5	6	7	8
G	1/5	1	4	6	7
A	1/6	1/4	1	4	6
B	1/7	1/6	1/4	1	3
VB	1/8	1/7	1/6	1/3	1

For the attributes *learning*, *expectations*, and *system quality*, the matrix presented in Table 3.22 was constructed.

**Table 3.22.** Matrix of pairwise comparisons of the attributes: AT3, AT4, AT13

AT3, AT4, AT13	VG	G	A	B	VB
VG	1	4	6	7	8
G	1/4	1	4	6	7
A	1/6	1/4	1	3	5
B	1/7	1/6	1/3	1	3
VB	1/8	1/7	1/5	1/3	1

For the attributes *participation*, *freedom*, *cohesion*, *equity*, *information*, and *service quality*, the matrix presented in Table 3.23 was constructed.

**Table 3.23.** Matrix of pairwise comparisons of the attributes: AT2, AT4, AT6, AT7, AT9, AT15

AT2, AT4, AT6, AT7, AT9, AT15	VG	G	A	B	VB
VG	1	3	4	6	7
G	1/3	1	3	4	6
A	1/4	1/3	1	4	5
B	1/6	1/4	1/3	1	3
VB	1/7	1/7	1/5	1/3	1

### 3.11.4 Prioritization

After assigning the weights and establishing the corresponding PCM, the priorities can be calculated.

Table 3.24 shows the priorities assigned to the 15 attributes, according to the categories and the global weights awarded.

**Table 3.24.** Priorities of the attributes and categories

Global Weights	EFFECTIVENESS								EFFICACY				EFFICIENCY		
	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15
VG	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
G	0.439	0.543	0.486	0.543	0.439	0.543	0.543	0.439	0.543	0.439	0.439	0.486	0.486	0.439	0.543
A	0.215	0.323	0.207	0.323	0.215	0.323	0.323	0.215	0.323	0.215	0.215	0.207	0.207	0.215	0.323
B	0.095	0.143	0.108	0.143	0.095	0.143	0.143	0.095	0.143	0.095	0.095	0.108	0.108	0.095	0.143
VB	0.056	0.08	0.061	0.08	0.056	0.08	0.08	0.056	0.08	0.056	0.056	0.061	0.061	0.056	0.08

3.11.5 Evaluation thresholds

To be able to evaluate the Cadrete experience, reference thresholds have been established to permit its evaluation in the following terms: *Very Good (VG)*, *Good (G)*, *Average (A)*, *Bad (B)* or *Very Bad (VB)*,

First, we calculated the score of the 5 possible alternatives considered as references. Table 3.25 presents the scores of these alternatives.

**Table 3.25.** Scoring of the 5 possible alternative references

Global Weights	EFFECTIVENESS								EFFICACY				EFFICIENCY			Scoring
	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	
CATEGORIES/ATTRIBUTES	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	
VG	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
G	0.439	0.543	0.486	0.543	0.439	0.543	0.543	0.439	0.543	0.439	0.439	0.486	0.486	0.439	0.543	
A	0.215	0.323	0.207	0.323	0.215	0.323	0.323	0.215	0.323	0.215	0.215	0.207	0.207	0.215	0.323	
B	0.095	0.143	0.108	0.143	0.095	0.143	0.143	0.095	0.143	0.095	0.095	0.108	0.108	0.095	0.143	
VB	0.056	0.08	0.061	0.08	0.056	0.08	0.08	0.056	0.08	0.056	0.056	0.061	0.061	0.056	0.08	
ALTERNATIVES/ATTRIBUTES	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	Scoring
A1: VERY GOOD	0.076	0.129	0.042	0.034	0.042	0.04	0.073	0.066	0.063	0.075	0.078	0.084	0.06	0.084	0.056	1.000
A2: GOOD	0.033	0.07	0.02	0.018	0.018	0.022	0.039	0.029	0.034	0.033	0.034	0.041	0.029	0.037	0.03	0.489
A3: AVERAGE	0.016	0.042	0.009	0.011	0.009	0.013	0.023	0.014	0.02	0.016	0.017	0.017	0.012	0.018	0.018	0.256
A4: BAD	0.007	0.018	0.005	0.011	0.004	0.006	0.010	0.006	0.009	0.007	0.007	0.009	0.006	0.007	0.008	0.116
A5: VERY BAD	0.004	0.010	0.003	0.003	0.002	0.003	0.006	0.004	0.005	0.004	0.004	0.005	0.004	0.005	0.004	0.066

The first reference, A1, is that named Very Good (VG). In this alternative, all the attributes were considered *Very Good*, which was the maximum score that could be obtained. For A2, all the attributes were considered *Good*. For A3, all the attributes were considered *Average*. For A4, all the attributes were considered *Bad*. Finally, for A5, all the attributes were considered *Very Bad*, the worst possible score (0.066).

The scores obtained in the alternatives considered as references have enabled us to establish the thresholds on which the Cadrete experience can be evaluated.

Table 3.26 shows the thresholds that will permit the evaluation of the experience of e-Participation as VG, G, A, B or VB. For example, if the experience to be evaluated obtained a score between 0.7 and 1, this initiative would be considered as Very Good.

**Table 3.26.** Evaluation thresholds

Levels	Inferior	Superior
VG	0.7	1
G	0.4	0.7
A	0.2	0.4
B	0.1	0.2
VB	0.065	0.1

The thresholds considered to qualify the Cadrete experience have been established on the basis of the results of previous experiences and applications. They will undergo updating in the light of the results obtained in future experiences and of the requirements that are established for each experience.

### **3.11.6 Final evaluation of Cadrete experience**

This section presents how the scoring of the Cadrete experience was calculated, as well as its final evaluation based on the evaluation thresholds established in the previous section.

#### **Scoring of the experience**

Each attribute of the Cadrete experience was defined by one or more indicators. The majority of these indicators were questions in the questionnaire carried out in the experience (see Annex 1). To assign the categories of VG, G, A, B or VB to each of the attributes, the following arguments or rules were used:

- a) The attributes that were defined by questions in the questionnaire were assigned the same value that they obtained in the answers to the questionnaire. If an attribute was defined by more than one indicator, the value used to categorize it was the average value of these indicators. For example, in the case of the attribute Participation (AT2), which was defined by 5 indicators, the final value assigned (7.246) was the average of those indicators.

The questionnaire carried out in the Cadrete experience used an evaluation scale of 0 to 10 for each question. This allowed us to establish the categories in the resolution of our problem. The values obtained in the questions that were between 8 and 10 were categorized as Very Good. Values between 6 and 8 were categorized as Good, and so on. Table 3.27 shows the allocation of categories in accordance with the value obtained in the questionnaire carried out in the Cadrete experience.

**Table 3.27** Allocation of categories for indicators that are questions in the questionnaire carried out in Cadrete

Values	Categories
8-10	VG
6-8	G
4-6	A
2-4	B
0-2	VB

b) The attributes Control (AT1) and Freedom (AT4), whose indicators were not questions in the Cadrete questionnaire, were categorized in the following way:

- Control (AT1): it is considered that, for any e-Participation experience, the assignation of categories will be (see Table 3.28): i) *Very Good*, if the weight that the citizen has in the final decision is higher than 50%; ii) *Good*, if the weight that the citizen has in the final decision is 50%, iii) *Average*, if the weight that the citizen has in the final decision is between 25% and 50%; iv) *Bad*, if the weight that the citizen has in the final decision is less than 25% and more than 5%, and v) *Very Bad*, if the weight that the citizen has in the final decision is lower than 5%.

**Table 3.28.** Categories for the attribute *Control*

Weights	Categories
> 50% citizens < 50% politicians	Very Good
50 % citizens 50% politicians	Good
Between 25% and 50% citizens	Average
<25% and >5% citizens	Bad
<5% citizens	Very Bad

- Freedom (AT4): Table 3.29 shows the categories assigned to the attribute *Freedom* according to the percentage of censored messages during the development of the e-Participation experience.

**Table 3.29.** Categories for the attribute *Control*

% Censored messages	Categories
0%-20%	Very Good
20%-40%	Good
40%-60%	Average
60%-80%	Bad
80%-100%	Very Bad

The three following tables show, depending on the value obtained in their corresponding indicators, the category assigned to the attributes of each of the three criteria.

**Table 3.30.** Categories for the indicators of effectiveness

CRITERION: EFFECTIVENESS				
ATTRIBUTES	CADRETE INDICATORS	CADRETE VALUE	CATEGORY	
P E O P L E	CONTROL (CO-DECISION)	% assigned to citizens to decide a policy/decision Politicians: 40%; Citizens: 44%; Associations: 16%	VG	
	PARTICIPATION (CO- CREACCION)	An experience like this one has allowed me to feel involved in political decision making	Average: 6.68 (1-10)	7.246 (G)
		I consider that this is a very important opportunity to give my opinion	Average: 8.05 (1-10)	
		I am interested in participating in the planning of cultural and sports activities	Average: 7.41 (1-10)	
		I would participate again in an experience like this one	Average: 8.73 (1-10)	
		The system of discussion has allowed me to know others' opinions and share my own	Average: 5.36 (1-10)	
	LEARNING (FORMATION)	I have learnt a lot from this experience	Average: 7.14 (1-10)	7.14 (G)
FREEDOM (TOLERANCE)	% censored messages; % ideological intransigent messages	0%	VG	
S O C I E T Y	REPRESENTATION	With the current system of citizen participation, the representatives defend my interests	Average: 5.45 (1-10)	5.45 (A)
	COHESION	Other municipalities should incorporate this type of citizen participation	Average: 8.41 (1-10)	8.41 (VG)
	EQUITY	The Administration informs society about the existing mechanisms of citizen participation	Average: 5.45 (1-10)	5.45 (A)
	SOCIAL WISDOM	This citizen participation initiative contributes to create a better society	Average: 7.73 (1-10)	7.73 (G)

**Table 3.31.** Categories for the indicators of efficacy

<b>CRITERION: EFFICACY</b>			
<b>ATTRIBUTES</b>	<b>CADRETE INDICATORS</b>	<b>CADRETE VALUE</b>	<b>CATEGORY</b>
INFORMATION	The Administration informs society about the existing mechanisms of citizen participation	Average: 5 (0-10)	<b>4.85 (A)</b>
	The Administration informs society about the decisions taken	Average: 4.7 (0-10)	
COMMUNICATION	Political powers take citizens' opinions into account for the design of public policies	Average: 5 (0-10)	<b>5 (A)</b>
DECISION	The citizen has weight in political decision making	Average: 5.15 (0-10)	<b>5.15 (A)</b>
EXPECTATIONS	The citizen should participate in the design of public policies	Average: 7.5 (0-10)	<b>7.5 (G)</b>
	The citizen should decide together with the elected representatives the design of public policies	Average: 7.15 (0-10)	

**Table 3.32.** Categories for the indicators of efficiency

<b>CRITERION: EFFICIENCY</b>			
<b>ATTRIBUTES</b>	<b>CADRETE INDICATORS</b>	<b>CADRETE VALUE</b>	<b>CATEGORY</b>
System Quality	In general, I liked the design of the software application	Average: 5.8 (0-10)	<b>5.875 (A)</b>
	In general, I am satisfied with the computer application used	Average: 5.95 (0-10)	
<b>ATTRIBUTES</b>	<b>CADRETE INDICATORS</b>	<b>CADRETE VALUE</b>	<b>CATEGORIE</b>
Information Quality	In general, I am satisfied with the information that I received	Average: 6.9 (0-10)	<b>6.9 (G)</b>
<b>ATTRIBUTES</b>	<b>CADRETE INDICATORS</b>	<b>CADRETE VALUE</b>	<b>CATEGORIE</b>
Service Quality	In general, I am satisfied with the help of the support personnel	Average: 8.5 (0-10)	<b>8.5 (VG)</b>

After categorizing each of the attributes, we calculate the scores of the alternative under study (the Cadrete experience) (see Table 3.33).

**Table 3.33.** Scores of the Cadrete experience

<b>Global Weights</b>	<b>EFFECTIVENESS</b>								<b>EFFICACY</b>				<b>EFFICIENCY</b>			
	0.075	0.129	0.042	0.034	0.042	0.04	0.073	0.066	0.063	0.075	0.078	0.084	0.06	0.084	0.056	
<b>CATEGORIES/ATTRIBUTES</b>	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	
VG	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
G	0.439	0.543	0.486	0.543	0.439	0.543	0.543	0.439	0.543	0.439	0.439	0.486	0.486	0.439	0.543	
A	0.215	0.323	0.207	0.323	0.215	0.323	0.323	0.215	0.323	0.215	0.215	0.207	0.207	0.215	0.323	
B	0.095	0.143	0.108	0.143	0.095	0.143	0.143	0.095	0.143	0.095	0.095	0.108	0.108	0.095	0.143	
VB	0.056	0.08	0.061	0.08	0.056	0.08	0.08	0.056	0.08	0.056	0.056	0.061	0.061	0.056	0.08	
<b>ALTERNATIVE/ATTRIBUTES</b>	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	<b>Scoring</b>
Cadrete's experience	0.076	0.070	0.02	0.034	0.009	0.04	0.023	0.029	0.02	0.016	0.017	0.041	0.012	0.037	0.056	<b>0.5</b>

Taking the evaluation thresholds established in Section 3.11.5 (Table 3.26) as our reference value, the Cadrete experience can be evaluated as Good (G) because its score (0.5) is within the range of values 0.4-0.7.

The e-Participation initiative carried out in Cadrete is a pilot experience that has served to establish an approximation to the application of the EF3-framework. In future research, we hope to apply the EF3-framework to other e-Participation experiences in order to polish and improve it.

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# **CHAPTER 4:**

## **SOCIAL-ECONOMIC APPROACH TO E-COGNOCRACY**

### **4.1 INTRODUCTION**

As has already been mentioned during this thesis, since the concept of e-Government appeared, its evolution has led to the search for multiple attempts at modernization and innovation in the field of public management (Jaeger, 2003 and Wimmer, 2002). The activities of the public sector in the last years have focused, among other things, on citizen involvement in the political process through e-Participation.

The presence of the citizenry in institutional environments in which the management and design of public policies are defined and specified introduces a capacity of control that helps to reduce one of the fundamental imbalances in the relations between the State and civil society. In effect, citizen participation not only enables citizens to propose initiatives, carry out consultations, improve their level of information, and participate in certain decision processes but also to control and monitor institutional activity.

All these participative experiences and processes, in which the citizen is directly involved, have a clear impact on material, social and economic questions. The analysis

of the economic and social component of an e-Participation experience is considered fundamental and necessary in order to be able to study its final impact on society.

Taking into account the great efforts of public administrations to maintain a high degree of transparency in the implementation of e-Government services projects, they justify their budgets through studies that describe comparative analyses of cost information between the traditional way of serving citizens and the IT-based solutions. Nevertheless, due to the lack of established methodologies for calculating the costs and assessing the benefits of implementing e-Government services, these studies often contain analyses that do not reflect the reality of the costs (Hadzilias, 2005).

Moreover, in accordance with new social requirements and with the properties of transparency and accountability recommended for any process financed through public funds, as habitually occurs in e-Participation experiences, the public powers have to take decisions as to where to invest resources. An economic-social analysis is a useful tool to evaluate and study the value created by the implantation of projects and initiatives and can serve as a guide in public decisions to channel resources towards the experiences that provide greater net benefit to society (Pérez Espés et al., 2012, 2013).

In this chapter, we carry out an analysis, in monetary terms, of the economic and social aspects of the implementation and development of an e-Participation experience based on e-Cognocracy (the Cadrete case), using an advanced management tool called Social Return on Investment (SROI). This analysis allows us, through the comparison of the economic and social benefits with the investment made, to obtain a global vision of the true added value that e-Participation initiatives provide for society.

## **4.2 ECONOMIC-SOCIAL VALUATION OF THE E-PARTICIPATION EXPERIENCES**

This section presents a review of the literature on the economic and social valuation of projects and initiatives carried out by the government and the possible methodologies that can be applied to evaluate an e-Participation experience in monetary terms.

#### **4.2.1 Background**

The work of Matusuda and others (1998) evaluates, through AHP, the importance of carrying out social programs that contribute to the social welfare of elderly people belonging to the community of Fukuoka (Japón).

Bhatnagar (2003), as well as identifying the goals and objectives to be achieved in different initiatives of electronic government, establishes how to attain the objectives fixed so that they have an impact. To do so, the author focuses on a compilation of various examples of e-Government applications in different countries including Mexico, India and the Philippines. To achieve social impact, the goals proposed by Bhatnagar were: i) to increase transparency; ii) to reduce administrative corruption; iii) to improve service delivery; and iv) empowerment. At the same time, he also established 4 other goals or objectives to achieve economic impact: i) simplification of administrative processes; ii) reduction of administrative taxes for businesses; iii) increase of incomes; and iv) reduction of costs and budgetary savings.

Gupta and Jana (2003) study the evaluation of e-Government through a framework that suggests choosing a strategy to measure the tangible and intangible benefits of the application of e-Government initiatives in society.

Hadzilas (2005) proposes a structured framework for calculating the cost of e-Government services, based on the complementary application of the IDEF0 modelling tool and the Activity-Based Costing technique. The motivation for his research effort was derived from the need to use an alternative method for the annual cost calculation of the TAXISnet e-Government services, since the relevant report published by the Greek Ministry of Finance in 2003 was based on traditional accounting approaches. The first step of his proposed methodology is the IDEF0-supported identification of the activities corresponding to the e-Government services and their initial classification as value-added or non value-added. Then, data are collected about cost elements and their activities) using Activity-Based Costing.

Jens Loff (Loff, 2011) studies, using cost-benefit analysis (CBA), whether it is profitable, both in economic and social terms, to implement a participation project. This work was presented for the European Public Sector Award (EPSA). Another example that uses CBA as its evaluation tool is that of Fernando Cuenin (Cuenin, 2009). The

main aim of this study was to give a general idea about how the economic analysis of projects could aid the design, monitoring and evaluation of operations, focusing on the particular case of neighborhood improvement programs.

