Democratic Citizenship Community: a social network to promote e-Deliberative process

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ABSTRACT
Social networks, such as virtual communities, permit connections between citizen and government. Integrating consultative and deliberative environments for popular participation in democratic issues and creating virtual communities for warranting better relationship among members make it possible to model decision-making processes. For this reason, the Democratic Citizenship Community (DCC) was developed, based on the Government-Citizen Interactive Model. The DCC has interaction and communication resources such as citizens’ profiles, debate, voting, information library, socialization space and users’ help. This research analyzes the DCC social network in a pilot case study and presents initial discussions about this system.

Categories and Subject Descriptors
H.5.3 [Group and Organization Interfaces]: Web-based interaction

General Terms
Design, Experimentation, Human factors

Keywords
social networks; e-government; decision-making; virtual community

1. INTRODUCTION
The web has proved to be an effective source of information and a powerful tool for communication in modern society. In times of Web 1.0, the focus was the interconnection of documents, pages and machines. Now with Web 2.0, it is searched more than that, linking up people, organizations and concepts [15]. In Web 2.0, the production and publication of content as well as responsibility for them is in the hands of users, connected to the Internet according to their interests.

With the evolution of the Web, users have the ability to modify and create new contents directly in browsers without the need for additional tools. By means of the so-called social softwares [18], people are connected, communicating and sharing contents and knowledge via computer. Among these softwares, there are blogs and wikis, which allow content creation collaboratively. Being improved the speed of Internet accesses, systems that use audio and video have been created, such as YouTube and Slideshare.

This gathering of ideas and resources concerning a group of independent users’ shared interests is called a social network. Among the social networks there is a particular category, so-called virtual communities, in which users do not necessarily cohabit in the same geographical region, as communities established in real life, but they share common interests. Orkut, Facebook and MySpace can be classified in this category, which has attracted much attention from Internet users. Orkut, for example, was launched in the United States, but Portuguese-speaking Brazilians quickly became the dominant user group [3].

The Social Web aims at considering special issues that arise with the formation of groups in such environments. As the man is, in essence, a social being, his presence in the web environment and the complexity of modeling systems that represent human relationships in the real world are great challenges. Besides, it should be remembered that the development of Information and Communication Technologies cannot be separated from discussions on ethics and social commitment.

Considering the aforementioned facts, what are the interests of citizens who join virtual communities, using the Internet as a tool for debating and voting on issues of public interest? How should an environment with e-deliberative purposes be modeled? What should its components be like? In a preliminary diagnostic evaluation, it was observed that the current virtual communities (VC) have many social characteristics, without focus on democratic debate, and do not stimulate the participation of citizens in decision-making in combination with the government.

This research uses the Government-Citizen Interactive Model [9], which encompasses the different phases in a consultative and deliberative process. In general, the process begins with the government (the administrator) defining the type of popular manifestation and the activities schedule. For socializing citizens, we propose the creation of a virtual community, structured according the type of manifestation, location and theme. This way, the model’s components are integrated, such as debate, voting, socialization space, digital library and user assistance. The debate phase, especially, requires a structure that permits discussing demands (topics to be debated on): registering opinions leads the citizen to justify his or her vote, indicating, furthermore, if his or her opinion goes against or for what is being discussed, or even if it is rather neutral. Justifications are thus classified and remain available for consultation. Eventually, citizens vote.

Therefore, Democratic Citizenship Community (CDC) was projected [10], developed and tested, based on the Government-Citizen Interactive Model. This research analyzes the DCC social network in a pilot case study and presents initial discussions about this innovative e-democratic application.

2. SOCIAL NETWORKS AND VIRTUAL COMMUNITIES
A social network is the set of actors (e.g. people or organizations), which are nodes of the network, and relationships that link the nodes [1]. Social network indicates the ways in which actors are related [6].
The evolution of the social network depends on the mutual experience, knowledge, relative interpersonal interests, and trust of human beings [6]. According to [3], what makes social network sites unique is not that they allow individual to meet strangers, but rather that they enable users to articulate and make visible their social network.

According to Matt Webb [18], a social software is one that allows people to connect through Computer-Mediated Communication. As elements of a social software, the author cites:

- Identity: there is the possibility to identify each person in the system.
- Presence: you can see who is online, available or otherwise nearby.
- Relationships: it is possible to identify how two users of the system are related.
- Conversation: you can talk to other people through the system.
- Groups: communities of interest are built up.
- Reputation: you can know the status of other people in the system (who's a good citizen? who can be trusted?).
- Sharing: it is possible to share things that are meaningful to participants (like documents, photos or videos).

