

DECIDE 2.0 – A Framework for Intelligent Processing of Citizens' Opinion in Social Media

Elsa Estevez

United Nations University
Int. Institute for Software Technology
Center for Electronic Governance
P.O. Box 3058, Macao, China
+853 285040491
elsa@iist.unu.edu

Carlos Chesñevar,
Ana Maguitman

Department of Computer Science and
Eng. – Universidad Nacional del Sur
Av. Alem 1253
8000 Bahía Blanca, Argentina
+54 291 459 5135
{cic,agm}@cs.uns.edu.ar

Ramón Brena

ITESM Monterrey
Av. E. Garza Sada 2501,
Col. Tecnológico, 64849 Monterrey,
N.L., México.
+52 81 8358-2000 ext. 5246
ramon.brena@itesm.mx

ABSTRACT

Social media is one of Web 2.0 tools that governments are adopting for interacting with citizens. Through their use, citizens are able to share their views, react to issues of their concern and form opinion. However, despite the infusion of such tools in citizens' lives, governments face several challenges to fully benefit from their adoption. One technical challenge is the lack of automated intelligent tools for processing citizens' opinion in government social media. This paper presents a project - DECIDE 2.0, focusing on the provision of a framework, including a software tool, for overcoming such challenge. The aim of the project is to combine context-based search and argumentation in a collaborative framework for managing (retrieving and publishing) service- and policy-related information in government-use social media tools. For developing the framework, the research work is underpinned by artificial intelligence and software engineering techniques. The developed framework will be applied for the qualitative and quantitative assessment of citizens' opinion on a specific policy issue. A pilot test of the framework is planned to be carried out in collaboration with a local government. The project is executed by two universities in Argentina and Mexico.

Categories and Subject Descriptors

J.1 [Administrative Data Processing]: Government; I.2 [Artificial Intelligence]: Learning; H.3 [Information Storage and Retrieval]: Information Search and Retrieval

General Terms

Algorithms, Human Factors, Languages

Keywords

Social media; Government 2.0; Participation; Intelligent Tools

1. PROBLEM DEFINITION

In recent years, governments and citizens are adopting new Information and Communication Technologies (ICTs) for regular operations and daily issues, respectively. Governments are

adopting ICTs, such as wireless communication, artificial intelligence techniques, ubiquitous computing, radio frequencies identification (RFID), cyborg technologies, and closed circuit television (CCTV) to enhance services, reduce costs, provide new services, conduct more cost effective monitoring, and enforce regulations [1]. As Internet becomes more ubiquitous worldwide, new ICTs are being embedded in citizens daily lives - people all over the world are increasingly relying on social media for communication at different levels: with family members, colleagues at work, friends, and even with government officials.

Government 2.0 refers to government's adoption of Web 2.0 technologies to socialize government services, processes, and data [2][3]. Enabling new ways of communication such as those facilitated by social media, Government 2.0 provides new opportunities for government agencies to inform citizenry about service provision and be informed about citizens' needs and opinions through user-generated content available at social media, like MySpace, Twitter or Facebook, among others. In particular, government agencies can rely on such resources to improve communication with citizens, assessing public opinion in terms of social media data streams.

Despite potential benefits for governments, citizens and the society as a whole, the use of social media in government poses various challenges. For example, considering only the technical perspective, integrating data streams from social media requires solving two important issues. On the one hand, the magnitude of the information flow associated with such data streams (e.g. Twitter disseminates 55 million tweets a day) forces to rely on text mining and opinion mining techniques to filter noise and detect topics of community discussion. Usually, the use of such techniques is not a common government practice. On the other hand, social media data streams are usually incomplete, or potentially inconsistent, as citizens might have different views on a certain issue, resulting in different pro and con arguments. Therefore, such arguments have to be assessed and confronted against by government officials in order to be used as inputs in government decision making processes. In addition, decisions made need to be backed by arguments when informed to citizens in order to build trust in governments.

2. PROJECT DESCRIPTION

The overall goal of this project is to combine context-based search [4] and argumentation [5] in a collaborative system for managing (retrieving and publishing) service- and policy-related information in social media tools used by governments. We

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dg.o '12, Jun 04-07 2012, College Park, MD, USA
ACM 978-1-4503-1403-9/12/06.

contend that these two technologies –context-based search and argumentation– offer mechanisms better capable of fulfilling diverse information needs of government stakeholders - such as understanding citizens’ opinions and needs; while having the potential of disseminating valuable information particularly targeted to the various stakeholders’ categories. At the same time, such tools enable to discover and mine thematic- and opinion-based information provided by communities. Our proposed

research envisions a framework (DECIDE 2.0) based on a collaborative system operating on top of existing social networks. In this context, an important point is to be highlighted: the proposed model does not replace, but rather extends the current state of the art of web 2.0 technologies, by integrating existing social media tools with argumentation and context-aware technologies. Therefore, DECIDE 2.0 contributes to a more enhanced set of Government 2.0 tools.