#### 4.2.2 Methodologies

This section describes different tools that allow the evaluation of a project or an initiative in monetary terms.

The numerous references in the literature lead us to the conclusion that *Cost-Benefit Analysis (CBA)*, *Multi-criteria Decision-Making (MCDM) Techniques*, *Icam DEFinition for Function Modeling (IDEFo)*, *Activity-based costing (ABC)* and *Social Return on Investment (SROI)* are among the most widely-used tools in decision making, especially in the public sector.

Cost-Benefit Analysis is one of the methods most used in the sphere of Public Administration to analyze its own behavior. CBA is, basically, the rationalization of a daily practice: weighing up the advantages and disadvantages of any decision or alternative, whether by itself or in comparison with others (Azqueta, 2007). CBA is a tool that permits the evaluation of the costs and benefits of a project (program, intervention or political measure) with the aim of determining whether the project is desirable from the social welfare point of view and, if it is, to what extent. To do so, both the costs and the benefits must be quantified and expressed in monetary units. CBA is used in *ex ante* evaluations as a tool to select from among alternative projects or to decide whether the implementation of a particular project is socially desirable. It can also be used *ex post* to quantify the net social value of a project previously carried out. This type of analysis has already been employed in the evaluation of citizen participation experiences (Azqueta, 2007).

On occasions, the analyst is faced with a double-edged problem that impedes the use of CBA (Azqueta, 2007): i) some of the costs and benefits identified cannot be reduced to the number previously established and ii) the decision maker, or some of the social groups that take part in the process of collective decision, consider that this reduction should not be carried out, that is, they reject the use.

In both cases, the analyst is deprived of the possibility of reducing all the costs and benefits to a single figure that permits direct comparison. To resolve this type of

problem, one of the tools proposed are the Multi-criteria Decision-Making (MCDM) Techniques. The origin of these techniques is the same as the conventional CBA: the necessity of maximizing a function that depends on a series of well-specified objectives but with the difference that, now, they can present conflicts among themselves (Pérez Espés et al., 2013). The methods of multi-criteria evaluation and decision-making consist of selecting, from among a set of feasible alternatives, the optimization with various simultaneous objective functions and just one decision maker, and procedures of rational and consistent evaluation (Martínez and Escudey, 1998).

IDEF0<sup>39</sup>, a compound acronym (*Icam DEFinition for Function Modeling*, where 'ICAM' is an acronym for *Integrated Computer Aided Manufacturing*), is a function modeling methodology for describing manufacturing functions which offers a functional modeling language for the analysis, development, reengineering, and integration of information systems, business processes, or software engineering analysis<sup>40</sup>. IDEFo was developed by the US Air Force under its ICAM program. The key principle of IDEFo is that complex systems can be explained in terms of the activities performed in the system and in such a way as to present details progressively through a hierarchical decomposition. This means that a model begins with one diagram which describes, generally, between 2 and 7 essential activities in the system. These activities are then decomposed to provide further detail until the required definition for the system is reached. Diagrams are linked together using a code, so the reader can rapidly discover exactly what detail is of interest. Also, because the diagrams have a set method for displaying inputs and outputs the reader can read in the diagram exactly what is important for whatever analysis is being conducted. A set of diagrams for a particular system coupled with a text explaining the activity is usually called a model.

Another evaluation method is that of Activity Based Costing (ABC). This method was first clearly defined in 1987 by Kaplan, Robert S. and W. Bruns as a chapter in their book *Accounting and Management: A Field Study Perspective* (Kaplan et al., 1987). According to CIMA<sup>41</sup> (Chartered Institute of Management Accountants) (CIMA,

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<sup>39</sup> <http://en.wikipedia.org/wiki/IDEF0>

<sup>40</sup> *Systems Engineering Fundamentals*. Defense Acquisition University Press, 2001.

<sup>41</sup> [http://www.cimaglobal.com/Documents/ImportedDocuments/cid\\_tg\\_activity\\_based\\_costing\\_nov08.pdf.pdf](http://www.cimaglobal.com/Documents/ImportedDocuments/cid_tg_activity_based_costing_nov08.pdf.pdf)

2005), ABC can be defined as an approach to the costing and monitoring of activities which involves tracing resource consumption and costing final outputs. Resources are assigned to activities, and activities to cost objects based on consumption estimates. The latter utilize cost drivers to attach activity costs to outputs.

Lastly, it is necessary to refer to one of the methods most employed in public decision making, Social Return on Investment (SROI), which is dealt with in detail in the next section.

### **4.3 SOCIAL RETURN ON INVESTMENT<sup>42</sup>**

#### **4.3.1 Concept**

Social Return on Investment is a methodology created in the mid-1990s in San Francisco and intended to evaluate investments in social organizations. It was later revised in 2000 by New Economics Foundation with the collaboration of public administrations in the United Kingdom.

SROI is a participative approach that permits the monetary calculation of the value of a wide range of results, whether they have a market value or not. It is a tool with which both the managers and the investors in a project can take decisions based on the optimization of the social and environmental impacts of the project.

It is a method that adds principles of measurement of extra-financial value with respect to the resources invested, that is, the social and environmental value that, at present, is not reflected in conventional financial accounts. SROI also incorporates the concept of return, which, in financial terms, simply refers to the benefits received as a result of an investment.

The use of this tool illustrates how an organization, program, project, initiative, etc., creates value and a coefficient that indicates how much total value in euros is created for each euro invested.

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<sup>42</sup> <http://www.thesroinetwork.org/sroi-analysis/the-sroi-guide>

This SROI coefficient is a comparison between the value generated by an initiative and the investment necessary to achieve this impact. SROI seeks more than to obtain a simple number because the method describes the process for reaching the final ratio and contextualizes the information to permit its correct interpretation. Furthermore, it presents a framework to explore the social and environmental impacts of an organization in which monetization plays an important, but not exclusive, role.

There are two types of SROI analysis: i) evaluation, that is carried out a posteriori and on the basis of the real results already obtained (measurement of the impact of finished projects) and ii) forecasting, that predicts the social value that will be created if the activities achieve the foreseen results (especially useful in the planning stages of an initiative). The two types of SROI can be combined to include both the results already attained and future ones.

#### **4.3.2 Principles**

- To involve interest groups (stakeholders)

Interest groups are people or organizations that have an influence on the project or that experience change as a result of the project. This principle means that they must be consulted through the SROI process, especially in the identification of the results of the project. For social projects, this implies consulting, on the one hand, the beneficiaries about the changes they experienced or what they seek from a project and, on the other hand, consulting the investors and other important partners about the results they seek.

- To understand what changes and how

This principle implies that the theory of change must be presented and supported, that is, how the activities of a project are going to produce outputs and how the outputs are going to produce results must be explained logically. In SROI, this principle also implies that you must identify and understand both positive and negative changes as well as both intended and unintended ones.

- To evaluate what is important

This principle means that we must look for proxies or financial substitutes to evaluate the benefits of our projects. There are many benefits that are not

recognized by traditional markets and, thus, are not evaluated. One of the challenges during SROI analyses is to identify proxies that can represent and give a value to these benefits.

- To include substantial information and evidence

This principle means that we must include all the information and evidence necessary so that the interest groups and others that read our SROI analysis can understand our project and its impacts. This principle also means that we must abandon any information that is irrelevant or not important.

- To attribute fairly

This principle implies that we must not exaggerate the benefits of our projects or their value. We must identify honestly which of the changes observed are due to our project and which, in contrast, would have occurred anyway or are attributable to other factors or actors. And we must select financial proxies that are justifiable, not only those that provide us with the highest figure.

- To be transparent

This principle implies that we must clearly identify and explain the different suppositions and decisions that we use at each stage of the elaboration of our SROI, including the identification of control groups, changes, indicators, the sources and the methods of collecting information, and the decisions about attribution.

- To verify the result

This principle implies independently verifying as far as possible the results of a SROI. There is much subjectivity in a SROI analysis and an independent review may be useful to confirm that the suppositions and decisions used are reasonable. The SROI Network International recommends an independent review by qualified evaluators and a panel to confirm that the analysis followed the principles of SROI and, thus, complied with a standard of quality. This could give greater credibility to your SROI if your organization is going to use it externally. Nevertheless, it must be borne in mind that an external review means additional costs. If that is not feasible for your organization, another option is to have it reviewed by a more local

entity or through a process of verification with your interest groups to obtain feedback and to reach a consensus on the results.

#### **4.3.3 Calculation**

The SROI methodology is made up of ten steps:

1. Determine the scope of the SROI analysis itself.

The aspects to consider in order to determine the scope are:

- Purpose

It is necessary to clarify the purpose of the analysis, the timing, motivation, planning and strategy to follow, necessary financing, use of the report, and any other aspect that might help to adjust the goal and the basic requirements.

- Public/receivers

The receivers of our analysis must be considered: project and organization personnel, public administration, manager of the firm, social organisms, beneficiaries, the general public, etc.

- Context

The situation and the circumstances surrounding the project must also be taken into account. It is necessary to check how the project fits in with the activities of the firm and which them affects our analysis or must be taken into account when carrying it out.

- Resources

The SROI analysis must be dimensioned bearing in mind the available human resources, but also the available time and financing. The more variables that we include in our analysis, and the more ambitious it is, the greater the costs and resources that will be necessary.

- Analysis team

Completing the analysis of resources, it must be clarified whether the personnel that will carry out the analysis form part of the firm or whether it is necessary to outsource or bring in external help. The training of the team is important and knowledge or experience in finance and accounting, among other areas, will be

required. Furthermore, when the analysis is carried out by organization personnel, the specific time they will dedicate to it must be considered.

- Activities and projects to include

It is necessary to decide what activities to include or not, which of them exactly make up the project we want to measure. It is recommended to begin the analysis with a limited number of activities in a project of reduced dimensions to facilitate familiarization with the methodology of the analysis. What the analysis is trying to measure should also be clearly described.

The SROI must analyze and measure information that is relevant for the receiver of the analysis. Its conclusions must also be relevant for the users of the report.

- Range of time to analyze

The SROI analysis is often carried out annually, corresponding to the period of annual financial accounting, although other periods of analysis can be established in accordance with specific necessities. SROI can be proposed for future projects (prediction or forecasting SROI) or to review a project about a situation that has already occurred (evaluation SROI).

## 2. Identify and incorporate the actors involved

Having determined the scope of the analysis, the next step is to identify and incorporate the actors involved. The actors involved are defined as people or organizations that experience change and affect the activity that has to do with the SROI.

To identify the actors involved, it is necessary to list all those that may affect or be affected by the activities within the scope of the project, whether the change or result be positive or negative, foreseeable or accidental. In the SROI analysis, we are mainly concerned with discovering how much value has been created or destroyed and for whom.

The establishment of the actors involved consists of identifying who have been involved in one way or another in the project by having experienced a material change as a result of its activities or by having promoted that change.

To decide which actors should be incorporated, a process of integration must be established with the possible factors to determine whether to include them or not depending on their connection with the project. This must be an interactive and progressive process through which, little by little, we obtain a better view of the project and its actors and we can refine the group of actors that we are really interested in including. The interaction with potential actors will reveal new ways of incorporating other relevant actors.

There are various methods for incorporating the actors and interacting with them: meetings, telephone calls, panels, questionnaires. The possibilities are many and varied depending on the profile in each case. The incorporation of actors must be considered an iterative process: in the early stages, the sample may be small; new actors can be incorporated when appropriate.

In this integration with the actors, not only positive contributions or impacts should be considered but also negative results or collateral effects that may have been obtained and that may also be relevant in the SROI evaluation.

It is necessary to make sure that the results of the actors involved are related to the activities carried out in our experience or project and that the choice of groups of actors involved does not hide significant differences.

### 3. Elaborate an impact map

The following step is the identification of the changes that occur for each actor involved. To do this, it will be necessary to elaborate an impact map using the information we obtain from the actors involved. The activities are carried out through a series of inputs and the obtaining of outputs and results. The outputs of a project are the products or services generated by the carrying out of the activities while the results are changes in social, environmental and economic conditions generated by the outputs.

There are several steps to complete in an impact map:

- Present objectives

It is necessary to present the objectives and the scope of the project.

- Identify and evaluate inputs

This means economically quantifying the financial value of the inputs that the different actors provide and that are used during the life of the project or initiative. They may be of different types but their economic evaluation must be incorporated. Some are of an economic nature: a subsidy, a contract, etc. Others are costs or related to time. In all cases, it is necessary to evaluate them and incorporate them into the analysis. In the absence of particular data or when an economic forecast is being prepared an estimation will be established and will be justified in the report.

- Identify and evaluate outputs

Outputs are the quantitative summary of an activity.

- Clarify the results

Care must be taken not to confuse outputs with results. After identifying the results, they must be related unequivocally to the actors involved.

#### 4. Elaborate indicators for the results

The next step is the elaboration of indicators to measure the results.

The indicators are quantitative and qualitative references to show advances in the performance of an activity or in the obtaining of outputs and outcomes. They allow us to know whether a change has occurred and in what measure it has done so. This phase is fundamental in the measurement of the SROI. The indicators must be capable of: i) providing the base for monitoring and evaluating and ii) showing clearly the relevant advances made.

This phase consists of three steps:

- a) Development of the indicators of results

The objective of this step is to clarify one or two indicators for each of the results of our project. The best way of tackling this objective is to involve the interest groups because they are the ones who can best inform us of the changes they have experienced during the project.

The indicators can be objective or subjective. Although the ideal thing would be to explain the results of our project with only objective indicators, on many

occasions, this is not possible. That is no reason for rejecting subjective indicators: we will incorporate them into the analysis and try to compensate for the risks of using them by seeking the support of objective indicators.

Having selected the indicators, we must check that they are significant for the interest groups and for the scope of the analysis, which implies being able to measure them with the framework of the scope and the resources that we have previously established.

If we are going to need to measure the indicators in the future, either because we are carrying out a predictive SROI or because one of the interest groups generates results at a later time, we have to guarantee that we will be able to do so reasonably and that we will keep in contact with the interest groups in order to be able to collect the necessary information.

b) Collection of information about the results

Now we need to collect information about the indicators, information that may be available or that we may have to collect ourselves.

The organization that is carrying out the project or initiative that we are evaluating will have quite a lot of useful information so it will be the first source to which we will turn. There are other organizations or organisms that have information that we need, including universities, research bodies, consulting or market analysis firms, public organisms, etc.

The people directly involved in the project are a source of primary data and, to collect this data, we can make use of techniques such as interviews, questionnaires, stakeholders, seminars, etc.

Collecting information is difficult and, normally, we will not be able to gather the perfect quantity of information with the maximum quality. We will have to make do with the optimum information. At this point, it is sometimes a good idea to go back to phase 1 and redefine the scope of our analysis in accordance with the resources available and the priorities of the organization.

c) Estimation of the duration of the results

Not all the results of the project have the same duration; some of them correspond to the implementation of the project while others, like the creation of businesses and jobs should last beyond the project. Indeed, the sustainability of the results of our projects is something we should all look for. Thus, if the project continues to generate results after it has finished, it is necessary to incorporate their value into the SROI analysis. The time during which a result continues to generate benefits is called the duration of the result.

We need to estimate the duration of each of the results of the project. The ideal thing would be to ask each of the people affected by the project how long they have experienced the benefits derived from it. But, as this is not normally possible, the most operative alternative is to use the answers of a reference group.

5. Monetize the non-financial results whenever possible

We need to quantify the value of the results in order to be able to reflect this value and transmit the importance of a result in comparison to others. The most common way of quantifying the value of something is to express it in monetary units. Any monetary value derives from the intersection of supply and demand and is, therefore, subjective.

In the case of the social value, the process is the same, although there are no organized markets in which to find the supply and demand and no mechanism for discovering the prices. So, to be able to estimate the social value of goods and services, we have to use financial proxies.

The different interest groups will not have the same perceptions about the value they obtain from the different goods and services. Estimating this value through the use of financial proxies, and combining these evaluations, we can reach an estimation of the total social value generated by an intervention. This value reflects the recognition of the different agents affected by the project, that is, the opinion of the different interest groups.

To value market-less goods, economics has, basically, the following techniques:

- Opportunity cost:

This method calculates the value of the opportunities rejected when a resource is used to obtain a certain product or service instead of another. It assumes that the value is equivalent, at least, to the value of the best alternative rejected when obtaining the good or service desired.

- Method of replacement costs:

Also called the method of defensive behavior, the underlying idea is very simple: in response to a change in environmental quality, for example, higher levels of urban noise due to an increase in road traffic, people will incur costs destined to mitigate this effect -for instance, double-glazing their windows- and will thus avoid the reduction in their level of well-being caused by the greater noise. Thus, the value of an improvement in environmental quality can be implied by a reduction of so-called defensive spending. In sum, it means finding out the cost of returning the environment to its original level.

- Hedonic pricing model

This model breaks down the price of a private (market) good according to various characteristics. These characteristics have an implicit price, the sum of which determines, to a certain extent, the price of the market good observed. For instance, the price of a house can be determined by the aggregation of the implicit prices of its characteristics and of those of the surroundings in which it is located. Employing econometric procedures, the weights of the variables that determine the final price of the house are calculated (for example, surface area of the house and grounds, typology, number of bedrooms, and of bathrooms, age, distance from the city center, level of atmospheric pollution and beauty of the scenery) and, under certain assumptions, the prices of these characteristics are estimated.

- Travel cost

The method or model called travel cost is mainly applied to the social evaluation of a particular space of environmental interest or of a recreational nature but it

can be extended to other goods. Under certain assumptions, it provides details of the demand function of that space and, consequently, the consumer surplus. In its most direct formulation, the idea of the method of travel cost and the procedure for applying it are very simple. Although the entrance to a space of natural interest be free, the cost of access is, generally, more than zero because it must include, at least, the cost of the journey. In general, the nearer one lives to the space whose enjoyment we wish to evaluate, the lower the cost and, consequently, the greater the relative number of visitors. In this way, the demand function between the number of visitors (quantity) and the travel cost (price) can be determined.