We have added to this list of elements another one:

- Recommendation: it is possible to indicate the quality of available contents.

Virtual communities, as social softwares, must have these elements. The virtual communities are an extension of the communities in the real world, however there is no a direct relation with the geographic localization of the involved members, but a union for common interests. VC’s enable and support the communication between people who are in different places and on different schedules [20]. According to [7], a VC is defined as a group of people interacting predominantly in cyberspace for their own common interests, relationship building, transactions, and fantasies.

The challenge for the use of virtual communities is that these are not always capable to keep the same level of collaboration, motivation and involvement of the real communities. Developers of virtual communities must simultaneously deal with communication, motivation, leadership, and technology [7].

A virtual community must possess four elements that characterize [5]: the clear definition of the group; the interaction between the members; the linking between the members, and the exchange of information in a common place. In relation to citizens’ sociability on the web, VC’s are used to reinforce human interaction in order to construct knowledge. VC’s have caused changes in society, modifying people’s life in social aspects, in relation to technological innovation, as a communications medium and permitting the exchange of experiences.

According to [2], virtual communities tend to establish an area of negotiation for different subjects / civil society groups and stimulate a reflective and collaborative audience. The question of engaging large numbers of people in e-Voting and/or e-Participation was the central issue to all of the discussions and plans about the future of e-Democracy [16]. In this sense, it is believed that such communities should be used for e-democracy, in e-Deliberative processes.

Deliberation is possible in small communities (with up to a hundred people) and in bigger communities (with more than a thousand people). In both cases, it is necessary to exchange knowledge and confidence among members [19]. Therefore, through the creation of small groups of interest for citizens with similar mentalities, in which there is mutual understanding and a high level of reliability, it is possible to develop the necessary influence for national campaigns.

However, it is important to say that the characteristics of online tools (the impact of anonymity, absence of physical presence, the written nature of the exchanges and others) and the practices concerning mediation (new expert in the loop, webmasters, moderators and others) contribute towards the resurgence of the old problem of the establishment of the link between the deliberation and the decision: the identification of transmission, diffusion and translation processes [13].

Considering these references, among others, this research investigates VC’s modeling for e-democratic purposes and conducts a case study using an original system to test this model. The proposed model is shown in the next section.

3. GOVERNMENT-CITIZEN INTERACTIVE MODEL

This section comprises a description of the Government-Citizen Interactive Model [9], developed with a view to organizing consultative and deliberative processes with e-democratic purposes. The main characteristics of this model are the differentiated debate structure, the moderator’s participation, the possibility to vote on the debated issues, and the formation of a virtual community for socializing its users.

The model is structured in stages and activities [9], which are not mutually exclusive. These may or may not be taken into consideration in the development of a web environment with such purposes. The proposed stages are: initiating the process, creating a virtual community of citizens, registering demands, conducting a consultative debate, clustering demands, voting, and deliberating.

Distinct methods to promote citizen participation in decision-making can be adopted by countries, including referenda, public hearings/inquiries, public opinion surveys, negotiated rule making, consensus conference, citizens’ jury/panel, citizen/public advisory committee or focus group [17].

According to the model, citizen’s participation in a community in a certain e-deliberative process is structured with respect to regions and themes. These citizens can submit their names as moderators. Registered citizens will be allowed to post demands that interest them, which will be discussed in the debate environment, according to a previously-arranged schedule. The debate is organized as it is proposed in Democratic Interaction Language – DemIL [9], which classifies opinions, with their respective justifications, in the categories ‘for’, ‘against’, and ‘neutral’. Moderation activities in the debate are to be carried out by the citizens who proposed to do so. Due to the way it is structured, recovering information in the environment is easy, as
well as analyzing data quantitatively and statistically. After this phase, members are stimulated to vote, in definite turns. When the voting period is over, results are deliberated. It is suggested that there should be a socializing space for users to get to know one another; also, in order to exchange information in other formats of digital files, there ought to be a digital library. In the model, the government, preferably, is supposed to manage the system.

It is very important to consider the participation model [17] that is to be adopted to adapt this model, once there are specificities when carrying out, for example, a popular consultation like a referendum or like a focus group. The model must also incorporate non-functional characteristics that are vital for a governmental application, such as usability [14], accessibility, security, and data privacy.

