

## Chapter 6

# A Quantitative Approach to Identify the Arguments that Support Decisions in E-Cognocracy

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### ABSTRACT

*E-cognocracy (Moreno-Jiménez, 2003, 2004, 2006; Moreno-Jiménez & Polasek, 2003, 2005) is a new democratic system that adjusts traditional or representative democracy to meet the needs and challenges of the Knowledge Society. If e-democracy is understood as the government of the people by means of information and communication technology (ICT), e-cognocracy is the government of knowledge and wisdom by means of ICT. This “social wisdom” is created in a cognitive constructivist way through the network by all citizens interested in the resolution of the considered problem (García Lizana & Moreno-Jiménez, 2008). To extract and share the knowledge associated with the scientific resolution of public decision-making problems, e-cognocracy must identify the arguments that support decisions by analyzing the messages and comments provided by the actors involved in the decision-making process through the collaborative tools used in the discussion phase. Therefore, this paper presents different decisional tools based on the quantitative values corresponding to the decision makers’ preferences, which are oriented to the identification of the outstanding comments. The arguments supporting the decisions made by the different actors are obtained, in a further step, from these comments by using text-mining techniques.*

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## 1. INTRODUCTION

E-cognocracy (Moreno-Jiménez, 2003, 2004, 2006; Moreno-Jiménez & Polasek, 2003, 2005) is a new democratic system that, along with the direct involvement of citizens in the decision-making processes, allows the extraction and diffusion of knowledge related with the scientific resolution of public decision-making problems associated with the governance of the society.

This *cognitive democracy* combines representative or legal democracy with participative or direct democracy. The former is carried out by the citizens' representatives and the latter by the citizens themselves. Results of both democracies are aggregated by using different weights that depend of the type of problem.

Taking into account the main idea of e-cognocracy, that is to say, the democratization of knowledge, this paper deals with the identification of the arguments that support the decisions made within this context.

To this end, we use a quantitative approach based on the priorities of the elements being compared. These priorities have been obtained using the Analytic Hierarchy Process (Saaty, 1980), AHP, one of the multicriteria decision-making methodologies that allows the incorporation of intangible and emotional aspects in the decision-making process and best captures the holistic vision of reality.

By combining these priorities and the quantitative information included in the messages and comments raised in the discussion stage of the e-cognocracy methodology (Moreno-Jiménez, Piles, Ruiz, Salazar, & Sanz, 2007, 2008), we identify the relevant comments or opinions that support the selection of the different alternatives considered in the resolution process. Finally, from these messages, the arguments that support the decisions made will be obtained by using text-mining techniques (Moreno-Jiménez, Cardeñosa, & Gallardo, 2009; Cardeñosa, Gallardo, & Moreno-Jiménez, 2009).

This work has been structured as follows: Section 2 briefly presents e-cognocracy and its stages; Section 3 explains how priorities are used in order to identify the comments that support alternatives; Section 4 includes a case study related to the construction of a leisure complex near the city of Zaragoza, Spain and finally, Section 5 highlights the most important conclusions.

## 2. E-COGNOCRACY AND STAGES IN ITS METHODOLOGY

E-cognocracy (Moreno-Jiménez, Piles, Ruiz, Salazar, & Sanz, 2007) is a new democratic model that tries to make more ambitious use of democracy than the mere election of political representatives. In this regard, based on the evolution of living systems (only species that learn and adapt to the context are able to survive), e-cognocracy focuses on the extraction and social diffusion of the knowledge derived from the scientific resolution of highly complex problems associated with public decision making related with the governance of society. This is a new democratic system that combines representative democracy with participative democracy to address the limitations of both, particularly, the lack of transparency, control and participation of representative democracy and the populism and lack of global perspective in participative democracy.

This cognitive democracy seeks to convince citizens by means of arguments and not to defeat them (e-democracy) by means of votes. To this end, e-cognocracy aggregates the priorities obtained from political parties (representative democracy) and citizens (participative democracy) by assigning different weights ( $w_1$  and  $w_2$ ) depending on the context of the problem (local, regional, national or supranational) and the objectives of the system. Its characteristics can be seen in Moreno-Jiménez and Polasek (2005) and Moreno-Jiménez, Piles, Ruiz, Salazar, and Sanz (2007).

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