- **Contingent valuation**

The contingent valuation method aims to estimate an individual's maximum willingness to pay for the provision or improvement of a non-market good or, alternatively, the minimum willingness to be compensated for the loss or decrease of the enjoyment of the same good. The use of one or other modality depends, to a large extent, on the definition of the property rights on the good that is to be valued. Contingent valuation is considered a form of direct estimation because a sample of the population are directly asked how much they value a certain environmental good. The method of contingent valuation tries to measure, in monetary terms, changes in the level of people's well-being due to an increase or decrease of the quantity or quality of a good. This measure, in monetary units, is usually expressed in terms of the maximum quantity that a person would pay for a good, that is, what is referred to by the expression willingness to pay. If the goods have no direct monetary cost for the consumer, this willingness to pay for the good is the equivalent of the benefit that the consumer obtains.

6. Separate the impact of the result

In this step, the impact of the project is established. There are various ways of evaluating whether the results analyzed are really derived from the project or not. These methods aim to evaluate what quantity of the result would have been produced even if the project had never been carried out and what proportion is due exclusively to the

activities of which the project or initiative is made up. The impacts, therefore, are the results directly attributable to the organization. To arrive at this concept, we must filter the changes, eliminating whatever has not been produced by our organization. In other words, when carrying out an SROI analysis, only what the organization itself has created can be claimed as an impact. An erroneous evaluation of the impact can lead to investment in initiatives that do not work well or, at least, as well as they should. In this stage, we will analyze the filtering coefficients of the social and environmental impact, namely: deadweight, displacement, attribution and drop off. After calculating these four coefficients, the impact is calculated.

- **Deadweight**

The deadweight tries to quantify to what extent the result obtained would have been achieved even if the project that is being evaluated had not been carried out. It is expressed as a percentage and indicates the proportion of the result that is not due to the initiative developed.

To be able to calculate this coefficient, it is necessary to establish comparisons with a group of reference. The perfect comparison would be with an identical group of people that had not been affected by the intervention, but this is practically impossible. Therefore, the deadweight will always be an estimation that will be better, the more similar the group of reference to the group affected by the project.

The groups of reference of the project are an important source of information when calculating the deadweight because they can inform us about other initiatives that are affecting them and to what degree. Questionnaires and databases from public and private organisms, as well as those from the Instituto Nacional de Estadística, can guide us on this point.

Analyzing the trend of the group of reference over time can allow us to identify whether there are any differences before and after the activity, which can be indicative of the influence of the activity on the result.

One of the advantages of calculating this coefficient is that the groups of interest give a higher social value to the results in cases in which a very low deadweight is obtained.

The greater the deadweight, the lower the contribution of our initiative to the result. Effectively, the fact that we assign a high deadweight to one of the results should warn us to check whether this result is really significant for our analysis. The deadweight is measured, as we stated above, as a percentage that is later discounted from the total of the result.

- Displacement

Displacement measures the percentage of the change that has been displaced to other changes. For example, if our target group (let's say socially excluded people who we are trying to train in order to get a job) gain employment at the expense of displacing another potential worker, the quantification of this circumstance will have to be subtracted and will reduce the impact of our initiative.

This coefficient is not applied in all SROI analyses. In fact, many practical cases do not take it into account but it is important to be aware that this possibility exists. It is necessary to apply it in cases in which the fact of having achieved a result is at the expense of not achieving another.

- Attribution

Attribution measures the percentage of changes that is not attributable to the management of the organization. For example, if our organization receives aid from a Foundation to recruit participants for our training program, this circumstance should be subtracted from the credit side of the change. It is, therefore, necessary to deduct the impact of the percentage of the result that has been caused by the contribution of other organizations or people from the calculation.

It is important to bear in mind that it is not possible to get an exact value for this coefficient because, on many occasions, the possible external contribution that the project may have is not very clear. This stage aims, above all, to raise the project managers' awareness of the fact that their activity may not be the only one that contributes to the change observed.

To estimate this filter coefficient, we can build on our experience, consulting the groups of interest and/or consulting other organizations that we think may be contributing to the result and in which, therefore, there may be attribution.

As can be seen, the estimation of attribution is very complicated so it is important not to commit some quite common mistakes. First, the reason for calculating this coefficient must be remembered, namely, to help the organization to manage the change produced as correctly as possible. Not much time need be dedicated to this calculation but how the estimation has been constructed must be well explained. Second, we must be careful not to attribute results to organizations or people who are paid with money that comes from the investments because their contribution is already considered in the investment. Finally, it is necessary to take into account that it is possible that, when calculating the deadweight, we included part of the attribution in that percentage and we must not doubly penalize this result.

- Drop off

The drop off is the deterioration of a change over time. It can occur with changes that last for more than one year. For example, if, in a training program, the participants that successfully finish it abandon a future employment or, if, as time passes, not enough computers are obtained to train the students, this concept must be reflected when calculating the impact.

This coefficient analyzes how long the results last. It is logical to think that, in the years after the end of the project, the quantity of result obtained through the project will diminish, so the attribution of the project will also fall. This decrease is only calculated for results that last more than a year.

Once again, to be able to calculate this coefficient, it is necessary to carry out estimations and, to do so, in the absence of information, experts recommend using a standardized proxy. Normally, the procedure for calculating it is to reduce the level of the result by a fixed percentage at the end of each year.

All the filtering coefficients are calculated as a percentage and these proportions of the result will be deducted from the total quantity of the result. Having

obtained these four percentages, we can proceed to calculate the impact of each of the results.

7. Valuation of the inputs

Through this step, we elaborate a budget with all its balancing entries. Thus, we will evaluate the inputs of all the groups of interest of the project, both monetary and non-monetary.

When valuating inputs that are used in various projects at the same time, it is necessary to estimate the percentages corresponding to the project included in our SROI.

In the case of inputs in kind, and in the interest of the principle of transparency that governs SROI, it is necessary to select the valuation method applied.

8. Calculate the current value of the investment and of the returns

This stage consists of adding up all the changes, subtracting from them any negative impacts there might be and comparing the result with the investment. To do this, we must calculate the current value of the investment and of the returns. We must, then, update the flows and, for this, we need to estimate:

- Rates of growth or decline of the flows, that is, whether the impacts grow or not, when adjusted for inflation or any other parameter. These rates are usually the product of the research or of conversations with the groups of interest.
- Discount Rate: the discount rate is of capital importance in SROI analyses because, depending on whether we use one rate or another, we will obtain very different results. So, it is always necessary to give reasons for applying a certain rate. The discount rate is defined as the opportunity cost of the capital employed in the project; to be acceptable, the project must generate a return at least equal to that available in another investment. The higher the discount rate mayor, the easier it is to distinguish the benefits and costs obtained in the long run compared to a project that generates benefits in the short run.

Investments in public projects should use the risk-free interest rate as discount rate. However, as SROI calculates the social and not the financial return on the investment, it is necessary to take into account factors such as the degree of correlation that exists between the social impacts expected and the activities of the organization and the capital cost that would be used to create the social benefits that the firm generates.

For other organizations, we suggest using the capital cost of the organization, if it is known and, if this is not the case, to carry out an estimation.

9. Calculate the ratio

In this step, we proceed to calculate the SROI ratio (or quotient). It is only necessary to divide the current value of the social return by the current value of the investment in the project.

Current Value of the Social Return / Current Value of the Investment = Social Return On Investment

10. Report, validation, follow up and use

• Closing the report

With all the information obtained and processed, we proceed to complete the SROI report including, as we have said, not only the result of the process of analysis itself but also any assumption or estimation that has been contemplated. Greater detail will always be beneficial for a better understanding of our study.

• Validation

It is important to check our work with the opinion of experts or, at least, with the actors involved to make sure of its correctness.

• Follow up

It is important to plan the actions necessary to collect the data that are required to evaluate the scope of the social returns of the project and to have their evaluation permanently updated.

In many cases, this requires adequate planning that involves the actors: it is, thus, a phase that must be carefully prepared.

It is also important when we are planning future and prospective analyses.

The SROI analysis itself gives us important information for taking decisions in the future about where it is more interesting to use the financing in light of the value that is generated. It will give us clues about where it is interesting to incorporate resources so as to optimize the value generated from the resources used.

The analysis can, therefore, help in the future planning of projects and provide information that is relevant for making decisions about the future course of the organization.

- Use, diffusion and promotion

As well as the use already mentioned for the planning of future actions, the diffusion of the results of our report can help the actors involved in taking decisions in their spheres of activity: better practice, benefits of this type of project, improvements in the target group, inputs for institutions and promoting organizations, etc.

#### **4.4 SOCIAL-ECONOMIC APPROACH TO E-COGNOCRACY**

This section addresses the social-economic approach to e-Cognocracy through a SROI analysis. First, the reasons for choosing Social Return On Investment as the methodology for the development of the economic-social approach are explained and, then, the SROI for our case of study, the Cadrete e-Participation experience, is carried out.

#### **4.4.1 Why SROI?<sup>43</sup>**

The SROI methodology has the greatest worldwide level of acceptance for the calculation of the impact of the triple dimension -social, environmental and economic-, containing all externalities, whether they have market value or not. SROI, as has been commented previously, is a participative approach that permits the capture, in monetary terms, of the value of a wide range of results, whether they have economic value or not. The effects derived from the implementation and development of an e-Participation experience are not only economic but, in most cases, social and environmental. The need to quantify, in monetary terms, the contribution of the whole participation process, as well as the value created, leads us to carry out a SROI analysis that will be useful in the sense that it generates relevant information for decision making.

Moreover, SROI helps us to understand, manage and communicate the social value that our work creates in a clear and consistent way for customers, beneficiaries and funders. It will bring out potential improvements to services and information systems. Because SROI is built on principles, it is very flexible. Different organizations create value in many different ways. A consistent approach to understanding and accounting for social value means that you can communicate clearly where and how you create value in a credible way.

All the above has led me to consider that SROI is one of the best methodologies to apply in our case of study.

#### **4.4.2 SROI analysis for the cadrete experience**

This section presents each of the steps carried out to calculate the SROI coefficient of the Cadrete initiative based on e-Cognocracy.

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<sup>43</sup> <http://www.thesroinetwork.org/117-home/all-regions/167-why-should-i-use-sroi10> (20 de julio 2014)

#### 4.4.2.1 Determining the scope

##### 1. Proposal

The objective of this analysis is to measure the impact that the Cadrete experience has had on society, as well as the value created by the practical application of this initiative.

This is an evaluation analysis because it is carried out *a posteriori* and is based on the real results obtained 4 years after putting the experience into practice.

##### 2. Public/Receivers

The receivers of our SROI analysis are all those to whom we must be held accountable (being, above all, transparent) for the project financed mainly by public funds:

- Citizens and society in general
- Financing entities: Council of Cadrete, Government of Aragón and the University of Zaragoza
- Promoter of the initiative: the Zaragoza Multi-criteria Decision Making Group.

This analysis is also addressed to the “science of research” to serve as a guide and to be improved in other experiences.

##### 3. Context

There are more and more e-Participation experiences carried out in society in which, among other things, citizen participation in public decision making is fomented. As a consequence, a need arises to measure the economic, social and environmental impact of these initiatives as well as the value added they generate.

##### 4. Resources

To carry out the SROI analysis, we had, as personnel resources, all the members of the Zaragoza Multi-criteria Decision Making Group. The expenditure arising from the carrying out of this report was financed by the GDMZ.

5. Analysis team

The personnel that carried out the SROI analysis are the members of the Zaragoza Multi-criteria Decision Making Group.

6. The range of activities to be included

The topic of the Cadrete experience was the design of cultural and sporting policies. There were two main objectives for the research group: the implementation of the experience and the validation of the methodological and technological tools; and the three objectives for the City Council: (i) that decisions on the budget assigned to the aforementioned policies would be conjointly made by the politicians and the citizenry; (ii) that citizens would be encouraged to involve themselves in the debate and take part in the decision making process; and iii) that the arguments that supported the decisions would be publicly disseminated.

The activities to be included in the SROI analysis are all those that were necessary for implementing the experience. Therefore, most of them coincide with the stages, grouped into 4 blocks, of the methodology followed by e-Cognocracy (Moreno-Jiménez et al., 2014):

- **Block 1: problem formulation**

*Stage 1: problem presentation.*

*Stage 2: problem setting.*

- **Block 2: problem resolution**

*Stage 3: identifying the actors, factors and alternatives.*

*Stage 4: problem modelling.*

*Stage 5: valuation I.*

*Stage 6: determination of initial positions.*

*Stage 7: citizen debate and discussion.*

*Stage 8: valuation II.*

*Stage 9: determination of the new positions.*

The inputs used in the development of Stage 10: *system behaviour analysis* have not been accounted for in this particular case (Cadrete experience) because this analysis was not carried out.

**Block 3: Knowledge extraction and democratization** includes Stages 11 (*assignment of messages to the alternatives and justification of positions*), 12 (*evaluation of individual and collective learning*), 13 (*identification of arguments that support the decisions*) y 14 (*extraction and diffusion of knowledge*). In this case, the inputs used have not been accounted for because the activities carried out in each of these stages were not necessary for the implementation and development of the e-Cognocracy initiative. This block analyzes and studies the results obtained after the execution of the experience.

- **Block 4: Evaluation and documentation of e-Cognocracy**

*Stage 15: Effectiveness of e-Cognocracy.*

*Stage 16: Documentation of the project.*

7. Time range to analyze

As indicated in Chapter 3 of this thesis, the Cadrete experience was carried out in 2010. This report was drawn up in 2014, but the period to be analyzed is of 1 year (from 2010-short term).

**4.4.2.2 Identification and incorporation of the actors involved**

The actors or groups of interest (stakeholders) that we have taken into account for carrying out the SROI analysis are all those directly affected by the experience: the municipal council, the citizens of Cadrete and its surroundings and the promoter of the experience, the GDMZ.

**4.4.2.3 Impact map**

Drawing up the impact map, basically consists of answering the following questions:

1. What does it contribute? (evaluation of the inputs of the experience)
2. What does it generate? (description of the outputs obtained from carrying out the initiative)

3. What does it change? (description and quantification, in monetary terms, of the results obtained in the experience)

The inputs used in the implementation and development of the experience are described in detail in Section 4.4 of this chapter.

Table 4.1 shows the outputs and outcomes obtained in the carrying out of the experience (by stakeholder group).

**Table 4.1.** Outputs and outcomes of the Cadrete experience

<b>STAKEHOLDERS</b>	<b>OUTPUTS</b>	<b>OUTCOMES</b>
COUNCIL	Assignment of the budget for cultural and sports activities	Knowledge of new e-Participation experiences Improvement of image through good practice Fostering of citizen participation and involvement
CITIZENS OF CADRETE	Casting vote in the participative process Posting of messages and comments on the discussion forum Giving opinion in the final questionnaire.	Knowledge of new e-Participation experiences Acquiring technological knowledge Social and individual learning through the discussion forum Satisfaction that their opinion is taken into account in decision making
CITIZENS FROM THE SURROUNDING AREA	Posting of messages and comments on the discussion forum	Social and individual learning through the discussion forum Acquiring technological knowledge
GDMZ	Number of tools necessary in the implementation of the experience (voting software, discussion forum)	Fostering of citizen participation and involvement Social Recognition Improvement of and increase in research lines

#### 4.4.2.4 Indicator for the results

Below, we explain the outcomes obtained in the process. *Citizen participation and involvement* are understood as the possibility of the citizen, association or, even the politician, being able to express and communicate their opinions. In this experience, participation makes itself evident in the existence of two participative activities enabled during the whole process: voting and debate/discussion. In the outcome of *image through good practice and social recognition*, we have considered the recognition obtained through prizes awarded and through being a pioneer experience in Aragón, as well as that obtained through publications, congresses and national and international conferences, all of which have meant that a municipality like Cadrete has become known. The *individual and social learning* and all the *acquired knowledge* through handling the software and computer tools of the experience have also been considered as outcomes. Citizen *satisfaction* has been classified as an outcome of this experience because it is considered that citizens feel better when their opinions are taken into account and can decide conjointly with politicians. The outcome referring to *future research lines* shows that the Cadrete experience has resulted in numerous publications, congresses, conferences etc.

Table 4.2 presents the indicators established to evaluate the outcomes.

**Table 4.2.** Indicators for the outcomes

STAKEHOLDERS	OUTCOMES	INDICATORS
COUNCIL	Knowledge of new e-Participation experiences	Time dedicated to learning the experience
	Improvement of image through good practice	Number of advertisements published, talks and lectures given, and certificates or prizes received
	Fostering of citizen participation and involvement	Number of people that participated and degree of involvement in the activities
CITIZENS OF CADRETE	Knowledge of new e-Participation experiences	Time dedicated to learning the experience
	Acquiring technological knowledge	Time dedicated to learning
	Social and individual learning through the discussion forum	Time dedicated to learning
GDMZ	Increase in the value of the methodology applied by the GDMZ	Number of tools created
	Social Recognition	Number of prize received Number of conferences New projects awarded

4.4.2.5 Quantification of the value of the results

This section presents the quantification, in monetary units, of the results through the use of financial proxies (see Table 4.3).