![Figure 1. Government-Citizen Interactive Model [9].](image)

The components of the Model for a Virtual Community have clear functions, as presented in Figure 1. The components for consulting and voting are [9]:

- **Citizen’s Profile:** the initial step is the formation of the Community that is nothing but the insertion of the individuals in the virtual world, by registering their profiles. These profiles allow that the demands are extensively worked and geographically and thematically distributed. This distribution can be compared to the existence of ‘virtual rooms’ in chat rooms, which organize the virtual space, and allow the exchange of information among the components of the group. The geographic and thematic distribution is predefined conforming to the governmental management.

- **Registering demands:** the citizens who participate in the community must register their demands, that is, the issues they want to debate in the ongoing deliberative process. It is important to say that demands are also categorized into themes. Regarding the way a demand is written, there is one restriction: it must be put into words so as to permit the citizen to vote against, for or neutrally towards the demand.

- **Participating in the DemIL Debate:** through this component, citizens can exchange information, one of the primary characteristics of a democratic debate. In the DemIL Debate component, a forum structured with specific characteristics is modeled. In this forum, previously registered demands according to location/theme are discussed and foment opinions (arguments), which in turn can foment other opinions (counterargument); this characterizes a democratic exchange. An opinion has the following attributes:
  - Author: citizen who posted the opinion;
  - Date: record of the date of the posted opinion;
  - Hour: record of the hour of the posted opinion;
  - Type: An opinion can be a justification to a demand, that is, an argument, and also suffer the moderator’s interference.
  - Justification: request for the citizen’s position, in which he or she classifies the textually registered opinion as ‘for’, ‘against’, or ‘neutral’ in relation to the demand.
  - Motivation: the moderator can interfere in the opinions posted in the debate. Citizens who have a more active political commitment usually act as moderators. The moderator interferes only when necessary and may explain his or her interference textually. Four types of interference to be employed by the moderator were proposed, based on the Discourse Theory [4], in relation to discourse mistakes: unclear opinion, inconsistent argumentation, excessive generalization and thematic deviation. In order to vouch for compliance to the terms of use, another type of interference was proposed: disrespect to the terms of use.

Another way to motivate participation in the debate would be moderators posing questions to users, but this strategy is not investigated in this paper. See Figure 2, which represents DemIL Debate.

Opinion clustering is part of the proposed model, but it was not implemented in this research.

![Figure 2. DemIL Debate.](image)
- **Information Library**: the citizen needs to have access to the information in distinct media, so that he or she can think and vote conscientiously. Both the government and the citizen can display documents and links that refer to the discussions.

- **Socialization Space**: the inclusion of socialization spaces, such as chats, board or coffee-bars, where members can get to know each other better, which motivates and integrates the members of the VC.

- **Deliberation**: Eventually, it is deliberated what was chosen by the community. The deliberative result can be presented in a formal document, a technical report on the popular manifestation.

- **Users’ help**: the citizen can solve his doubts in relation to the tools used and/or to the ongoing process. The help can be, among others, contextual, by topics or by means of a FAQ (Frequently Asked Questions).

The proposed model will be tested in the Democratic Citizenship Community, presented in the next section. In order to model the application, we searched the Web for consultative and deliberative environments, analyzing both domestic and international e-government initiatives [8]. The e-participation proposed in this research is an original system, considering aspects of social networks.

4. **DEMOCRATIC CITIZENSHIP COMMUNITY**

Specially based on the Government-Citizen Interactive Model, the Democratic Citizenship Community (DCC) was specified [10], implemented [11] and tested. This section presents aspects of these last two stages of the DCC system.

Before presenting the DCC system, it is important to say that the functional and non-functional requirements established for this kind of application were previously elicited and the interfaces were initially projected and tested [10].

The access to the system occurs at the web address http://www.comunidadedcdc.com.br/ (system in Portuguese, acronym: CDC). In the homepage the user can login to the DCC or register as a new user. The opening text informs: ‘DCC is a place to discuss matters of common interest which supports voting. Get informed, post your opinion and help decide’. See the DCC homepage in the Figure 3, below.

In the «Debate» link, after choosing the manifestation he or she is interested in, the user can «Register a new topic» to be discussed at the DCC, warranting the consultative process. Also in the «Debate», previously registered demands are discussed. See the Figure 5, below.