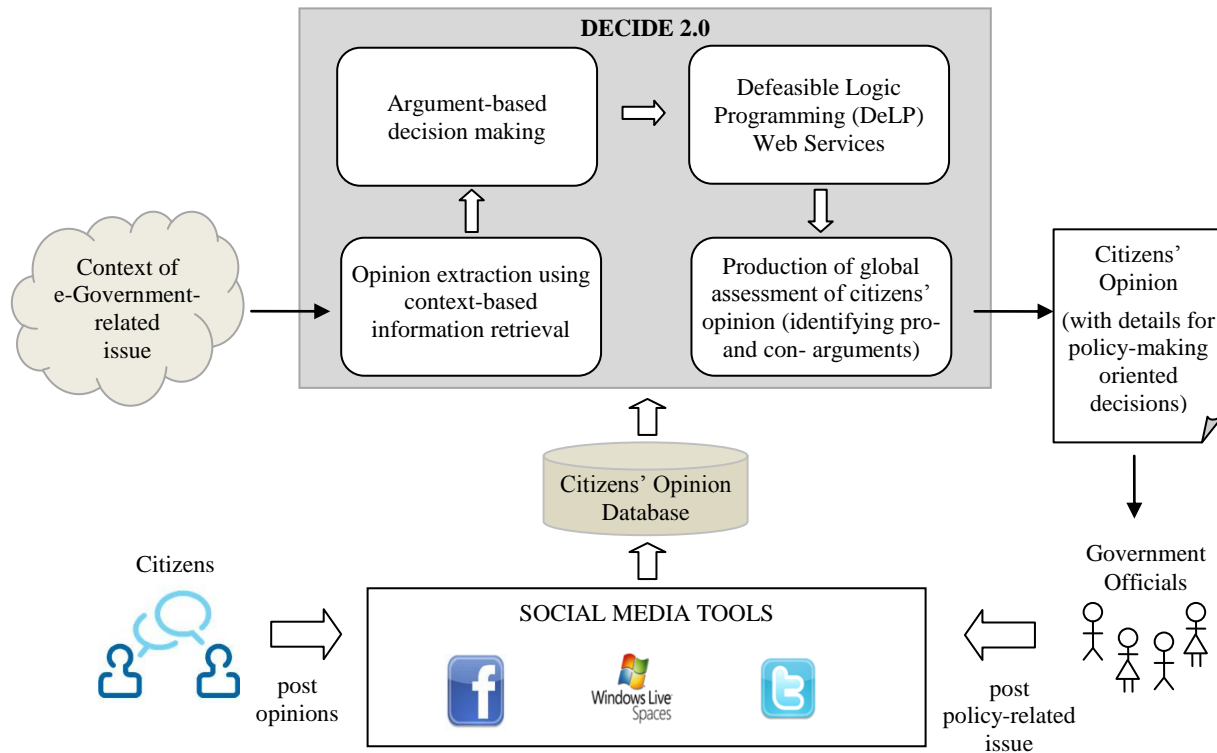


Fig. 1. DECIDE 2.0 Framework

Research on the proposed framework will lead directly to improved coverage, scalability and context-awareness with respect to the current model of information delivery and retrieval in social networks. Governments can greatly benefit from the proposed solution in twofold - by having adequate mining techniques to retrieve valuable information provided by citizens on social media, and by targeting different announcements to the appropriate group of government stakeholders.

In order to materialize the proposed solution, some important technical problems are to be solved, which are the specific goals of this proposal. Next, we identify a number of challenges that we intend to pursue as research questions within this project:

- Implement efficient models of trust and reputation propagation: users post information on social media whose reliability has to be assessed in order to effectively use such information for decision making.
- Develop algorithms for integrating information coming from different sources: several users may post messages related to the same topic; hence accrual of information needs to be modeled properly.
- Design effective context representations and community identification algorithms: when analyzing citizen opinions,

emerging communities have to be identified, and associated contextual information is to be obtained.

- Develop customized information models providing targeted information to various categories of stakeholders requires having different “views” of the issues under analysis.

3. ACKNOWLEDGMENTS

The research is funded by LACCIR (Latinamerican and Caribbean Collaborative ICT Research), Microsoft Research, CONACyT (Mexico) and Interamerican Development Bank (IDB).

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