**Table 4.3.** Proxies for the indicators of outcomes

		<b>OUTCOMES</b>	<b>INDICATORS</b>	<b>PROXIES</b>	<b>Total € 115623.50</b>
<b>COUNCIL</b>	Knowledge of new e-Participation experiences	Time dedicated to learning the experience	Savings on the cost of training courses	Hours dedicated to training/education: 15 hours	<b>Total €savings: 1530</b>
				Number of people: 3	
				Price AP: 34€/h	
	Improvement of image through good practice	Number of advertisements published, talks and lectures given, and certificates or prizes received	Savings on the cost of an advertising campaign	Price of advertising spot 20": 900€	<b>Total € 9000+25000= 34000</b>
				Price of advert 2500€	
				Total spots and adverts: 10 each	
	Fostering of citizen participation and involvement	Number of people that participated and degree of involvement in the activities	Time invested by each citizen and number of messages and comments in the discussion forum	Time dedicated to each round of voting: 15 min	<b>Total € 6300+792.50=7092.50</b>
				Price min: 5€	
				Total people 1 <sup>st</sup> vote: 43	
Total people 2 <sup>nd</sup> vote: 41					
Total messages in the discussion forum: 61					
Total comments in the discussion forum: 195					
Price of message: 5€					
Price of comment: 2.5 €					
<b>CITIZENS OF CADRETE</b>	Knowledge of new e-Participation experiences	Time dedicated to learning the experience	Savings on the cost of training courses	Hours dedicated to training/education: 20 hours	<b>Total €savings: 27200</b>
				Number of people: 40	
				Price AP: 34€/h	
	Acquiring technological knowledge	Time dedicated to learning	Savings on the cost of training courses	Hours dedicated to training/education: 15 hours	<b>Total €savings: 14400</b>
				Number of people: 40	
				Price AP: 34€/h	
	Social and individual learning through the discussion forum	Time dedicated to learning	Savings on the cost of training courses	Hours dedicated to training/education: 10 hours	<b>Total €savings: 13600</b>
				Number of people: 40	
				Price TU: 34€/h	

<b>GDMZ</b>	Increase in the value of the methodology applied by the GDMZ	Number of tools created	Cost of each tool used	Cost of Software: 1920€
				Cost of Forum: 790€
				<b>Total € 2710</b>
	Social Recognition	Number of prize received	Amount received from each prize	Total prizes received: 2 (EPSA and UNPS)
				<b>Total € 2000</b>
		Number of conferences	Price of each congress	Number of congresses: 8
				Average price: 300€
		<b>Total € 2400</b>		
		New projects awarded	Amount received from projects awarded	<b>Zaragoza Multi-criteria Decision Making Group</b>
				<b>Total € 10691</b>

For the outcomes “knowledge of new e-Participation experiences”, “acquiring technological knowledge” and “social and individual learning through the discussion forum”, the proxy “savings on the cost of training courses” has been used. To quantify them in monetary terms, the following have been taken into account: i) an estimation of the hours that each of the stakeholders would have had to dedicate to training/education, ii) the price per hour that an Associate Professor would charge for giving each of these courses and iii) an estimation of the number of students that would attend these courses. In the case of the council, the 3 people that worked in the council and were responsible for the implementation and the development of the Cadrete experience were taken into account. In the case of the citizens of Cadrete, the people that participated in the voting process were considered. As there were two rounds in which 43 and 41 people, respectively, participated, in the calculation of the proxy, we have used 40 people as the characteristic sample.

For the outcome “improvement of the council’s image through good practice”, the proxy “savings on the cost of an advertising campaign” has been used. The Cadrete experience has given the council a good image, leading to a social benefit which, in order to quantify it in monetary terms, has been considered the equivalent of the cost of carrying out an advertising campaign. To estimate this cost, the price of advertising spots and advertisements and the number of adverts have been taken into account.

To quantify the outcome “foster citizen participation and involvement”, the time dedicate by the citizen to the voting process has been used. To do so, a price per minute invested has been assigned. Further, the number of messages and comments posted on

the discussion forum has been taken into account. A price in euros has been estimated for the value of these messages and comments and a total for the proxy assigned to the outcome has been calculated.

To quantify the outcome “increase in the value of the methodology applied by the GDMZ”, the cost of both the software used in the experience and that of the tool of the forum has been taken into account.

Lastly, to quantify the outcome “social recognition” the following have been taken into account: i) the amount received from the two prizes obtained by the GDMZ for the development of the experience ii) the price paid for attending congresses to make known the research projects awarded through the development of the initiative and iii) the number of new projects that have been awarded as a result of the investigation carried out in the implementation of the Cadrete experience.

#### **4.4.2.6 Evaluation of the inputs**

Table 4.4 shows, in detail, all the inputs used to carry out the Cadrete experience.

**Table 4.4.** Inputs of the Cadrete experience

<b>INPUTS</b>
<b>INTELLECTUAL CAPITAL (R&amp;D)</b>
<ul style="list-style-type: none"><li>- Use of intellectual capital: N° of researchers participating (4 people in the Council and 15 from GDMZ), meetings and weekly debates during 1 year (35).</li></ul>
<b>MATERIAL RESOURCES</b>
<ul style="list-style-type: none"><li>- <b>Installations:</b> 4 rooms</li><li>- <b>Computer equipment (hardware):</b> 12 computers</li><li>- <b>Software:</b> Voting Applet in Java 6.18</li><li>- <b>Technological tools:</b> 1 projector</li><li>- <b>Web browsers:</b> Mozilla and Internet Explorer 8</li><li>- <b>Documentation:</b><ul style="list-style-type: none"><li>- 1600 leaflets</li><li>- 1949 letters sent to citizens</li><li>- 15 letters sent to associations</li><li>- 20 posters</li><li>- 1 online guide</li><li>- 1 questionnaire</li><li>- 1 final report</li></ul></li><li>- <b>Web pages:</b> 1 web page for the experience</li><li>- <b>Other materials:</b><ul style="list-style-type: none"><li>- 1 bracelet for fairground</li></ul></li></ul>

<ul style="list-style-type: none"> <li>- 1 cultural excursion</li> <li>- 2 quarterly gym season tickets</li> <li>- 3 inscriptions in sporting activities</li> <li>- 4 swimming pool season tickets</li> <li>- 20 USB memories</li> <li>- 30 electronic ID readers</li> </ul>
<b>HUMAN RESOURCES</b>
<ul style="list-style-type: none"> <li>- <b>Council personnel:</b> 4 people: Mayoress, Secretary and 2 technicians</li> <li>- <b>Personal del GDMZ:</b> 15 people <ul style="list-style-type: none"> <li>- <u>Head Researcher</u> (HR): Professor (P)</li> <li>- <u>Mathematical modeling</u> (3 people): Associate Professor (AP), 1 Graduate (G) and 1 Fellow (F).</li> <li>- <u>Intelligent Data Analysis</u> (3 people): 1 Associate Professor (AP) and 2 Assistant Lecturers (AL)</li> <li>- <u>Informatics developments</u> (3 people): 2 Associate Professors (AP) and 1 technician (G)</li> <li>- <u>Communications Technology Group</u> (1 person/Engineer): Graduate (G)</li> <li>- <u>4 Political Scientists:</u> Graduates (G)</li> </ul> </li> <li>- <b>Collaborators</b> (1 person): Associate Professor (AP) <ul style="list-style-type: none"> <li>- Evaluation of the experience: 1 person (AP) (design of the questionnaire)</li> </ul> </li> </ul>
<b>TIME FACTOR</b>
Time is also a resource used in this experience.
<b>OTHER EXPENDITURE</b>
<ul style="list-style-type: none"> <li>- <b>Other allowances:</b> Meal tickets (14)</li> <li>- <b>Travel allowances (Zaragoza-Cadrete-Zaragoza_ 24km):</b> 12</li> </ul>

Source: Own elaboration

Research and development (R&D) expenditures are understood to be “*current and capital expenditures (both public and private) on creative work undertaken systematically to increase knowledge, including knowledge of humanity, culture, and society, and the use of knowledge for new applications. R&D covers basic research, applied research, and experimental development.*” (World Bank<sup>44</sup>). We have accounted for this type of expenditure through the number of researchers who participated in this experience as well as the number of meetings and the time employed in each of them (see Table 4.5).

Material resources are the goods and/or physical and tangible means necessary to achieve an objective, for example, installations, computer equipment (hardware), software, documentation etc.

<sup>44</sup> <http://datos.bancomundial.org/indicador/GB.XPD.RSDV.GD.ZS/countries/1W?display=graph> (7/04/2014)

Human resources include all the people who contribute work to an organization (whether profit-motivated or not and from any type of association).

The time factor encompasses the time invested in the implementation and development of the initiative.

The item “other expenditure” includes all the other expenditure incurred by an organization in achieving its objectives. In the case of the Cadrete experience, it includes allowances and travel expenses between Zaragoza and Cadrete.

#### **4.4.2.6.1 Establishing the units of measurement**

In this section, we present the units of measurement for each of the inputs used in the development of the experience.

The units of measurement taken into account for R&D expenditure will be the time dedicated to each of the meetings and the labor costs of those that intervened in the research carried out for the experience. Table 4.5 shows the hours invested in each stage that involved R&D expenditure.

**Table 4.5.** Units of measurement of R&D expenditure in the Cadrete experience

<b>R&amp;D expenditure (# hours invested)</b>		
<b>STAGE 2: SETTING THE PROBLEM</b>	<b>STAGE 3: IDENTIFYING THE ACTORS, FACTORS AND ALTERNATIVES</b>	<b>STAGE 4: MODELING THE PROBLEM</b>
<b>9 meetings</b>	<b>12 meetings</b>	<b>14 meetings</b>
<b>2.5 hrs/meeting</b>	<b>2 hrs/meeting</b>	<b>2 hrs/meeting</b>
<b>Total hours: 22.5 hrs</b>	<b>Total hours: 24 hrs</b>	<b>Total hours: 28 hrs</b>

Source: Own elaboration

In Stage 2, “setting the problem”, 9 meetings of two and a half hours each were held. The total time invested was 22.5 hours.

In Stage 3, “identifying the actors, factors and alternatives”, 12 meetings of 2 hours each were held, making a total of 24 hours.

And in Stage 4, “modeling the problem”, a total of 28 hours were invested in 14 meetings of 2 hours each.

Table 4.6 presents the units of measurement used to quantify the material resources. In most cases, the sale price and/or the time employed in the production of a good or service has been taken into account.

**Table 4.6** Unit of measurement of the material resources

MATERIAL RESOURCES	UNIT OF MEASUREMENT
- <b>Installations:</b> 4 rooms	Rent price Time (days, hours...)
- <b>Computer equipment (hardware):</b> 12 computers	Sale price
- <b>Software:</b> Voting Applet in Java 6.18	Price of applications Labor costs Time (days, hours...)
- <b>Technological tools:</b> 1 projector	Rent price Time (days, hours...)
- <b>Web browsers:</b> Mozilla and Internet Explorer 8	Sale price
- <b>Documentation:</b>	
1600 leaflets	Price
1949 letters to citizens	Price
15 letters to associations	Price
20 posters	Price
1 online guide	Labor costs Time (days, hours...)
1 questionnaire	Labor costs Time (days, hours...)
1 final report	Labor costs Time (days, hours...)
- <b>Web pages:</b> 1 web page for the experience	Price of domain Labor costs Time (days, hours...)
- <b>Other material:</b>	Sale price

Source: Own elaboration

When accounting for labor costs, we have distinguished between the academic and professional categories of the participants: Professor (P), Associate Professor (AP),

Assistant Lecturer (AL), Council Personnel (CP), Graduates (G) and Fellows (F). The following table shows the labor costs assigned to each.

**Table 4.7.** Labor costs according to academic and professional categories

CATEGORY	LABOR COSTS
Professor (P)	42€/h
Associate Professor (AP)	34€/h
Assistant Lecturer (AL)	32€/h
Council personnel (CP)	32€/h
Graduate (G)	28€/h
Fellow (F)	15€/h

Source: Own elaboration

Table 4.8. shows the units of measurement used to quantify the cost of human resources: labor costs and time.

**Table 4.8.** Units of measurement of human resources

HUMAN RESOURCES	UNIT OF MEASUREMENT
People	Labor costs
	Time (days, hours...)

With respect to the units of measurement used to quantify the item “other expenditure”, Table 4.9. shows that, for *other allowances*, the price of each meal or meal ticket is used while, for *travel allowances*, the price per kilometer is employed.

**Table 4.9.** Units of measurement of other expenditure

OTHER EXPENDITURE	UNIT OF MEASUREMENT
Other allowances	Sale price
Travel allowances	Price per kilometer

The following section presents, in monetary terms, the inputs used in the initiative.

**4.4.2.6.2 Measuring the inputs in monetary terms**

All the inputs used and expenditures incurred in the experience were quantified, in monetary terms, for each of the stages that form part of the methodology followed by e-Cognocracy. In this way, we individually accounted for the implementation cost of each stage of the Cadrete experience.

**Block 1: problem formulation**

Block 1 accounts for all the inputs that were necessary to carry out the experience in Stages 1 and 2 (Tables 4.10 and 4.11, respectively).

**Table 4.10.** Cost of Stage 1

<b>STAGE 1: PROBLEM PRESENTATION</b>		
<b>MATERIAL RESOURCES</b>	<b>UNIT OF MEASUREMENT</b>	<b>Total € 1647.95</b>
Installations: 1 room	Price rent/day	Price: 15 €/day
		Total days/meetings: 6
		<b>Total € 90</b>
Hardware: 1 computer	Price	Price of computer: 600€
		<b>Total € 600</b>
Technological tools: 1 projector	Price rent/day	Price: 35 €/day
		Total days/meetings: 6
		<b>Total € 210</b>
Web Browsers: Mozilla and Internet Explorer	Price	<b>0€</b>
Documentation:		
1600 leaflets	Price	<b>Total € 140</b>
1964 letters	Price	<b>Total € 90</b>
20 posters	Price	<b>Total € 35</b>
1 online guide	€/hour	Price Political Scientist (G): 28€/h
		Total hours: 5
		<b>Total € 140</b>
1 web page	Price; €/hour	Price Domain: 6.95€
		Price Technician (G): 28€/h
		Total hours: 12
		<b>Total € 342.95</b>
<b>HUMAN RESOURCES</b>	<b>UNIT OF MEASUREMENT</b>	<b>Total € 2152</b>
# council personnel: 4	Euros/hour	Price CP: 32€/hour
		Total hours: 12 (2hrs/meeting)
		Total € 1 person: 384
		<b>Total €4 people: 1536</b>
# GDMZ personnel: HR (P) and 1 technician (G)	Euros/hour	Price HR (P): 42€/h
		Total hours HR: 12
		<b>Total €HR: 504</b>
		Price Technician (G): 28€/h
		Total hours Technician: 4
		<b>Total €Technician: 112</b>
<b>OTHER EXPENDITURE</b>	<b>UNIT OF MEASUREMENT</b>	<b>Total € 27.36</b>
Journeys (Z-C-Z):	Price per kilometer	Price: 0.19€/Km
		Z-C-Z: 24km
		Total journeys: 6
		Total km: 144
		<b>Total € 27.36</b>
<b>TOTAL COST OF STAGE 1: 3827.31€</b>		

Source: Own elaboration

The total cost of carrying out Stage 1 was 3827.31€.

**Table 4.11.** Cost of Stage 2

<b>STAGE 2: SETTING THE PROBLEM</b>		
<b>MATERIAL RESOURCES</b>	<b>UNIT OF MEASUREMENT</b>	<b>Total € 2835</b>
Installations: 1 room	Price rent/day	Price: 80€/day
		Total days/meetings: 9
		<b>Total € 720</b>
Hardware: 3 computers	Price	Price computer: 600€
		<b>Total €3 computers: 1800</b>
Technological tools: 1 projector	Price rent/day	Price: 35 €/day
		Total days/meetings: 9
		<b>Total € 315</b>
Web browsers: Mozilla	Price	<b>0€</b>
<b>HUMAN RESOURCES</b>	<b>UNIT OF MEASUREMENT</b>	<b>Total € 5940</b>
# council personnel: 2	Euros/hour	Price: 32€/hour
		Total hours: 22.5
		Total € 1 person: 720
		<b>Total €2 people: 1440</b>
# GDMZ personnel: - HR (P) - Technician (G) - 2 IT specialists (AP) - 1 engineer (G) - Mathematician (AP)	Euros/hour	Price IP (CU): 42€/hour
		Total hours IP: 22.5
		<b>Total €IP: 945</b>
		Price Technician (L): 28€/hour
		Total hours Technician: 22.5
		<b>Total €Technician: 630</b>
		Price IT specialist (TU): 34€/hour
		Total hours IT specialist: 22.5
		Total € 1 IT specialist: 765
		<b>Total €2 IT specialists: 1530</b>
		Price Engineer (L): 28€/hour
		Total hours Engineer: 22.5
		<b>Total €Engineer: 630</b>
Price (AP):34€/hour		
Total hours : 22.5		
<b>Total €Mathematician: 765</b>		
<b>TOTAL COST OF STAGE 2: 8775€</b>		

Source: Own elaboration

The total cost of developing Stage 2 was 8775€.

The total cost of Block 1 was: 12602.31€

**Block 2: problem resolution**

Block 2 accounts for all the inputs that were necessary to carry out the experience in Stages 3, 4, 5, 6, 7, 8, 9 and 10 (Tables 4.12, 4.13, 4.14, 4.15, 4.16, 4.17, 4.18, respectively).

**Table 4.12. Cost of Stage 3**

<b>STAGE 3: IDENTIFYING THE ACTORS, FACTORS AND ALTERNATIVES</b>		
<b>MATERIAL RESOURCES</b>	<b>UNIT OF MEASUREMENT</b>	<b>Total € 1380</b>
Installations: 1 room	Price rent/day	Price: 80€/day
		Total days/meetings: 12
		<b>Total € 960</b>
Hardware: 3 computers	Price computer	Accounted for in Stage 2
Technological tools: 1 projector	Price rent/day	Price: 35 €/day
		Total days/meetings: 12
		<b>Total € 420</b>
Web browsers: Mozilla	Price	<b>0€</b>
<b>HUMAN RESOURCES</b>	<b>UNIT OF MEASUREMENT</b>	<b>Total € 3456</b>
# GDMZ personnel: - HR (P) - 2 IT specialists (AP) - 1 Mathematician (AP)	Euros/hour	Price HR (CU): 42€/hour
		Total hours HR: 24
		<b>Total €HR: 1008</b>
		Price IT specialist (AP): 34€/hour
		Total hours IT specialist: 24
		Total € 1 IT specialist: 816
		<b>Total €2 IT specialists: 1632</b>
		Price Mathematician (TU):34€/hour
		Total hours : 24
		<b>Total €Mathematician: 816</b>
<b>TOTAL COST OF STAGE 3: 4836€</b>		

Source: Own elaboration

The total cost of developing Stage 3 was 4836€.