The system administrator visualizes the DCC differently, since he has distinct functions. He can register and manage the calendar using the schedule created in the environment; register the regions and theme propositions where consultation and deliberation will take place; define the type of manifestation (referenda, public opinion surveys, focus group, among others) when the process opens; register messages to be sent to citizens, notifying them of process date and final result date; and define data viewing strategies for discussion and voting. For such purpose, he has, in addition, the option «administration» in his tool bar, which also permits the access to the users log register.

The citizen profile shows the main pieces of information about him or her, such as profession, city and e-mail. The scheduled manifestation is presented in the citizens’ profile and demands are listed and divided into themes, so that it is possible to debate and/or to vote for them in the previously scheduled period. This schedule determines the deadlines for opening the debate, voting and finishing the activities.

See the citizen’s profile in the Figure 4, below.

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![Figure 3. DCC – Homepage.](image)

After registering or logging in to the DCC, the user is directed to his/her Profile. The DCC has interaction and communication resources, accessible by links in a tool bar, such as citizens’ profiles, debate (demands register and discussion), voting, information library, social space and users’ help.

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![Figure 5. DCC – Register a New Topic.](image)

According to the DemIL language, in the «New debate» box the citizen must post his or her opinion or comment, choosing an option that defines his or her vote: for, against, or neutral in
relation to the discussed demand. This post is added at the end of the list of the existing posts.

The moderator responds to these opinions in debate by means of specific types of interference, when he identifies unclear opinions, inconsistent argumentation, excessive generalization, thematic deviation and term of use infraction [9]. Such interferences are operated textually and are available in a list of options for selection. The moderator has access to a different display of the demands he moderates. In this case, there is a «Moderator» bar, which gives access to the options of types of interference and a field to justify it. See Figure 6.

![Figure 6. DCC – Moderator.](image)

After the discussion period, when the voting process is opened, the citizen decides on his/her final vote, in the «Voting» link (see Figure 7). It is possible to post a justification for the vote.

![Figure 7. Demands Voting.](image)

For the citizen to obtain information, in order to be up-to-date when opining, there is a Digital Library with web links, which are registered according to thematic categories. See Figure 7.

![Figure 8. Digital Library.](image)

In the «Socialization Space» the citizen visualizes other members’ profiles, sends invitations to potential new members, publishes a piece of news in a board or simply visualizes this board. See the socialization space in the Figure 9.

![Figure 9. Socialization Space.](image)

The DCC also has a help menu, structured by means of FAQs (Frequently Asked Questions), to clarify users’ doubts about using the environment.

## 5. CASE STUDY

The used methodology for the DCC implantation and the data analysis of the pilot case study are presented in this section.

### 5.1 Methodology

Considering the Government-Citizen Interactive Model, a «Public Consultative Committee» manifestation was registered and a schedule was designed in the system establishing the phases of the consultative process. For the use of the DCC, the following phases were defined: 1) Registration of participants; 2) Registration of participants’ demands; 3) Debate of opinions regarding the demands; 4) Voting; 5) User satisfaction survey; and 6) Deliberation of results. As suggested by users, the word «topic» replaced «demand» in the DCC’s interfaces. However, «demand» is kept in the analyses.

During the initial contact between the user and the DCC, when enrolling, he or she registers his or her interest in acting as a moderator. After users register demands, moderators are allocated
by the administrator according to themes. When enrolling, the user has access to the terms of use of the DCC, and it is necessary to agree with them to fulfill the enrollment.

The schedule for the «Public Consultative Committee» manifestation was designed to be completed in 20 days: 15 destined to debating and 5 to voting. The request to participate in the experiment was sent by e-mail, through the graduation and post graduation lists of the institutions involved in the research. During the deliberative process, four warnings were sent to participants’ mailboxes by the system, with a view stimulating participation in the discussions, explaining the moderators’ role, reminding of the voting period, and demanding the fulfillment of the user satisfaction survey. Throughout the process, many e-mails from the users were answered, solving general doubts about the application and expressing gratitude for compliments, criticisms and suggestions sent to the administration.

After implementing and, consequently, managing the DCC in a practical case, the data were analyzed by means of usage statistics, with the aid of the analysis of log registers in the administrator’s view, Google Analytics tool and a survey made with the participants in the end of the process, so as to verify their satisfaction regarding the DCC.

## 5.2 Data analysis

This section analyzes the DCC users’ demographic profile, their degree of interest in diverse aspects of debating, voting and others environments, as well as the satisfaction of use attested by the DCC members. Due to the small extent of the sample, data were not statistically presented.

