CONCORDIA: Designing a Web-based Platform to Support the Management and Resolution of Territorial Conflicts

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Abstract. One of the main problems in maintaining relationships between government and citizens is the difficulty to solve territorial conflicts. In this sense, instruments that favor mediation and timely information are needed so that an adequate follow-up of the conflict lifecycle is possible. This paper presents a platform aimed at including the diversity of actors involved in a territorial conflict. The platform will store, organize, and retrieve information to provide a repository of information to adequately present it to actors interested in the state of the dispute at any given time through arguments and the documents backing up each party's stance. The paper also presents a preliminary design and first steps in the development of a Web-based platform for the management, resolution, and prediction of territorial conflicts

Keywords: Territorial Conflicts, Knowledge-based Services , Citizen Services, e-Government, e-Participation, Web-based platform, Conflict Management, Conflict Resolution, Conflict Prediction.

1 Introduction

Conflict is a polysemic concept that is commonly present in popular discourse including politics, scientific, and media. Humanitarian conflicts, including human rights, warfare, hunger, violence, epidemic, environmental, electoral, or ethnic conflicts represent a major and widely shared societal concern. Various disciplines, including sociology, political science, anthropology or ethics, have long and widely studied conflict, giving emphasis to both theoretical and practical issues. Within the wide variety of conflict types, one can distinguish those that have a significant and explicit spatial dimension, namely territorial conflicts. Political science has devoted its attention greatly to this specific type of conflicts from a Nation-wide perspective. Other groups have taken a politic-managerial logic to intra-national territories

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(conflicts between municipalities or other federal entities), or have focused on problems related to private property or the use of land (communal conflicts, rights of indigenous people, or rights of natives). Environmental issues have taken precedence and importance and conflicts of this type have generated social mobilization, judicial instruments, administrative agents, and significant economic impact.

Thus, the diversity, complexity, and typology of conflicts make this topic relevant today. One area of interest associated with the study of conflicts is the management and resolution of the differences and opposition among stakeholders. Researchers have developed several techniques, mainly at the individual and organizational level. In terms of territorial conflicts, and because of its social complexity, the methods used have led to processes of participation that are of deliberative and of public-action nature. Likewise, social stakeholders have developed strategies of persuasion, pressure, and coercion to meet their objectives, using space as a relevant dimension because space is a causal component (e.g., redefinition of the use of land or establishment of a pollution-prone industry) or because it constitutes in itself an instrument of pressure and coercion (e.g., street blockades or building takeovers). The evolution of and advances in the access to New Information and Communication Technologies (NICTs) allows various stakeholders in society to participate in a collaborative way in democracy [1], [2]. We know that NICTs have largely facilitated the collaborative creation of public policies between government agencies and society [3]. In a sense, various stakeholders in territorial conflicts have appropriated NICTs. We can identify a) citizen participation developments, b) applications and services designed to offer enhanced public administration, and c) services designed to facilitate social vigilance, like citizen observatories. These developments represent one type of innovation geared towards the management of conflicts and relationships among citizens, government, and territories. These developments provide an opportunity to transform conflict lifecycles in a significant way by means of allowing information access, fostering citizen participation, allowing record keeping and making stakeholders' negotiations and compromises public, ultimately resulting in the creation of a collective memory that could be useful in future conflict resolutions.

This paper presents the design and first steps in the development of a Web-based platform for the management, resolution and prediction of territorial conflicts. The paper is organized as follows: in section 2 we present theoretical foundations; in section 3 we present the design methodology; section 4 present the preliminary design of the platform; finally in section 5 we conclude the paper.

2 Theoretical Foundations

The components of the model of conflicts are: sources of information, relation with other conflicts, territoriality and three different types of actors; demanders, opponents, and mediators. There is an interdependence of the conflicts, actors, places and actions (e.g., polysemic) and different sources of information [5]. The conflict evolves in space and time [6]. To modify the perception of a conflict the practice of debate is necessary. The introduction of the debate will help to evolve the attitude towards avoiding conflicts to consensus and negotiation. Figure 1 shows a relational model.