**Table 4.13.** Cost of Stage 4

<b>STAGE 4: MODELING THE PROBLEM</b>		
<b>MATERIAL RESOURCES</b>	<b>UNIT OF MEASUREMENT</b>	<b>Total € 1610</b>
Installations: 1 room	Price rent/day	Price: 80€/day
		Total days/meetings: 14
		<b>Total € 1120</b>
Hardware: 3 computers	Price computer	Accounted for in Stage 2
Technological tools: 1 projector	Price rent/day	Price: 35 €/day
		Total days/meetings: 14
		<b>Total € 490</b>
Web browsers: Mozilla	Price	<b>0€</b>
<b>HUMAN RESOURCES</b>	<b>UNIT OF MEASUREMENT</b>	<b>Total € 5600</b>
# GDMZ personnel: - HR (P) - 1 technician (G) - 2 IT specialists (AP) - 1 engineer (L) - 1 Mathematician (AP)	Euros/hour	Price HR (P): 42€/hour
		Total hours HR: 28
		<b>Total €HR: 1176</b>
		Price Technician (G): 28€/hour
		Total hours Technician: 28
		<b>Total €Technician: 784</b>
		Price IT specialist (AP): 34€/hour
		Total hours IT specialist: 28
		Total € 1 IT specialist: 952
		<b>Total €2 IT specialists: 1904</b>
		Price Engineer (G): 28€/hour
		Total hours Engineer: 28
		<b>Total €Engineer: 784</b>
		Price Mathematician (AP):34€/hour
		Total hours : 28
<b>Total €Mathematician: 952</b>		
<b>TOTAL COST OF STAGE 4: 7210€</b>		

Source: Own elaboration

The total cost of developing Stage 4 was 7210€.

**Table 4.14.** Cost of Stage 5

<b>STAGE 5: VALUATION I</b>		
<b>MATERIAL RESOURCES</b>	<b>UNIT OF MEASUREMENT</b>	<b>Total € 6930</b>
Installations: 2 rooms	Price rent/hour	Price: 15 €/hour
		Total 7 hours: 7 hours
		<b>Total € rent 2 rooms: 210</b>
Hardware: 12 computers	Price	Price computer: 600€
		1 accounted for in Stage 1
		3 accounted for in Stage 2
		Total computers: 8
		<b>Total € 4800</b>
Software: Voting Applet in Java 6.18	€/hour	Price Technician (G): 28€/hour
		Total 7 hours Technician: 20
		<b>Total € Technician: 560</b>
		Price IT specialist (AP): 34€/hour
		Total hours IT specialist: 20
		Total € 1 IT specialist: 680
		<b>Total € 2 IT specialist: 1360</b>
Web browsers: Mozilla and Internet Explorer	Price	<b>0€</b>
<b>HUMAN RESOURCES</b>	<b>UNIT OF MEASUREMENT</b>	<b>Total €1995</b>
# Council personnel: 2	Euros/hour	Price (CP): 32€/hour
		Total hours (CP): 7
		<b>Total € 2 people: 448</b>
# personas del GDMZ: - HR (P) - Technician (G) - 4 Political Scientists (G) - 1 Fellow (G)	Euros/hour	Price HR (P): 42€/hour
		Total hours HR: 7
		<b>Total € HR: 294</b>
		Price Technician (G): 28€/hour
		Total hours Technician: 7
		<b>Total € Technician: 196</b>
		Price Political Scientist (G): 34€/hour
		Total hours Political Scientist: 7
		Total € 1 Political Scientist: 238
		<b>Total € 4 Political Scientists: 952</b>
Price Fellow (G): 15€/hour		
Total hours Fellow: 7		
		<b>Total € Fellow: 105</b>
<b>OTHER EXPENDITURE:</b>	<b>UNIT OF MEASUREMENT</b>	<b>Total € 69.68</b>
Journeys (Z-C-Z):	Price per kilometer	Price: 0.19€/Km
		Z-C -Z: 24km
		Total journeys: 3
		Total km: 72
		<b>Total € 13.68</b>
Other allowances	Price	Price meal: 8€
		Total meals: 7
		<b>Total € 56</b>
<b>TOTAL COST OF STAGE 5: 8994.68€</b>		

Source: Own elaboration

The total cost of developing Stage 5 was 8994.68€

**Table 4.15.** Cost of Stage 6

<b>STAGE 6: DETERMINATION OF INITIAL POSITIONS</b>		
<b>MATERIAL RESOURCES</b>	<b>UNIT OF MEASUREMENT</b>	<b>Total € 0</b>
Hardware: 2 computers	Price	Price computer: 600€ Accounted for in Stage 2
Web browsers: Mozilla	Price	<b>0 €</b>
<b>HUMAN RESOURCES</b>	<b>UNIT OF MEASUREMENT</b>	<b>Total € 372</b>
# GDMZ personnel: - Technician (G) - IT specialist (AP)	Euros/hour	Price Technician (L): 28€/hour Total hours Technician: 6 <b>Total € Technician: 168</b> Price IT specialist (AP): 34€/hour Total hours IT specialist: 6 <b>Total € IT specialist: 204</b>
<b>TOTAL COST OF STAGE 6: 372 €</b>		

Source: Own elaboration

The total cost of developing Stage 6 was 372€

**Table 4.16.** Cost of Stage 7

<b>STAGE 7: CITIZEN DEBATE AND DISCUSSION</b>		
<b>MATERIAL RESOURCES</b>	<b>UNIT OF MEASUREMENT</b>	<b>Total € 790</b>
Hardware: 2 computers	Price	Price computer: 600€ Accounted for in Stage 2
Web browsers: Mozilla	Price	<b>0 €</b>
IT tools: Forum	Price; €/hour	Price Technician (G): 28€/hour Total hours Technician: 10 <b>Total € Technician: 280</b> Price IT specialist (TU): 34€/hour Total hours IT specialist: 15 <b>Total € IT specialist: 510</b>
Documentation: - Web page	Price; €/hour	Accounted for in Stage 1
<b>HUMAN RESOURCES</b>	<b>UNIT OF MEASUREMENT</b>	<b>Total € 0</b>
# GDMZ Personnel: - Technician (G) - IT specialist (AP)	Euros/hour	Accounted for in IT tools
<b>TOTAL COST OF STAGE 7: 790</b>		

Source: Own elaboration

The total cost of developing Stage 7 was 790€

**Table 4.17. Cost of Stage 8**

<b>STAGE 8: VALUATION II</b>		
<b>MATERIAL RESOURCES</b>	<b>UNIT OF MEASUREMENT</b>	<b>Total € 210</b>
Installations: 2 rooms	Price rent/hour	Price: 15 €/hour
		Total hours: 7 hours
		<b>Total €rent 2 rooms: 210</b>
Hardware: 12 computers	Price	Price computer: 600€
		1 accounted for in el Stage 1
		3 accounted for in Stage 2
		8 accounted for in Stage 5
		<b>Total € 0 €</b>
Software: Voting Applet in Java 6.18	€/hour	Accounted for in Stage 5
Web browsers: Mozilla and Internet Explorer	Price	<b>0€</b>
<b>HUMAN RESOURCES</b>	<b>UNIT OF MEASUREMENT</b>	<b>Total €1995</b>
#Council personnel: 2	Euros/hour	Price CP: 32€/hour
		Total hours CP: 7
		Total € 1 person: 224
		<b>Total €2 people: 448</b>
# GDMZ personnel: - HR (P) - Technician (G) - 4 Political Scientists (G) - 1 Fellow (G)	Euros/hour	Price HR (P): 42€/hour
		Total hours HR: 7
		<b>Total €HR: 294</b>
		Price Technician (G): 28€/hour
		Total hours Technician: 7
		<b>Total €Technician: 196</b>
		Price Political Scientist (G): 34€/hour
		Total hours Political Scientist: 7
		<b>Total €4 Political Scientists: 952</b>
		Price Fellow (G): 15€/hour
Total hours Fellow: 7		
<b>Total €Fellow: 105</b>		
<b>OTHER EXPENDITURE</b>	<b>UNIT OF MEASUREMENT</b>	<b>Total € 69.68</b>
Journeys (Z-C-Z):	Price per kilometer	Price: 0.19€/Km
		Z-C-Z: 24km
		Total journeys: 3
		Total km: 72
		<b>Total € 13.68</b>
Other allowances	Price	Price meal: 8€
		Total meals: 7
		<b>Total € 56</b>
<b>TOTAL COST OF STAGE 8: 2274.68€</b>		

Source: Own elaboration

The total cost of developing Stage 8 was 2274.68€

**Table 4.18.** Cost of Stage 9

<b>STAGE 9: DETERMINATION OF NEW POSITIONS</b>		
<b>MATERIAL RESOURCES</b>	<b>UNIT OF MEASUREMENT</b>	<b>Total € 0</b>
Hardware: 2 computers	Price	Price computer: 600€ Accounted for in Stage 2
Web browsers: Mozilla	Price	<b>0 €</b>
<b>HUMAN RESOURCES</b>	<b>UNIT OF MEASUREMENT</b>	<b>Total € 372</b>
# GDMZ personnel: - Technician (L) - IT specialist (AP)	Euros/hour	Price Technician (G): 28€/hour
		Total hours Technician: 6
		<b>Total €Technician: 168</b>
		Price IT specialist (AP): 34€/hour
		Total hours IT specialist: 6
		<b>Total €IT specialist: 204</b>
<b>TOTAL COST OF STAGE 9: 372 €</b>		

Source: Own elaboration

The total cost of developing Stage 9 was de 372€

The cost of developing “Stage 10: system behavior analysis” has not been calculated as, in this particular case (the Cadrete experience), the analysis was not carried out.

Therefore, the total cost of Block 2 was: 24849.36 €

### **Block 3: knowledge extraction and democratization**

As was commented previously, the activities corresponding to this block have not been taken into account in the SROI analysis.

### **Block 4: Evaluation and documentation of e-Cognocracy**

Block 4 accounts for all the inputs that were necessary to carry out the experience in Stages 15 and 16 (Tables 4.19 and 4.20, respectively).

**Table 4.19.** Cost of Stage 15

<b>STAGE 15: EFFECTIVENESS OF E-COGNOCRACY</b>		
<b>MATERIAL RESOURCES</b>	<b>UNIT OF MEASUREMENT</b>	<b>Total € 1114,50</b>
Installations: 1 room	Price rent/hour	Price: 15 €/hour
		Total hours: 7 meetings/7 hours
		<b>Total €rent 1 room: 105</b>
Hardware: 3 computers	Price	Accounted for in Stage 2
IT tools: draw up the questionnaire	Price rent/hour	Price: 35 €/hour
		35 €/hour: 7 hours= 245€
Web browsers: Mozilla	Price	<b>0€</b>
Documentation:		
Questionnaire: 1	€/hour	Accounted for in Human resources
Web pages: 1	Price; €/hour	Accounted for in Stage 1
<u>Other materials:</u>		
- 1 bracelet for fairground	Price	Price bracelet: 19.50€
		<b>Total €bracelet: 19.50</b>
- 1 cultural excursion	Price	Price excursion: 35€
		<b>Total €excursion: 35€</b>
- 2 quarterly gym season tickets	Price	Price season ticket: 70€
		<b>Total €season tickets: 140€</b>
- 3 inscriptions in sporting activities	Price	Price activity: 75€
		<b>Total €activities: 225</b>
- 4 swimming pool season tickets	Price	Price season ticket: 60€
		<b>Total €season tickets: 240</b>
20 USB memories	Price	Price USB: 4€
		<b>Total €USBs: 80</b>
- 30 electronic ID readers	Price	Price reader: 9€
		<b>Total €reader: 270</b>
<b>HUMAN RESOURCES</b>	<b>UNIT OF MEASUREMENT</b>	<b>Total € 1792</b>
# GDMZ personnel:		Price HR (P): 42€/hour
- HR (P)		Total hours HR: 10
- 1 IT specialist (AP)		<b>Total €HR: 420</b>
- 1 collaborator (AP)		Price IT specialist (G): 28€/hour
- 1 Fellow (L)		Total hours IT specialist: 7
		<b>Total €IT specialist: 196</b>
		Price Collaborator(AP): 34€/hour
		Total hours Collaborator: 24
		<b>Total €Collaborator: 816</b>
		Price (AP): 15€/hour
		Total hours Fellow: 24
		<b>Total €Fellow: 360</b>
<b>TOTAL COST OF STAGE 15: 2906.50€</b>		

Source: Own elaboration

The total cost of developing Stage 15 was 2906.5€

**Table 4.20.** Cost of Stage 16

<b>STAGE 16: DOCUMENTATION OF THE PROJECT</b>		
<b>MATERIAL RESOURCES</b>	<b>UNIT OF MEASUREMENT</b>	<b>Total € 1344</b>
Hardware: 1 computer	Price	Accounted for in Stage 2
Web browsers: Mozilla	Price	<b>0 €</b>
Documentation: - Final report	Euros/hour	Price HR (P): 42€/hour
		Total hours HR: 32
		<b>Total €HR: 1344</b>
<b>HUMAN RESOURCES</b>	<b>UNIT OF MEASUREMENT</b>	<b>Total € 344.56</b>
# Council personnel: 4	Euros/hour	Price CP: 32€/hour
		Total hours: 2 (2hrs/meeting)
		Total € 1 person: 64
		<b>Total €4 people: 256</b>
# GDMZ personnel: - HR (P)	Euros/hour	Price HR (P): 42€/hour
		Total hours HR: 2 (2hrs/meeting)
		<b>Total €HR: 84</b>
Journeys (Z-C-Z):	Price per kilometer	Price: 0.19€/Km
		Z-C-Z: 24km
		Total journeys: 1
		Total km: 24
<b>Total € 4.56</b>		
<b>TOTAL COST OF STAGE 16: 1688.56€</b>		

Source: Own elaboration

The total cost of developing Stage 16 was 1688.56€

The total cost of Block 4 was: 4595.06€

#### 4.4.2.6.3 Obtaining the final cost

Table 4.21 shows the total cost, broken down according to the blocks followed in the methodology of e-Cognocracy, of the implementation of the experience carried out in Cadrete.

**Table 4.21.** Total cost of the experience

<b>TOTAL COST</b>	
<b>BLOCK 1 →</b>	12602.31€
<b>BLOCK 2 →</b>	24849.36€
<b>BLOCK 3 →</b>	0€
<b>BLOCK 4 →</b>	4595.06€
<b>TOTAL €</b>	<b>42046.73€</b>

#### **4.4.2.7 Calculation of the SROI coefficient**

This section presents the calculation of the SROI coefficient, that is, the division between the value of the social benefits (monetary results) and the value of the investment (value of the inputs).

**Table 4.22.** SROI Coefficient

<b>Calculation of the SROI coefficient</b>	
Social benefits	115623.50€
Value of the investment	42046.73€
<b>Coefficient</b>	<b>2.75</b>

The coefficient has a value of 2.75, which means that, for each monetary unit invested in the Cadrete experience, a return of 2.75 monetary units of social value has been obtained.

#### **4.4.2.8 Final report**

Carrying out this SROI analysis has allowed the identification and quantification in monetary terms not only of the inputs that were necessary for the implementation and development of the e-Participation experience, based on e-Cognocracy, that took place in Cadrete but also of the outcomes obtained (social benefits). The relation between the social benefits and the total value of the investments of the experience has allowed us to calculate the SROI coefficient. The value of this coefficient was 2.75 units. This means that, for each monetary unit invested in the Cadrete experience, a return of 2.75

monetary units of social value has been obtained. Furthermore, it leads us to the conclusion that, in the development of an initiative based on e-Cognocracy, not only economic but also social and environmental value is created.

The carrying out of this SROI analysis shows a social-economic approach to the e-Participation experience, based on e-Cognocracy, that took place in Cadrete. As its name indicates, this is an approach and, as such, it has its limitations. Besides, the Cadrete experience is a pilot experience and presents some limitations. This SROI analysis has not taken into account the evaluation of some outcomes, especially the intangible ones. The transparency of the process of participation, stakeholder satisfaction from feeling involved in the experience, cohesion, freedom, and equity are outcomes that have not been evaluated in the carrying out of this analysis due to their intangible nature and to the limitations of the experience. For the same reason, the filtering coefficients of the social and environmental impact have not been considered. Furthermore, in the item of *intellectual capital*, and in the development and elaboration of the software, the capital received by the GDMZ for the hiring of technical personnel during 2009, 2011 and 2012 has not been taken into account. The total quantity received amounted to 29,183 euros. It is intended that these limitations will be addressed and remedied with the application of the SROI analysis to other e-Participation experiences.

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# **CONCLUSIONES Y FUTURAS LÍNEAS DE INVESTIGACIÓN**

Esta sección recoge las principales conclusiones extraídas de la realización de esta tesis, así como las principales líneas futuras de investigación.

## **CONCLUSIONES**

Tanto los gobiernos como los ciudadanos están demandando, cada vez más, una gestión pública de carácter más participativo que aproveche el talento y la creatividad de la ciudadanía en la resolución de los problemas complejos que se plantean en el ámbito de las decisiones públicas.

Un problema que viene preocupando desde sus orígenes a la especie humana es el de establecer el modelo de organización más adecuado a cada época de la historia, según cuáles sean las características y demandas de la misma. En los albores del siglo XXI, en la conocida como Sociedad del Conocimiento, hay un elemento diferencial con cualquier otro periodo histórico, este elemento es el potencial que ofrecen las tecnologías de la información y de la comunicación. Las TIC posibilitan una mejor comunicación y una mayor conexión entre todos los actores implicados en la toma de decisiones públicas.