### 5.2.1 Demographic profile

The sample was composed of volunteer undergraduate and graduate students of the universities involved in the research: UFF and UC. It applied to a consultative and deliberative process, according to interests of the institutions. As the application presented the option «Invite a friend» in the socialization space, there were also external participations.

Seventy-six individuals were interested in getting to know and taking part in the DCC, fulfilling the enrollment form. Among them, 67 were from Brazil and only 9 from Portugal. The participants’ average age is 30 years old; 88% are students; the remaining are teachers. It is believed that this difference is due to the voluntary aspect of the participation, to individuals’ particular interests on specific issues and to the difference between the countries’ academic calendars. Another factor to be considered is the «social presence», since most of the Brazilians who were personally involved knew the research executor, collaborating with the experiment.

### 5.2.2 Registers in debate

Nine issues were suggested by 8 different users to be discussed in relation to the themes registered in the system (a member suggested 2 issues). There was greater interest on education, but there were also polemic topics, such as foreigners’ deportation, which was at that time being discussed by different media, and abortion, which has already been a referendum issue in Portugal. In general, demands were well-written by their authors, promoting the exchange of ideas and favoring the debaters’ positions.

Registered demands (with the respective acronyms) are presented in Table 1.

<table>
<thead>
<tr>
<th>Demand’s title</th>
<th>ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space of socialization for students</td>
<td>D1</td>
</tr>
<tr>
<td>Reciprocity in Europeans’ deportation</td>
<td>D2</td>
</tr>
<tr>
<td>Academic publishing</td>
<td>D3</td>
</tr>
<tr>
<td>Support to access to higher education</td>
<td>D4</td>
</tr>
<tr>
<td>Is there life during post graduation?</td>
<td>D5</td>
</tr>
<tr>
<td>Distance Education – a solution to democratize Brazilian education</td>
<td>D6</td>
</tr>
<tr>
<td>Compulsory voting</td>
<td>D7</td>
</tr>
<tr>
<td>Abortion – for or against?</td>
<td>D8</td>
</tr>
<tr>
<td>Good healthcare system should be for free</td>
<td>D9</td>
</tr>
</tbody>
</table>

When the citizen registers a demand, he or she needs to register a description of it, so as to permit a clear discussion, in which participants can be for, against or neutral, as it is proposed in Government-Citizen Interactive Model. See the descriptions of the demands in the Table 2, below.

<table>
<thead>
<tr>
<th>ID</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>Students need a social gathering space with basic infrastructure within universities where they can meet and rest and do other things. <em>(sic)</em></td>
</tr>
<tr>
<td>D2</td>
<td>What is your opinion regarding the use of ‘reciprocity’ to deport foreigners who arrive in other countries? <em>(sic)</em></td>
</tr>
<tr>
<td>D3</td>
<td>Assessment by the Ministry of Education (CAPES) does not consider publications in events that are not included in the Qualis classification. Knowing that there are excellent events that are not catalogued in the Qualis system, would it be ideal to publish only in Qualis-stamped events? <em>(sic)</em></td>
</tr>
<tr>
<td>D4</td>
<td>Since federal universities have limited entry, the government should fund admissions in private institutions that have vacant spots. <em>(sic)</em></td>
</tr>
<tr>
<td>D5</td>
<td>Post graduation students should dedicate a few moments per week to culture and leisure despite the intensive pace of their studies. <em>(sic)</em></td>
</tr>
<tr>
<td>D6</td>
<td>Brazil is a country of continental dimensions. Studies conducted by the Ministry of Education indicate that, by 2010, there will be demand for 22 million students. It is impossible to build enough schools for this many people or for the number of existing students in order to supply this demand. Investment in technology could supply this demand since technology is cheaper than creating physical structures. <em>(sic)</em></td>
</tr>
<tr>
<td>D7</td>
<td>Although voting is an important moment to exercise citizenship, I believe that voting should not be mandatory and absentee should not receive punitive measures. <em>(sic)</em></td>
</tr>
</tbody>
</table>
Table 2. Descriptions of the demands (cont.)