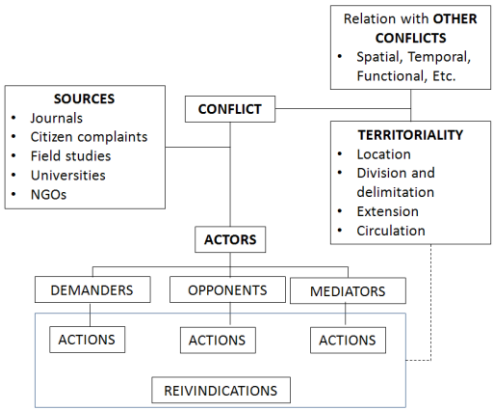

Fig. 1. Components of a Model for Territorial Conflicts

The lifecycle of a conflict and the needs and uses of information at different times is depicted in Figure 2.

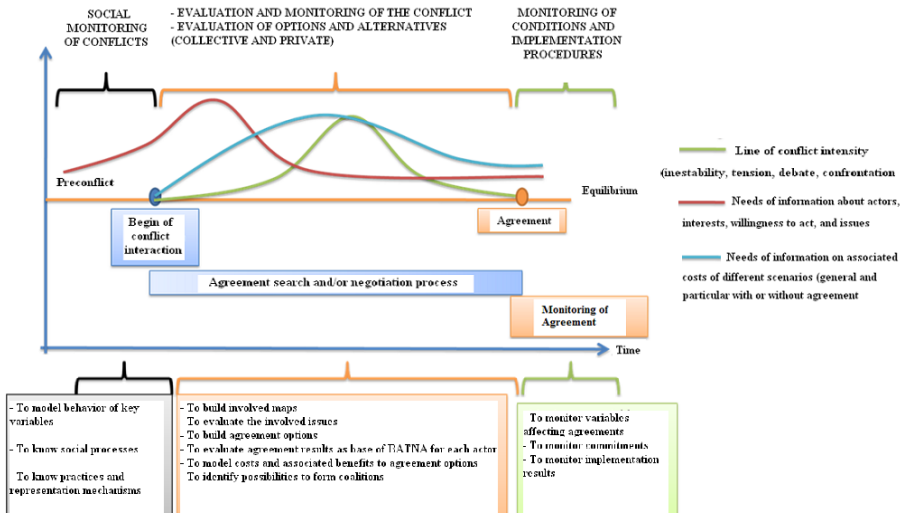

Fig. 2. Needs and uses of information during the lifecycle of a conflict.

2.1 Existing Citizen Participation Projects and Programs in Mexico

Citizen participation projects that include programs to promote community's quality of life, government portal usability, controlled housing development, community infrastructure improvement, and citizen participation in governance are lesser in

number. Table 1 detail the names and specific objectives of existing programs in Mexico related to territorial conflicts.

Table 1. Current Citizen Participation Programs in Mexico Related to Territorial Conflicts.

Project	Sponsor	Objective
The Pact: citizenship + government http://www.planjuarez.org http://www.pactoporjuarez.org Release: May 2001	Plan Estratégico de Juárez, AC	Promote community organization to improve the quality of life in Ciudad Juárez, Chihuahua
Citizen Observatory of Nuevo León's Web Official Portal http://www.nl.gob.mx Release: February 2006	• Secretariat of Finances • Social Communication (Government of Nuevo León)	Supervise the continuous improvement process of Nuevo León's Web Official Portal, in a joint effort between public servants and citizens
Public consultation for State Housing Bill of Nuevo León http://www.nl.gob.mx/?P=consulta_vivienda Release: June 2007	Housing Institute of Nuevo León	Regulate housing development in Nuevo León
Vigilant Taxi Driver http://www.chiapas.gob.mx/taxista-vigilante Release: March 2009	Secretariat of Transportation (Gov. of Chiapas)	To solve local problems of the community (such as street lighting, potholes, etc.) with the help of taxi drivers. While they're driving, they keep public order by sending reports trough mobile devices with 3G network
Public consultation for State Development Plan 2010-2015 of Nuevo León http://www.nl.gob.mx/?P=plan_desarrollo_presentacion Release: January 2010	Executive Office of Governor (Gov. of Nuevo León)	Create a strategy document that includes key actions to address the needs of the citizens of the state of Nuevo León
DesdeCantera.com http://www.desdecantera.com Release: June 2010	Social Communication (Gov. of Nuevo León)	Providing a platform for citizen proposals or bills
Public consultation for Sectorial Program of Sustainable Development: Nuevo León 2030 http://nuevoleon2030.nl.gob.mx Release: August 2010	• Secretariat of Sustainable • Fomerrey • Housing Institute of Nuevo León	Update the Urban Development Plan, considering housing and environment, to transform it into a State Program of Urban Development, Housing and Environment, that last in the long term
Public consultation for State Development Plan 2011-2016 of Tamaulipas http://tamaulipas.gob.mx/consultaped Release: March 2011	Gov. of Tamaulipas	Create a State Development Plan to establish the basis for state policies
Atención Ciudadana 070 http://www.ensenada.gob.mx/070	Municipal Gov. of Ensenada, Baja California	Speed up the process of fixing up street lightning, potholes, and garbage collection service.