Esta interrelación entre los actores está permitiendo que la resolución de los problemas complejos planteados en las decisiones públicas relativas al gobierno de la sociedad, pueda realizarse en un contexto colaborativo aprovechando el conocimiento y el potencial creativo de todos los interesados en la misma. La participación que

permiten las tecnologías de las comunicaciones (e-Participación) puede aplicarse a cada una de las etapas contempladas en las metodologías seguidas en la toma de decisiones públicas (Moreno-Jiménez et al. 2001, Moreno-Jiménez, 2003a, Moreno-Jiménez et al., 2014). Más aún, como sugiere Steven Clift (Clift 2003), esta e-Participación, o mejor dicho Internet, permitirá salvar la propia democracia, algo cada vez más necesario.

Además, durante las últimas décadas se está planteando un importante debate sobre la idoneidad del modelo de democracia tradicional en el contexto de la sociedad del conocimiento. En particular, se está estudiando el modo en el que la democracia y las TIC pueden integrarse y complementarse en la búsqueda de una sociedad mejor.

Todo lo citado anteriormente, ha contribuido a que una serie de experiencias de participación electrónica hayan tenido lugar y muchas de ellas hayan hecho un uso extenso de las TIC (algunos ejemplos y descripciones de experiencias de e-participación se pueden encontrar en: Rogers, 2003; Phang y Kankanhalli, 2008; Panopoulou, et al, 2010; etc.) Muchas de estas iniciativas han contribuido a la revitalización de la democracia mediante el aumento de la transparencia en el gobierno y la creación de nuevos espacios políticos para la comunicación y la participación.

Es por ello, por lo que las Administraciones deben necesariamente incrementar el nivel de información disponible, y al hacerlo ponen a disposición de la ciudadanía más herramientas para el seguimiento y la evaluación de las políticas públicas. Actualmente, nos encontramos que la evaluación de la e-Participación es indispensable si se quiere saber con mayor precisión y objetividad sobre el valor, el impacto y el éxito de un proyecto de participación electrónica, iniciativa o programa (Aichholzer and Westholm 2009).

Como ya argumentaron Macintosh y White (2008) la necesidad de un marco de evaluación rigurosa ha surgido: En primer lugar, debido a la creciente cantidad de información disponible a través de Internet. En segundo lugar, la gran variedad de actores involucrados requiere una comunicación personalizada integrada con información relevante. Y en tercer lugar, destacar la necesidad del diseño de sistemas de información que permitan avanzar hacia entornos de trabajo colaborativos (gobierno y la sociedad civil).

## *Conclusiones y futuras líneas de investigación*

Surge de esta manera una necesidad de evaluar las experiencias de e-Participación así como cuantificar su verdadero valor añadido. El desarrollo de esta tesis establece un marco capaz de evaluar tanto una experiencia basada en la e-Cognocracia así como su extensión a cualquier iniciativa de e-Participación. Además, realiza un análisis SROI que permite medir, en términos monetarios, el valor creado de la aplicación práctica de una iniciativa de e-Cognocracia.

Como ya se comentó en el apartado de la introducción, los dos primeros capítulos son teóricos, los cuales presentan una visión clara de la situación actual. En el primer capítulo de la tesis se analiza cómo la aparición de una serie de cambios filosóficos, metodológicos y tecnológicos producidos durante finales del siglo XX, provocaron la aparición de nuevas necesidades (Moreno-Jiménez, 2003b). Además, se estudia el papel fundamental que ocupan las TIC en el marco del New Public Management (NPM) y del New Public Governance (NPG), para lograr los objetivos de mayor efectividad, eficacia y eficiencia en los quehaceres del sector público. Y por último, se presenta una revisión detallada de la literatura existente hasta la fecha sobre el concepto de e-Government.

Aprovechando el desarrollo de la tecnología, también es necesaria una profunda reflexión sobre la orientación que debe tener la democracia en el futuro y las posibilidades que ofrece Internet. En cualquier caso, los estudios sobre la mejora de la calidad de la democracia han incluido, en los últimos años, a las TIC como un factor altamente relevante. El capítulo 2 estudia el concepto de democracia partiendo de los modelos de democracia tradicionales expuestos por David Held. Además, analiza cómo la aparición de las TIC en la política han condicionado la introducción de cambios fundamentales en los sistemas políticos democráticos, lo que a su vez, ha supuesto la apertura de nuevas posibilidades y retos para la democracia apareciendo los nuevos modelos de democracia electrónica. Y finalmente, se explica el concepto de e-Cognocracia, conocida como el nuevo modelo de democracia cognitiva propuesto por José M<sup>a</sup> Moreno (Moreno-Jiménez 2003, 2004, 2006; Moreno-Jiménez and Polasek, 2003, 2004, 2005). La e-Cognocracia es un nuevo sistema de representación democrática que combina la democracia liberal o representativa y la democracia directa o participativa con una finalidad cognitiva. Persigue la creación y difusión social del conocimiento, la creación de una nueva sociedad más abierta, transparente, culta,

formada y libre; mejor cohesionada y conectada; más participativa, igualitaria y solidaria.

Los dos siguientes capítulos (3 y 4) son prácticamente empíricos ya que utilizan un caso de estudio (la experiencia real basada en la e-Cognocracia y llevada a cabo en el municipio de Cadrete) para dar respuesta a las necesidades de evaluación y cuantificación del valor creado de la implementación y desarrollo de una iniciativa de e-Participación.

En el capítulo 3 se estudia de forma detallada el concepto de e-Participación así como su relación con la e-Cognocracia. Además, se presenta un marco teórico basado en la aproximación EF3 para la evaluación de la e-Cognocracia. Este marco primero fue aplicado a través de un cuestionario implementado en la experiencia real llevada a cabo en Cadrete y usando los modelos de ecuaciones estructurales. Debido al número limitado de respuestas no fue posible validar el marco general propuesto para la evaluación conjunta de todos los aspectos señalados en el marco teórico EF3 (Moreno-Jiménez, Pérez Espés and Rivera, 2013). Sin embargo, el uso de esta aproximación nos ha permitido obtener algunas ideas y junto con el estudio de la literatura existente, hemos podido desarrollar este marco para la evaluación de cualquier experiencia de e-Participación, no sólo de la e-Cognocracia. La extensión del marco teórico EF3 fue validado por un grupo de expertos internacionales los cuales también asignaron pesos a los indicadores individuales para cada uno de los tres criterios (efectividad, eficacia y eficiencia). El marco validado fue llamado marco- EF<sup>3</sup> (EF<sup>3</sup>-framework) . Por último, se aplicó este marco (marco-EF<sup>3</sup>) a la experiencia de e-Participación basada en la e-Cognocracia del municipio de Cadrete (Zaragoza). Dicha experiencia fue evaluada en términos de efectividad, eficacia y eficiencia, utilizando una técnica multicriterio (AHP). La iniciativa de Cadrete fue evaluada como *buena*, con una puntuación de 0.5.

El capítulo 4 aborda un análisis, en términos monetarios, de los aspectos económicos y sociales, de la implantación y desarrollo de una experiencia de e-Participación basada en la e-Cognocracia. Para ello, utiliza la metodología del *Social Return on Investment* (SROI). Este análisis permite, tener una visión global sobre el verdadero valor añadido que aportan las iniciativas de e-Participación a la sociedad. Se analiza cómo una iniciativa crea valor a través del cálculo de un coeficiente que indica

cuánto valor en euros se crea por cada euro invertido. En el caso de la experiencia de Cadrete el coeficiente fue de 2,75, lo que quiere decir que por cada unidad monetaria invertida en la experiencia de Cadrete, se proyecta un retorno de 2,75 unidades monetarias de valor social.

## **FUTURAS LÍNEAS DE INVESTIGACIÓN**

La iniciativa de e-Participación llevada a cabo en Cadrete, es una experiencia piloto que ha servido para establecer una aproximación de la aplicación del marco creado (EF3-framework) para la evaluación de una experiencia de participación ciudadana electrónica. A partir del trabajo realizado en esta tesis, la investigación más inmediata se centra en mejorar y pulir el EF3-framework a través de su aplicación a otras iniciativas.

Además, en el análisis SROI llevado a cabo en el capítulo 4, no se han contemplado la valoración de los aspectos (económicos y sociales) intangibles. Por lo tanto, una línea futura de investigación inmediata será establecer una metodología que permita la medición, en términos monetarios, de los efectos intangibles derivados de la realización de una experiencia de e-Participación. Para ello, se utilizarán las técnicas de decisión multicriterio.

A su vez, se pretende estudiar y medir el impacto social, económico y ambiental de las Redes Sociales, en la formación de los ciudadanos y en la toma de decisiones de las Administraciones Públicas. Identificación de los “líderes sociales”; esto es, aquellas personas que con sus opiniones expresadas a través de Internet son capaces de modificar la estructura de preferencia de sus conciudadanos y conseguir que sigan sus propuestas (Moreno-Jiménez, 2003a, 2006). Estas ideas planteadas, están estrechamente relacionadas con los nuevos paradigmas abiertos en el ámbito de las finanzas (Blasco et al., 2008, 2011): las denominadas finanzas del comportamiento (behavioral finance). Esta línea de trabajo busca complementar las tradicionales teorías financieras introduciendo aspectos conductivistas en los procesos de toma de decisiones, analizando la forma en que los inversores obtienen, procesan y utilizan la información. La racionalidad y las emociones no son antitéticas, sino complementarias en los procesos

de toma de decisiones. Así, tanto en el entorno financiero como en cualquier entorno social, existen agentes informados que actúan por ser especialmente habilidosos en el procesamiento de la información, a la vez que existen agentes que racionalmente deciden que les aporta más utilidad la imitación de las decisiones de otros agentes a los que consideran mejor informados. La decisión de seguimiento o imitación es conocida como efecto gregario o efecto *herding* y se fundamenta en la escasa relación beneficio/coste de poseer conocimientos.

Todas estas ideas recientemente incorporadas al ámbito financiero están siendo contempladas en el contexto de la Administración por la e-Cognocracia. De ahí, las previsibles sinergias entre lo público y privado, pero con un soporte común: el comportamiento tanto racional como emocional de los individuos y sistemas. Uno de los objetivos del constructivismo cognitivo (Moreno-Jiménez, 2003; Moreno-Jiménez et al., 2001) característico de la e-Cognocracia, es el de proporcionar un tratamiento objetivo a lo subjetivo, o si se prefiere, un tratamiento racional a lo emocional que permita seguir garantizando el rigor científico.

Hoy en día, emoción, decisión (co-decisión) y cognición podrían ser tres aspectos claves a la hora de establecer el futuro de los modelos democracia y los de e-Participación. En particular, los asociados a la conocida como Sociedad del Conocimiento.

Además, nos encontramos con que prácticamente todos los países democráticos, utilizan herramientas interactivas basadas en la Web 2.0 y 3.0, para tratar de establecer un marco de la participación ciudadana en el proceso de toma de decisiones del gobierno, ofreciendo foros de discusión a través de los cuales la ciudadanía pueda plantear sus inquietudes acerca de las propuestas políticas sin ser sometidos a restricciones (Chang y Jacobson, 2010).

Sin embargo, hay varios inconvenientes a los que se debe hacer frente, algunos de ellos son de naturaleza socioeconómica como los problemas relacionados a las diferentes barreras y restricciones a las que se enfrentan los ciudadanos para acceder a estas nuevas herramientas de interacción que hacen que la participación no sea completa, y como las diferentes estrategias gubernamentales implantadas pueden favorecer esta participación (Julnes y Johnson, 2011). Deben tenerse en cuenta a las

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personas que por motivos económicos o sociales no pueden acceder a las herramientas que hacen posible la participación electrónica, este es un tema que debe ser considerado y analizado en el futuro.

Hay también problemas socio-tecnológicos que necesitan abordarse, uno de ellos es el importante papel que desempeñaría el voto electrónico a la hora de revitalizar la participación de los ciudadanos (Kenski, 2005). En este sentido, los investigadores deben demostrar si las herramientas tecnológicas que son usadas por los ciudadanos en su vida diaria, realmente permiten participar en la toma de decisiones en los procesos de ajuste y aplicación de medidas de los gobiernos, favoreciendo la democracia, o si por el contrario, estas herramientas son sólo usadas en ocasiones específicas como por ejemplo en las elecciones generales, donde los gobiernos ponen a disposición de los ciudadanos este tipo de recursos, sin que esto se mantenga en el tiempo.

En términos generales, la e-Participación es todavía una técnica incipiente, pese a ello, ha evolucionado notablemente en la última década. No obstante pensamos que es necesario mejorar los métodos utilizados para llevar a cabo las experiencias prácticas, usando técnicas de actuación más sofisticadas que den repuesta tanto a los gobiernos como a los ciudadanos. Para ello se hace necesario que todos los agentes afectados en los procesos participativos se involucren en mayor medida.

Estos datos, nos ayudan a pensar que en el futuro, el uso de las TIC, en los procesos de e-Participación, deberían implicar también una mejora en la gobernabilidad, entendida como una oportunidad para complementar y perfeccionar los conceptos y formas tradicionales de participación ciudadana y democracia.

Según nuestra opinión, el futuro de la participación electrónica requiere de tres aspectos fundamentales para que sea efectiva:

1. Un marco normativo que ordene con exhaustividad la transparencia del sector público y promueva e incentive la participación ciudadana.
2. Voluntad política, que favorezca la apertura y la participación reales y efectivas e implante un modelo de administración eficiente y responsable, lo que requiere la disposición de medios (personales, materiales y económicos) necesarios para su consecución.

3. Liderazgo y adecuación de este modelo de participación a la realidad política y social.

En resumen, la participación electrónica es un campo de investigación nuevo, que necesita de enfoques metodológicos, con sustento teórico, que refuercen las aplicaciones de las herramientas prácticas utilizadas en el desarrollo de la misma. Además, se deben unir esfuerzos que favorezcan aplicar métodos comunes que den respuesta a las demandas sociales de un entorno cambiante y globalizado. De esta manera, se contribuye a mejorar la democracia y los procesos políticos a través de una comunicación eficaz entre todos los ciudadanos, funcionarios, gobernantes y en general todos los agentes implicados en las decisiones colectivas. En próximas líneas futuras de investigación se intentará abordar todo lo expuesto anteriormente, con el fin de mejorar la e-Participación en sí misma.

# **CONCLUSIONS AND FUTURE RESEARCH LINES**

This section contains the main conclusions drawn from this thesis as well as the principal future research lines.

## **CONCLUSIONS**

Both governments and citizens are increasingly demanding a more participative type of public management that can take advantage of the talent and creativity of the citizenry in the resolution of the complex problems that arise in the sphere of public decisions.

A problem that has concerned human beings since their origins is that of establishing the most adequate model of organization for each epoch of history, depending on its characteristics and requirements. At the dawn of the XXI century, in the so-called Knowledge Society, there is an element that differentiates this period from any other in history, namely, the potential offered by information and communication technologies (ICT). These technologies allow better communication and greater connection between the actors involved in public decision making.

This interrelationship between actors is permitting the resolution of the complex problems arising in public decisions related to the government of society in a collaborative context, taking advantage of the knowledge and creative potential of all those interested. The participation that ICT permit (e-Participation) can be applied at each of the stages contemplated in the methodologies followed in public decision

### *Conclusions and future research lines*

making (Moreno-Jiménez et al. 2001, Moreno-Jiménez 2003, Moreno-Jiménez et al. 2014). Further, as Steven Clift (Clift 2003) suggests, this e-Participation or, more exactly, the Internet will allow the salvation of democracy itself, something that is ever more necessary.

Moreover, in recent decades, there has been an important debate about the suitability of the traditional model of democracy in the context of the Knowledge Society. In particular, the way in which democracy and ICT can be integrated and complement each other in the search for a better society is being studied.

All the above has led to a number of e-participation experiences taking place and they have made extensive use of ICT (some examples and descriptions of e-participation experiences can be found in: Rogers, 2003; Phang and Kankanhalli, 2008; and Panopoulou, et al., 2010). Many of these initiatives have contributed to the revitalization of democracy by increasing transparency in government and creating new political spaces for communication and participation.

This is why Administrations must increase the level of information available and provide citizens with more tools to follow and evaluate public policies. At present, the evaluation of e-Participation is indispensable if knowledge of greater precision and objectivity is wanted about the value, the impact and the success of an e-Participation project, initiative or program (Aichholzer and Westholm 2009).

As Macintosh and White (2008) argued, the need for a rigorous evaluation framework has arisen: First, the increasing amount of information available over the Internet implies a need for knowledge and information management systems. Second, the range of stakeholders involved requires personalized communication integrated with the delivery of relevant information. Third, they highlight the need for information systems designed to move towards more collaborative working environments.

In sum, there is a need to evaluate experiences and to quantify their real value added. This thesis establishes a framework capable of evaluating an experience based on e-Cognocracy and that can be extended to any e-Participation initiative. Furthermore, an SROI analysis is carried out that allows the measurement, in monetary terms, of the value created from the practical application of an e-Cognocracy initiative.

As was explained in the introduction section, the first two chapters are theoretical, presenting a clear vision of the current situation. The first chapter analyzes how the appearance of a series of philosophical, methodological and technological changes at the end of the XX century led to the emergence of new needs (Moreno-Jiménez, 2003b). It also studies the fundamental role of ICT, within the framework of the New Public Management (NPM) and the New Public Governance (NPG), to achieve the objectives of greater effectiveness, efficacy and efficiency in the workings of the public sector. Finally, it presents a detailed review of the extant literature on the concept of e-Government.

Taking advantage of technological developments, a profound reflection is also necessary about the direction democracy should take in the future and the possibilities offered by the Internet. Studies about the improvement of the quality of democracy in recent years have included ICT as a highly relevant factor. Chapter 2 studies the concept of democracy based on the traditional models of democracy presented by David Held. It also analyzes how the appearance of ICT in politics has conditioned the introduction of fundamental changes in democratic political systems which, in turn, have led to the opening of new possibilities and challenges for democracy and the emergence of new models of electronic democracy. Finally, the concept of e-Cognocracy, the new model of cognitive democracy proposed by José M<sup>a</sup> Moreno (Moreno-Jiménez 2003, 2004, 2006; Moreno- Jiménez and Polasek, 2003, 2004, 2005) is explained. E-Cognocracy is a new system of democratic representation that combines liberal or representative democracy and direct or participative democracy with a cognitive objective. It pursues the creation and social diffusion of knowledge and the creation of a new, more open society that is, transparent, cultured, educated and free, more cohesive and connected, more participative, egalitarian and solidarity-focused.

The following two chapters (3 and 4) are practically empirical as they use a case study (the real experience based on e-Cognocracy carried out in the municipality of Cadrete) to respond to the need to evaluate and quantify the value created through the implementation and development of an e-Participation initiative.

Chapter 3 studies in detail the concept of e-Participation and its relation with e-Cognocracy. It also presents a theoretical framework based on the EF3-approach for the

evaluation of e-Cognocracy. This framework was first evaluated through a questionnaire implemented in the real-life experience of Cadrete using SEM. Due to the limited number of responses, it was not possible to validate a general framework for the conjoint evaluation of all the aspects outlined in the theoretical EF3-framework (Moreno-Jiménez, Pérez Espés and Rivera, 2013). However, the use of this approach has allowed us to obtain ideas for extending the existing theoretical EF3-framework and, together with a study of the existing literature, to evaluate any e-Participation experience, not only e-Cognocracy. The extension of the theoretical EF3-Framework was validated by international experts who also assigned weights to individual indicators for each of the three criteria (effectiveness, efficacy and efficiency). The validated framework was called the EF<sup>3</sup>-framework. Finally, this framework (EF<sup>3</sup>-framework) was applied to the real-life e-Participation experience of the municipality of Cadrete (Zaragoza) to provide a proof of concept for assessing the impact of e-Participation, and the experience has been evaluated in terms of effectiveness, efficacy and efficiency, using a multi-criteria technique. The experience was evaluated as Good (G) because its score (0.5) is between the range of values 0.4 - 0.7.

Chapter 4 addresses an analysis, in monetary terms, of the economic and social aspects of the implantation and development of an e-Participation experience based on e-Cognocracy. It uses the Social Return on Investment (SROI) methodology. This analysis permits a global vision of the real value added that e-Participation initiatives provide for society. It analyzes how an initiative creates value through the calculation of a coefficient that indicates how much value, in euros, is created for each euro invested. In the case of the Cadrete experience, the coefficient was 2.75, which means that, for each monetary unit invested in the Cadrete experience, a return of 2.75 monetary units of social value has been obtained.

## **FUTURE RESEARCH LINES**

The e-Participation initiative carried out in Cadrete is a pilot experience that has served to establish an approximation of the application of the framework created (EF3-framework) for the evaluation of an experience of electronic citizen participation. On

the basis of the work carried out in this thesis, one immediate future research line will be to improve and polish the EF3-framework through its application to other initiatives.

Furthermore, in the SROI analysis carried out in Chapter 4, the evaluation of the intangible (economic and social) aspects has not been contemplated. Thus, another immediate future research line will be to establish a methodology that allows the measurement, in monetary terms, of the intangible effects derived from carrying out an e-Participation experience. For this purpose, multi-criteria decision-making techniques will be employed.

It is also our aim to study and measure the social, economic and environmental impact of social networks in the education of citizens and in the decision making of Public Administrations, as well as to identify “social leaders”; that is, those people whose opinions, expressed through the Internet, are capable of modifying the preference structure of their fellow citizens and of getting them to follow their proposals (Moreno-Jiménez, 2003a, 2006). These ideas are closely related to the new paradigms opened in the sphere of finance (Blasco et al., 2008, 2011), the so-called behavioral finance. This line of work seeks to complement traditional financial theories by introducing behavioral aspects into decision-making process and analyzing the way in which investors obtain, process and use information. Reason and emotions are not antithetical but complementary in decision-making processes: in the financial sphere, as in any other social environment, there are agents who act because they are especially skilled in the processing of information while others decide rationally that it is more useful to imitate the decisions of agents that they consider to be better informed. The decision to follow or imitate is known as the *herding* effect and is based on the low benefit/cost relation of possessing knowledge.

All these ideas, recently incorporated into the financial field, are being contemplated in the context of the Administration by e-Cognocracy. Thence, the predictable synergies between the public and the private but with a common basis, namely, the behavior, both rational and emotional, of individuals and systems. One of the objectives of cognitive constructivism (Moreno-Jiménez, 2003; Moreno-Jiménez et al., 2001), a characteristic of e-Cognocracy, is to provide an objective treatment to the

## *Conclusions and future research lines*

subjective realm or, in other words, a rational treatment to the emotional realm that allows a continued guarantee of scientific rigor.

Today, emotion, decision (co-decision) and cognition could be three key aspects when establishing the future of models of democracy and of e-Participation, especially those associated with what is known as the Knowledge Society.

Moreover, we find that practically all democratic countries use interactive tools based on Web 2.0<sup>45</sup> and 3.0 to try to establish a framework of citizen participation in the decision-making process of the government, offering discussion forums through which citizens can express their concerns about political proposals without restrictions (Chang and Jacobson, 2010).

However, there are a number of inconveniences that must be overcome, some of them of a socioeconomic nature, such as problems related to the different barriers and restrictions that citizens face to access these new tools of interaction (making the participation, consequently, incomplete) and how the different governmental strategies implemented can foster this participation (Julnes and Johnson, 2011). People who, for economic or social reasons, cannot access the tools that make electronic participation possible should be taken into account and this is a subject that must be considered and analyzed in the future.

There are also socio-technological problems that must be addressed, one of them being the important role of the electronic vote in revitalizing citizen participation (Kenski, 2005). Researchers must demonstrate whether the technological tools that citizens use in their daily lives really allow them to participate in the taking of decisions in the processes of adjusting and applying government measures, thus fostering democracy, or whether, on the contrary, these tools are only used on specific occasions, such as in general elections, when governments make this type of resources available to citizens but without maintaining them over time.

In general terms, e-Participation is still an incipient technique, even though it has evolved remarkably in the last decade. Nevertheless, we believe it is necessary to

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<sup>45</sup> Ribes (2007) defines Web 2.0 as all Internet utilities and services underpinned by a database that can be modified by the users of the service, either in its content (adding, changing or erasing information) or in the form of presenting it, or both in content and form, simultaneously.

improve the methods used to carry out practical experiences, using more sophisticated techniques that respond to the needs of both governments and citizens. For this, it is necessary for all the agents affected by the participative processes to become involved to a greater extent.

In the future, the use of ICT in e-Participation processes should also imply an improvement in governance and an opportunity to complement and perfect the traditional concepts and forms of citizen participation and democracy.

In our opinion, the future of electronic participation requires three fundamental aspects to be effective:

4. A framework that regulates the transparency of the public sector and that promotes and encourages citizen participation.
5. Political will to foster openness and real and effective participation and to implant an efficient and responsible model of administration, which requires the availability of the resources (human, material and economic) necessary for its achievement.
6. Leadership and the adequacy of this model of participation to the political and social reality.

In sum, electronic participation is a new field of research that needs methodological approaches, with a theoretical foundation, to strengthen the applications of the practical tools used in its development. Furthermore, efforts should be made to foster the application of common methods that respond to the social demands of a changing and globalized environment. In this way, contributions will be made to improve democracy and political processes through an effective communication between all the citizens, civil servants, governors and, in general, all the agents involved in collective decisions. In future research lines, all the above will be addressed to try to improve e-Participation.

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# ANNEXES

## ANNEX 1: CADRETE QUESTIONNAIRE

**CUESTIONARIO A LOS USUARIOS PARTICIPA.CADRETE.ES**

Este cuestionario permitirá evaluar la experiencia piloto realizada en Cadrete, e identificar los aspectos mejorables de cara a futuras aplicaciones del proceso de participación ciudadana seguido en el diseño de políticas públicas. La identificación de estas líneas de mejora es, para el grupo investigador que ha llevado a cabo la experiencia (GDMZ), un aspecto importantísimo en el desarrollo del trabajo. Por este motivo, os solicitamos encarecidamente que rellenéis la encuesta que evalúa la efectividad del proceso seguido.

**DATOS DE IDENTIFICACIÓN**

<b>Tipo de participación</b>	<input type="radio"/> Político <input type="radio"/> Asociación <input checked="" type="radio"/> Ciudadano
<b>Tipo de entrada</b>	<input checked="" type="radio"/> DNI tradicional <input type="radio"/> DNI electrónico
<b>Sexo</b>	<input checked="" type="radio"/> Hombre <input type="radio"/> Mujer
<b>Edad</b>	<input checked="" type="radio"/> 18-29 años <input type="radio"/> 30-44 años <input type="radio"/> 45-64 años <input type="radio"/> 65 y más años
<b>Estudios realizados</b>	<input checked="" type="radio"/> Educación básica <input type="radio"/> ESO/FP/Bachillerato <input type="radio"/> Estudios Universitarios
<b>Ocupación actual</b>	<input checked="" type="radio"/> Estudiante <input type="radio"/> Sus labores <input type="radio"/> Trabaja <input type="radio"/> Parado <input type="radio"/> Jubilado

A continuación se presentan una serie de afirmaciones. Por favor, indique su nivel de acuerdo o desacuerdo, para ello **seleccione** la puntuación que Usted cree que recoge mejor su opinión, desde 0 "Totalmente en desacuerdo" hasta 10 "Totalmente de acuerdo", si Usted no desea contestar, por favor, indique la opción NC.

<b>SISTEMAS DE PARTICIPACIÓN CIUDADANA:</b>	
Con el sistema actual de participación ciudadana, considero que los representantes electos defienden mis intereses	NC ▼
El Ciudadano no tiene ningún peso en la toma de decisiones políticas	NC ▼
Las Asociaciones no tienen ningún peso en la toma de decisiones políticas	NC ▼
El Ciudadano debe participar en el diseño de políticas públicas	NC ▼
Las Asociaciones deben participar en el diseño de políticas públicas	NC ▼
El Ciudadano debe decidir junto a los representantes electos en el diseño de las políticas públicas	NC ▼
Las Asociaciones deben decidir junto a los representantes electos en el diseño de las políticas públicas	NC ▼
Los Poderes Públicos cuentan con las opiniones de los Ciudadanos para el diseño de las políticas públicas	NC ▼
Los Poderes Públicos cuentan con las opiniones de las Asociaciones para el diseño de las políticas públicas	NC ▼
La Administración informa a la sociedad sobre los mecanismos de participación ciudadana existentes	NC ▼
La Administración informa a la sociedad de las decisiones tomadas	NC ▼
Esta iniciativa de participación ciudadana, contribuye a crear una sociedad mejor	NC ▼
<b>PARA LA CREACIÓN DE UNA SOCIEDAD MEJOR:</b>	
La participación se limita a la Consulta al Ciudadano por parte de la Administración	NC ▼
La participación incluye el Debate/Discusión con el Ciudadano, pero la Decisión la toma la Administración	NC ▼
La participación permite la Decisión conjunta entre la Administración y el Ciudadano	NC ▼
<b>QUE LE HA LLEVADO HA PARTICIPAR EN ESTA INICIATIVA:</b>	
Una iniciativa de participación ciudadana como ésta no me la puedo perder	NC ▼
Considero que es una oportunidad muy importante para manifestar mis opiniones	NC ▼
Considero que esta iniciativa me permitirá enriquecerme como persona	NC ▼
Estoy interesado en participar en la planificación de las actividades culturales y deportivas	NC ▼
No estoy de acuerdo con la gestión actual de las actividades culturales y deportivas	NC ▼

<b>SOPORTE Y APLICACIÓN INFORMÁTICA:</b>	
Los equipos informáticos han sido adecuados	NC ▼
La estructura de presentación del programa ha sido sencilla y comprensible	NC ▼
Ha sido fácil y cómodo ir de pantalla en pantalla (navegar)	NC ▼
Se han producido demasiados errores/incidencias en la aplicación informática	NC ▼
El número de pantallas era excesivo	NC ▼
El sistema de votación ha sido fácil de utilizar	NC ▼
El sistema de discusión para incorporar argumentos fue adecuado	NC ▼
El sistema de discusión me ha permitido conocer y compartir opiniones	NC ▼
Considero que mi anonimato estaba asegurado a lo largo de todo el proceso	NC ▼
En general, me ha gustado el diseño de la aplicación informática	NC ▼
En general, estoy satisfecho con la aplicación informática utilizada	NC ▼
<b>INFORMACIÓN PROPORCIONADA POR LA ADMINISTRACIÓN:</b>	
Ha sido fácil de entender	NC ▼
Ha sido la apropiada	NC ▼
Se ha recibido a tiempo	NC ▼
Prácticamente, no presentaba errores	NC ▼
En general, estoy satisfecho con la información que me han proporcionado	NC ▼
<b>PERSONAL DE APOYO EN EL PROCESO:</b>	
Me ha ayudado en el desarrollo del proceso de participación ciudadana	NC ▼
Me ha proporcionado información adicional	NC ▼
Sin el personal de apoyo, yo no hubiera podido participar	NC ▼
En general, estoy satisfecho con la ayuda del personal de apoyo	NC ▼

EN TÉRMINOS GENERALES:	
He disfrutado mucho participando en esta iniciativa	NC ▾
He aprendido mucho de esta experiencia	NC ▾
Siento que mi participación ha agudizado mi ingenio y mi creatividad	NC ▾
Una experiencia como ésta me ha permitido sentirme implicado en toma de decisiones políticas	NC ▾
Ha aumentado mi percepción de pertenencia social en mi municipio (identidad)	NC ▾
Creo que las discusiones que se han realizado en el foro han influido en mis decisiones	NC ▾
No he perdido el tiempo participando en esta experiencia	NC ▾
Volvería a participar en una experiencia como ésta	NC ▾
Otros municipios deberían incorporar este tipo de participación ciudadana	NC ▾
Este modelo de participación mejora el sistema democrático actual	NC ▾
Me siento satisfecho con mi participación en esta iniciativa	NC ▾

## ANNEX 2: INTERVIEW TO THE EXPERTS GROUP

First of all, I would like to thank you for your time and help in this interview and your contribution to our project.

### 1. CONTEXT OF THE RESEARCH

Before starting the survey I would like to present the context of our research.

In recent decades, the activities of the public sector have focused, among other things, on the creation of added value and the involvement of citizens in the political process through electronic participation. Macintosh (2004) defined e-participation as “the use of ICTs to broaden and deepen the political participation of citizens, so they can connect with each other and with their elected representatives”.

More and more e-participation practices and methods (Rowe and Frewer, 2000; 2004; Rogers, 2003; Phang and Kankanhalli, A., 2008; Panopoulou et al., 2010) have been developed but there are almost no approaches to rigorous evaluation ready for application in the field (Henderson et al., 2005; Janssen and Kies, 2005; Winkler, 2007);

emerging frameworks are still embryonic (Macintosh and Whyte, 2008; Aichholzer and Allhutter, 2008).

New experiences of participation are now required and they must be able to use the potential of the Knowledge Society and respond to the new challenges (transparency, participation, control etc.) and needs that it generates (Moreno-Jiménez, 2006) by utilising the potential of citizens to resolve highly complex problems. The diversity of current experiences of citizen participation in public decisions requires the analysis and evaluation of their viability in real-life situations. I currently hope to create a framework able to assess the Effectiveness, Efficacy and Efficiency (EF3 approach) of an eParticipation experience in a comprehensive manner in my Doctoral Thesis.

First of all, we elaborate on a theoretical framework (Figure 1) for the evaluation of experiences of eParticipation using an EF3 approach that allows the simultaneous evaluation of the efficiency, efficacy and effectiveness of the participatory experience (Moreno-Jiménez 2009, Moreno-Jiménez 2010). Figure 1 shows the framework which allows the evaluation of e-Cognocracy through the EF3 approach. This framework identifies the relevant aspects required for carrying out the evaluation (Moreno-Jiménez et al., 2012). The framework proposed for the integration of effectiveness (doing what is right), efficacy (achieving goals) and efficiency (doing things correctly) can be considered an extension of the TAM and Delone and McLean approaches: the perceptions and behaviour of citizens are used to evaluate the processes of citizen participation and the adoption of technology, as employed in the case of e-Cognocracy. E-Cognocracy (Moreno-Jiménez, 2003, 2004, 2006; Moreno-Jiménez and Polasek, 2003, 2004, 2005) is a new system of democratic representation that combines liberal, or representative, democracy, and direct, or participative, democracy to cognitive ends. It seeks the creation and social diffusion of knowledge and the construction of a more open, transparent, cultured, educated and freer society; a society that is more cohesive and connected, more participative, egalitarian and cooperative. The new system uses multicriteria decisions as its methodological support, the internet as its communication support and the democratic system as a catalyst for learning (Moreno-Jiménez, 2003).

For validating the theoretical framework proposed, we used the survey implemented in the real life experience of Cadrete, Spain through the Structural Equation Models

## *Annexes*

(SEM), or Covariance Structure Analysis (Bollen, 1989; Bollen and Lennox, 1991; Jöreskog and Sörbom, 1996; Bentler, 1995-2006) approach, which was chosen as it allows the researcher to formulate and evaluate the existence of latent variables from the reflected indicators (Bollen and Lennox, 1991), that is to say, variables that are not susceptible to direct observation. The software used was EQS 6.1 (Bentler, 1995-2006).

Due to the limited number of responses, it was not possible to validate a general framework for the conjoint evaluation of all the aspects outlined in the EF3 theoretical framework. Nevertheless, results obtained from the 20 valid responses identified a series of relationships that contributed to the formulation of a general framework (Moreno-Jiménez et al., 2012). The small sample size means that the evaluation and selection of the models is governed by goodness of fit indicators that do not directly depend on the number of observations (Bollen, 1989) SRMR, GFI and CFI. For all the measured and/or structural models, the estimated parameters were presented in their completely standardised version, norm 0-1, and, in addition, all the equations were given their corresponding coefficients of explained variance. The assessment of the construct is based on the methodology proposed by Bagozzi (Bagozzi, 1984) for the validation of multidimensional constructs and the covariance structure analysis of observed variables (McDonald's omega coefficient (McDonald, 1985) and Fornell and Larcker's coefficient, C-FL (Fornell, and Larcker, 1981). The stability of the parameters of the models was estimated and evaluated sequentially.