In addition, in the European Union, a list of research projects related to e-Participation, e-Government, e-Democracy is found at [4]. Some are integrative

platforms, other are more focus on tools development. Furthermore, other are directed to increase e-democracy in young, seniors or low socio-economic status groups. From this review and according to our knowledge, there is not currently a platform for the monitoring and resolution of territorial conflicts. This is why is of paramount importance the design, implementation, and evaluation of a platform that can enable citizens, government, NGOs, the media, and other actors to interact with each other, in a public ambiance.

3 Design Methodology

Up to this stage, this work mostly comprises qualitative techniques to inform the design of the proposed platform. We next explain the stages of the methodology.

3.1 Stage 1: Preliminary Understanding of Conflict Resolution

The first stage of the study is aimed at providing an initial understanding of the phenomenon under investigation. With the help of experts in territorial conflicts, we hope to better understand the problem domain. Simultaneously, an extensive review of literature is needed to better contextualize the design and development of the software platform and to better situate the development of the platform. In this part, we will look for relevant literature in both domains: System Development (Information Systems) and Conflict Resolution (Social Sciences). Finally, this stage also aims at better understanding conflict through a conversation with NGOs, government agencies, and potential users.

3.2 Stage 2: Deeper Understanding and Initial Ideas for Design

This stage aimed at deepening our understanding of territorial conflicts by conducting phone-based semi-structured interviews with experts in territorial conflicts. Also, it includes a set of interviews with activists and NGO's representatives as well as people from the governments and media. This stage helped us to obtain a user profile of the system from the four different stakeholders identified at an event the authors have participated: Citizens, NGOs, Government, agencies, and the media. In addition, it has helped us identify the different tasks/actions taken by them during the course of a conflict. Finally, this stage has shed some light on the current communication processes and resolution practices as perceived by each of the stakeholders as well as an initial understanding of the implications of this research for a democratic society. In this stage we will translate the model from the Social Sciences into Information Systems.

3.3 Stage 3: Design and Evaluation of the Platform

Up until now, the design stage has not been fully completed. The design of the system will be web-based system with a potential to be deployed on mobile devices (e.g., Apps). The design process will be taking into account techniques inspired in participatory design. The summative evaluation of the system will be based on usability of the system as well as on a set of tasks that users will be asked to do. In addition, based on a qualitative study (e.g., interviews with users) we plan to assess the impact of this tool upon the society and the stakeholders.

3.4 Stage 4: Using the Platform

When the platform is ready, it will be used in a controlled setting, this could be in an University or a NGO, using data from existing cases. The objective of this stage is to improve the system through an iterative process on its actual usage.

3.5 Stage 5: Post-mortem analysis

This stage will start once the project has been deployed and the platform has served as a supporting platform in solving at least one conflict. This stage will be used to model the dynamics and structure of territorial conflicts when supported by technological tools. Through content analysis of the topics, posts, supporting documents, a set of reflections and understanding of these processes can be unveiled. Also, through the use of inferential statistics, some temporal patterns, correlations, and information of statistical significance could be found. We also plan to incorporate the analysis of topics and posts through machine learning techniques to automatically organize information and see whether important relationships emerge from the data such as temporal or theme-based patterns.