In the context of the theoretical framework proposed, the aforementioned concepts were understood as follows: efficiency is “the operational improvement of the current democratic system”; efficacy is the capacity of the current democratic system to “defend the interests of the citizens through their representatives; effectiveness is “the conjoint creation of a better society” (Moreno-Jiménez et al., 2012).

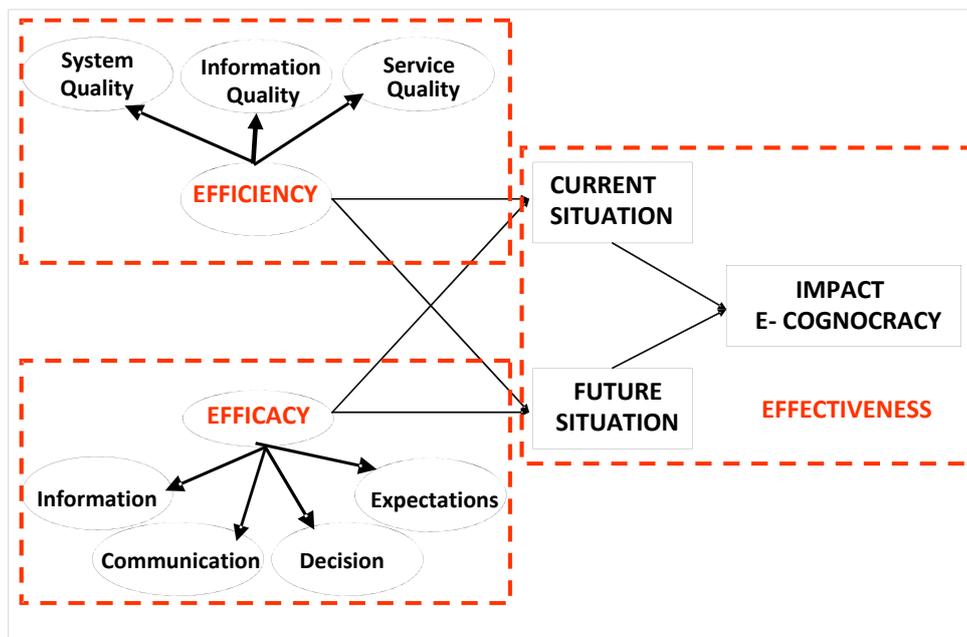
The relevant aspects determining efficiency are based on the three constructs contemplated by the model of DeLone and McLean (2003): the Information Technology application (System Quality), the information that is obtained (Information Quality) and the human resources support (Service Quality).

Four constructs are considered for the evaluation of efficacy: Information, Communication, Decision and Participation Expectation. Information can be considered

as a unidirectional flow of interaction (usually from the administration to the citizens). Communication is understood as two-way interaction: debate and discussion. In addition to the bi-directional flow of information, Decision includes the production of a co-decision between the Administration and Citizens. Finally, Participation Expectation refers to the identification of the characteristics that participation experiences should have in the future.

In this case of effectiveness is through the analysis of two scenarios as latent intermediate variables: the current situation and the ideal, and an endogenous variable that captures the idea of the creation of a better society.

**Figure 1.** EF3 framework for the evaluation of e-Cognocracy



After identifying the relevant aspects for an EF3-evaluation of e-Cognocracy, and with the aim of extending these ideas to any e-participation experience, the next step was to develop the framework for each criteria (effectiveness, efficacy and efficiency) in more detail, with a set of attributes, indicators and weights for evaluating the e-participation experiences in the context of the Knowledge Society (KS).

## 2. DEVELOPING IN THE FRAMEWORK FOR THE CRITERIA MORE DETAIL

### 2.1 Evaluating effectiveness

*Effectiveness* is associated with strategic planning or long-term behaviour. It is understood as the identification of the criteria relevant to the resolution of a problem (doing what is right) (Moreno-Jiménez, 1997, 2006).

We originally proposed a framework (the attributes contemplated were: “current situation, “future situation” and “impact of e-Cognocracy”) to evaluate Effectiveness, which was validated through a survey implemented in the real experience of Cadrete, Spain by SEM. But, now, after studying the literature, we think that the Effectiveness Framework should consider other attributes. We have therefore developed the framework in more detail (Table 1) and it will be validated by a group of experts. **As an expert, we would appreciate your opinion and suggestions towards validating this extension of the framework. Suggestions and tips can be added by double clicking the table.**

**Table 1.** Attributes and indicators for the evaluation of effectiveness

CRITERION: EFFECTIVENESS				
ATTRIBUTES	DESCRIPTION	INDICATORS	ANY CHANGE,TIP?	
P E O P L E	CONTROL (CO-DECISION)	The % of the citizens in the decision making process and the possibility of putting forward specific situations that are conjointly resolved and validate the politicians that are in power (motions of confidence in decisions).	% assigned to citizens to decide a policy/decision	
	PARTICIPATION (CO-CREATION)	Participation has been evaluated in many ways; in this case, the people that follow the discussions that create content and those that vote will be measured, along with the number of arguments that can be extracted from the discussion and decision processes	Clear track from participatory endeavour to the political decisions and the policy implementation	
			People who contributed to enhance the participation	
			How many topics were proposed for implementing the participation process	
			% of participation of population contributing to the polls	
		% of participation of population contributing to the discussion; number of messages		
		Number of political representatives engaging, including meetings with the citizens		
LEARNING (FORMATION)	The changes in and impacts of individual preferences between the two voting rounds and the discussion stage. The opinions of the others participants have influenced their final decisions.	I think that the discussions carried out in the forum have influenced my decisions (a question from the survey)		
FREEDOM (TOLERANCE)	The % of vetoed messages; the % of ideologically intransigent messages; the % of individuals with a change in the preference structure.	% censored messages; % ideological intransigent messages		
S O C I E T Y	SUBSISTENCE	The selection of the best individuals for the management of the systems	With the current system of citizen participation, representatives defend my interests (question from a survey)	
	COHESION	Qualified consensus (clear majorities) and limited veto. The number of groups that can be identified among individuals must be determined in the final decision.	Homogeneity of opinions, preferences and norms	
	EQUITY	Equal opportunity for all. There should be no digital, economic, social or cultural divides.	The Administration informs society about the decisions taken and the existing mechanisms for citizen participation (question from a survey)	
	SOCIAL WISDOM	The creation of a cultural resource of ethical values. The leaders should become a point of reference for society and, by example, engender ethical values (the social rejection of corruption, dishonest behaviour etc.).	A e-Participation experience contributes to create a better society (question from a survey)	

In the next step, we would like you assign weights to the attributes. Please, assign between 0 to 100 each block. For example, distribute 100 points among the criteria People and Society, and later, distribute another 100 points among the sub-criteria of People and Society. The sum total of each block must add up to 100 points.

**Table 2.** Weights for the attributes of evaluation of effectiveness

EFFECTIVENESS			
ATTRIBUTES		WEIGHT	
P E O P L E	CONTROL (CO-DECISION)		
	PARTICIPATION (CO-CREATION)		
LEARNING (FORMATION)			
FREEDOM (TOLERANCE)			
S O C I E T Y	SUBSISTENCE		
	COHESION		
	EQUITY		
	SOCIAL WISDOM		
The sum (should be 100 points):			0

## 2.2 Evaluating efficacy

*Efficacy* is associated with tactical planning or medium-term behaviour. It is defined as achieving the goals that are fixed by means of setting objectives (Moreno, 1997, 2006).

Four attributes are considered for the evaluation of efficacy: Information, Communication, Decision and Participation Expectation. Table 3 shows the framework which allows us to evaluate efficacy and was validated through the survey implemented in the real experience of Cadrete, Spain by SEM. **As an expert, we would like your opinion and suggestions to validate this extension of**

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**the framework. You can add your suggestions and tips by double clicking in the table.**

**Table 3.** Attributes and indicators for the evaluation of efficacy

<b>CRITERION: EFFICACY</b>			
<b>ATTRIBUTES</b>	<b>DESCRIPTION</b>	<b>INDICATORS</b>	<b>ANY CHANGE, TIP?</b>
INFORMATION	Existence of an unequivocal Administration-Citizen relationship	Government informs society about the mechanisms of citizen participation and the decisions taken	
COMMUNICATION	Existence of feedback	Government takes the opinions of the citizens into account in their decisions	
DECISION	A higher level of the relationship, that is to say, implication in the result or final selection	Citizens influence the making of public decisions	
EXPECTATIONS	Active participation and conjoint decision	Citizenry and their representatives should jointly participate and decide on the design of public policies	

**In the next step, we would like you assign weights to the attributes. Please, assign between 0 to 100 points to each block. The sum total of each block must add up to 100 points.**

**Table 4.** Weights for the attributes for the evaluation of efficacy

<b>EFFICACY</b>	
<b>ATTRIBUTES</b>	<b>WEIGHT</b>
INFORMATION	
COMMUNICATION	
DECISION	
EXPECTATIVES	
<b>The sum (should be) 100 points</b>	<b>0</b>

### 2.3 Evaluating efficiency

*Efficiency* is associated with operational planning or short-term behaviour. It is achieved through the best possible assignation of public resources (doing things correctly) (Moreno-Jiménez, 1997, 2006).

The relevant aspects of determining efficiency are based on the three inputs considered in the model (Delone and McLean, 2003): the Information Technology application (System Quality), the information that is obtained (Information Quality) and human resources support (Service Quality). Table 5 shows the framework obtained through the survey implemented in the real experience of Cadrete, Spain by SEM. **As an expert, we would appreciate your opinion and suggestions for validating this extension of the framework. You can add your suggestions and tips by double clicking in the table.**

**Table 5.** Attributes and indicators for the evaluation of efficiency

CRITERION: EFFICIENCY			
ATTRIBUTES	DESCRIPTION	INDICATORS	ANY CHANGE, TIP?
System Quality	Information Technology application should consider items like: Convenience, Navigation, Interactivity, Response time, Access	The tools used in the experience were appropriate, easy to use, navigate etc.	
Information Quality	The obtained information should contemplate items like: Precision, Relevance, Reliability, Ease of Understanding, Usefulness, Conciseness	The information was easy to understand, appropriate, without mistakes...	
Service Quality	The human resources support should contemplate items like: Interpersonal quality, Empathy, Responsiveness, Flexibility	Level of help from the support staff when participating in the experience	

**In the next step, we would like you assign weights to the attributes. Please assign from 0 to 100 points each block. The sum total of each block must add up to 100 points.**

**Table 6.** Weights for the attributes for the evaluation of efficiency

EFFICIENCY	
ATTRIBUTES	WEIGHT
System Quality	
Information Quality	
Service Quality	
<b>The sum (should be) 100 points</b>	<b>0</b>

### **3. APPLICATION OF THE FRAMEWORKS TO A REAL LIFE EXPERIENCE (Cadrete, Spain)**

It has been mentioned previously that for validating the theorist model proposed (Figure 1), we used a survey implemented in the real life experience of Cadrete, Spain.

In April 2010, the Cadrete Municipal Council, in collaboration with Zaragoza Multicriteria Decision Making Group (GDMZ), implemented a citizen participation project (<https://participa.cadrete.es>) aimed at giving the residents of the municipality a voice in public policy decisions. The issue in question was the design of cultural and sporting policies. There was one objective for the GDMZ: the validation of the methodological and technological tools and two main objectives for the City Council: (i) that decisions on the budget assigned to the aforementioned policies would be conjointly made by the politicians and the citizenry; (ii) that citizens would be encouraged to involve themselves in the debate and take part in the decision making process, and more specifically, that the arguments that supported the decisions would be publicly disseminated.

Participation was encouraged by the incorporation of a new group of actors: the neighborhoods associations. There were therefore three groups of actors that were given different weightings: (i) the politicians, with a weighting of 40%; (ii) the citizens - 44%; (iii) the local associations - 16%. The participants were local residents (on the electoral register) of over 18 years of age (politicians, citizens and representatives of the local associations). There were two voting options: with National Identity Card or with username and password. In accordance with e-Cognocracy methodology, there were two voting rounds interspersed by a forum discussion which emitted 61 messages, 37 related to cultural polices and 24 to sport. After finishing the project, participants were asked to complete an on-line questionnaire. At the conclusion of the experience, participants were asked to complete a questionnaire and, based on the proposed framework an attempt has been made to evaluate the attributes from the items used in the questionnaire. The measurement scale of the questionnaire was from

0 to 10 (0 = total disagreement, 10 = total agreement). There were 51 questions grouped in 7 sections: (i) The System of Citizen Participation; (ii) The Creation of a Better Society; (iii) Motivation; (iv) Evaluation of the Technological Support and Applications; (v) Evaluation of the Information; (vi) Evaluation of the Support Personnel and (vii) Overall Evaluation. Only 24 residents responded and 4 of the replies were invalid. Questionnaires were considered as invalid if: (i) less than 80% of the questions were answered; and (ii) if there was zero variability with regards to the total number of questions (Moreno-Jiménez et al., 2012).

The following tables show the frameworks to evaluate the effectiveness, efficacy and efficiency of the e-participation experience in Cadrete.

### 3.1 Criteria effectiveness

Table 7 shows the indicators and the value obtained in order to evaluate each attribute of effectiveness in the real life experience in Cadrete, Spain. Some of the indicators selected are questions from the survey (they are the average (mean value) of the scores given by the citizens of Cadrete in the survey).

**Table 7.** Indicators and value obtained for the effectiveness evaluation of the Cadrete experience

CRITERIA: EFFECTIVENESS			
ATTRIBUTES	CADRETE INDICATORS	CADRETE VALUE	
P E O P L E	CONTROL (CO-DECISION)	% assigned to citizens to decide a policy/decision Politicians: 40%; Citizens: 44%; Associations: 16%	
	PARTICIPATION (CO-CREACCION)	An experience like this one has allowed me to feel involved in political decision making	Average: 6.68 (1-10)
		I consider that this is a very important opportunity to give my opinion	Average: 8.05 (1-10)
		I am interested in participating in the planning of cultural and sports activities	Average: 7.41 (1-10)
		I would participate again in an experience like this one	Average: 8.73 (1-10)
	The system of discussion has allowed me to know others' opinions and share my own	Average: 5.36 (1-10)	
	LEARNING (FORMATION)	I have learnt a lot from this experience	Average: 7.14 (1-10)
FREEDOM (TOLERANCE)	% censored messages; % ideological intransigent messages	0%	
S O C I E T Y	SUBSISTENCE	With the current system of citizen participation, the representatives defend my interests	Average: 5.45 (1-10)
	COHESION	Other municipalities should incorporate this type of citizen participation	Average: 8.41 (1-10)
	EQUITY	The Administration informs society about the existing mechanisms of citizen participation	Average: 5.45 (1-10)
	SOCIAL WISDOM	This citizen participation initiative contributes to create a better society	Average: 7.73 (1-10)

**Do you believe that the indicators selected correctly define the attributes so as to evaluate effectiveness of the real life experience in Cadrete, Spain?**

### 3.2 Criteria efficacy

Table 8 shows the indicators and the value obtained in order to evaluate each attribute of the efficacy in the real life experience in Cadrete, Spain. The indicators selected are questions from the survey. The “Cadrete’s values” are the averages (mean value) of the scores given in the questionnaire by the citizens of Cadrete.

**Table 8.** Indicators and value obtained for the efficacy evaluation of the Cadrete experience

<b>CRITERION: EFFICACY</b>		
<b>ATTRIBUTES</b>	<b>CADRETE INDICATORS</b>	<b>CADRETE VALUE</b>
INFORMATION	The Administration informs society about the existing mechanisms of citizen participation	<b>Average: 5 (0-10)</b>
	The Administration informs society about the decisions taken	<b>Average: 4.7 (0-10)</b>
COMMUNICATION	Political powers take citizens’ opinions into account for the design of public policies	<b>Average: 5 (0-10)</b>
DECISION	The citizen has weight in political decision making	<b>Average: 5.15 (0-10)</b>
EXPECTATIONS	The citizen should participate in the design of public policies	<b>Average: 7.5 (0-10)</b>
	The citizen should decide together with the elected representatives the design of public policies	<b>Average: 7.15 (0-10)</b>

**Do you believe that the indicators selected correctly define the attributes so as to evaluate efficacy in the real life experience in Cadrete, Spain?**

### 3.3 Criteria efficiency

Table 9 shows the indicators and the values obtained in order to evaluate each attribute of efficiency in the real life experience in Cadrete, Spain. The indicators selected are questions from the survey. The “Cadrete’s values” are the averages (= mean value) of the scores given by the citizens of Cadrete in the questionnaire.

**Table 9.** Indicators and values obtained for the efficiency evaluation of the Cadrete experience

<b>CRITERION: EFFICIENCY</b>		
<b>ATTRIBUTES</b>	<b>CADRETE INDICATORS</b>	<b>CADRETE VALUE</b>
System Quality	In general, I liked the design of the software application	Average: 5.8 (0-10)
	In general, I am satisfied with the computer application used	Average: 5.95 (0-10)
<b>ATTRIBUTES</b>	<b>CADRETE INDICATORS</b>	<b>CADRETE VALUE</b>
Information Quality	In general, I am satisfied with the information that I received	Average: 6.9 (0-10)
<b>ATTRIBUTES</b>	<b>CADRETE INDICATORS</b>	<b>CADRETE VALUE</b>
Service Quality	In general, I am satisfied with the help of the support personnel	Average: 8.5 (0-10)

**Do you believe that the indicators selected correctly define the attributes so as to evaluate efficiency in the real life experience in Cadrete, Spain?**

#### **4. GENERAL FRAMEWORK**

**And finally, do you have any suggestion and recommendation for the proposed framework? Thank you very much for your attention and help.**

**Do you believe that the indicators selected correctly define the attributes to evaluate efficiency in the real life experience in Cadrete, Spain? Please classify the indicators according to the item which you think is the most suitable in the above table.**