4 Preliminary Design

The preliminary design of the platform was achieved during different meetings with experts in territorial conflicts as well as authorities of the Monterrey Municipality. We next present the design process as well as some mockups of the platform.

Our first design was inspired in sites promoting online debate such as Procon.org and CreateDebate.com. We thought this could be a good beginning because conflict resolution needs the practice of debate. By using basic principles of usability we designed the first WEB site wireframes which is shown in Fig. 4. Due to space constraints we only present a few wireframes.

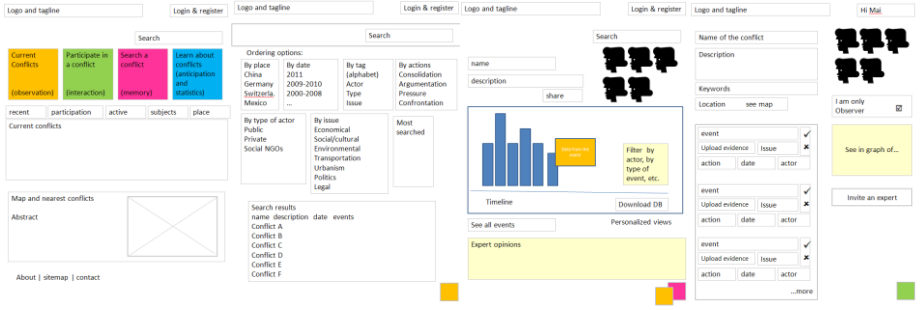

Fig. 3. Homepage -> Search page -> Conflict evolution -> Conflict participation.

Following Fig. 4. from left to right, the homepage of our platform is presented. Several filters, login and register options are shown. By selecting the observation functionality the user can search for current conflicts. If this option is selected the next wireframe page is open. The conflict search can be done by different fields. For instance, by place, date, tag, actions, type of actor and issue. The option of most searched conflicts is also activated. The results of the search are shown at the bottom of this figure. Next figure shows the time evolution of a particular conflict, the share option is enabled in this page. Events and expert opinions are also shown. In this page, the user can download all the event information for a particular conflict. Next figure shows how the user can interact, consult and participate in a particular conflict. Events, actions, date, actor and evidences of a particular conflict are available for the user. User can invite an expert to participate and decides her/his role (e.g., only observer).

As a result of our discussions with the stakeholders and experts in territorial conflicts, we identified some of the key requirements for a platform for management and monitoring of territorial conflicts. The platform needs are the following:

1. Instruments that favor the mediation, consensus and negotiation in an opportunistic way (timely) so the conflicts can be monitored.
2. Functionalities enabling argumentation.
3. The platform must storage, organize and provide information in logical and clear way to the actors or observers at any time and by means of arguments and documents.
4. The platform must be on the WEB (in a server or on the cloud), friendly, accessible and easy to visualize (e.g., based on information visualization science).

5 Conclusions

Territorial conflicts are important components of good governance. Political science has devoted its attention greatly to this type of conflicts. These types of conflicts have generated social mobilization, judicial instruments, administrative agents, and

significant economic impact. The diversity, complexity, and typology of territorial conflicts make this topic relevant today. One area of interest associated with the study of conflicts is the management and resolution of the differences and opposition among stakeholders. In terms of territorial conflicts, and because of its social complexity, the methods used have led to processes of participation that are of deliberative and of public-action nature. Furthermore, the use of ICTs has largely facilitated the collaborative creation of public policies between government agencies and society. In this paper, we present the design and first steps in the development of a Web-based platform for the management, resolution and prediction of territorial conflicts. We believe that such platform will provide the following benefits: a) to provide believable, on time and trustful information to the conflict actors, b) to inform better to the conflict actors, c) to enable the creation of new services based on knowledge about the citizen participation in territorial conflicts, d) to observe the use of the territorial surface from the social perspective.

This paper presented a preliminary effort toward the creation of Web-based platform that can be used to support to the resolution of territorial conflicts. Future work includes the implementation of this platform as well as an evaluation with actual users and post-mortem analysis.

6 Acknowledgements

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