<table>
<thead>
<tr>
<th>Demand</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D8</td>
<td>Do you agree with decriminalizing induced termination of pregnancy if voluntarily performed during the first weeks of pregnancy in a legally authorized health establishment? (sic)</td>
</tr>
<tr>
<td>D9</td>
<td>Public hospitals often exist in terrible conditions. In order to change this situation, more investment should be prioritized to public healthcare. (sic)</td>
</tr>
</tbody>
</table>

Opinion posts for each of them and debaters’ positions (for, against or neutral) are presented in Table 3. Even if a user had already posted an opinion and then decided to do it again, both posts were taken into consideration.

Table 3. Posts by topic in the DCC

<table>
<thead>
<tr>
<th>ID</th>
<th>Opinion posts</th>
<th>For</th>
<th>Against</th>
<th>Neutral</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>22</td>
<td>21</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>D2</td>
<td>19</td>
<td>7</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>D3</td>
<td>9</td>
<td>4</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>D4</td>
<td>9</td>
<td>-</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>D5</td>
<td>8</td>
<td>5</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>D6</td>
<td>17</td>
<td>13</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>D7</td>
<td>14</td>
<td>7</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>D8</td>
<td>5</td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>D9</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

In relation to the debates, it is noteworthy that the visibility of others’ opinions and positions stimulated the debate at times; sometimes, however, it inhibited users’ opinion posting. Labeling positions as ‘for’, ‘against’ and ‘neutral’ is positive, because it allows users to make a decision and ideas to be discussed, which is good for the debate. One notes that some demands, such as D5 and D9, facilitated a favorable view due to the bluntness proposed for the discussion.

Some considerations can be made regarding the discussions. Most users registered a single opinion. Demand D1, to which most people were favorable, presented animated discussions. The only person displaying a neutral position wished to question the management of existing social spaces in some universities, which are sometimes poorly used. D2 presents an issue that is currently debated in the media – the principle of reciprocity in the deportation of foreigners – which stimulated opinions and positioning among members. In D4, most users were shown to be against the redistribution of federal university vacancies. A single member presented a neutral opinion, questioning the implementation of this type of system. While most members positioned themselves ‘for’ the D5 issue, one member declared him/herself neutral but voiced an opinion that seemed favorable to the demand. In D7, the use of negative writing in the description of the topic could confuse the user, especially when considering the title of the topic ‘mandatory voting’. One user claimed to be ‘for’ the issue but expressed an opposite view. Another user detected this mistake and notified the DCC administration and the user, who deleted the comment and correctly posted a new one. Demands D8 and D9 were registered while voting was already open; perhaps they received less entries for this reason. The moderator’s role in the debate is analyzed in [12].

It is important to saw that, in debates, there is an interpretative flexibility depending on the way a demand is written, which influences opinion posting and may lead the user to vote for, against, or neutrally in relation to a demand. A certain degree of knowledge of the discussed topic is also necessary so that the participant can influence the discussion and consequently others’ opinions. Therefore, if a debated opinion can be understood in several manners, as well as participants’ knowledge and attitude towards the debate, these may obstruct the use of these VC’s, as it is proposed in this paper.

5.2.3 Registers in Vote

Data on the interest in voting, summarized, are presented in Table 4.

Table 4. Votes posted in the DCC

<table>
<thead>
<tr>
<th>Demand</th>
<th>Votes post</th>
<th>Against</th>
<th>For</th>
<th>Neutral</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>12</td>
<td>-</td>
<td>12</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>D2</td>
<td>9</td>
<td>2</td>
<td>7</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>D3</td>
<td>7</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>D4</td>
<td>13</td>
<td>9</td>
<td>3</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>D5</td>
<td>10</td>
<td>-</td>
<td>8</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>D6</td>
<td>9</td>
<td>3</td>
<td>6</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>D7</td>
<td>12</td>
<td>3</td>
<td>8</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>D8</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>D9</td>
<td>3</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>3</td>
</tr>
</tbody>
</table>

The voting confirmed the views of members about the demands being discussed. An overview of all opinions and positions for both ‘Debate’ and ‘Vote’ confirms that users tend to have positions similar to their previous opinions.

On average, four justifications were posted by demand in the voting stage, and, as a whole, three were considered invalid.

5.2.4 Interest in the other environments

The library has eight links posted by five different members, offering digital content related to the discussed topics. The topics to which the links related were D1 (1), D2 (2), D6 (2), D7 (2) and D8 (1). According to access data and Google Analytics tracking, 33 members visited the information library.

The socialization space had three pieces of news registered information library, one related to a scientific event and two on cultural events. Regarding the call for participation in the DCC, 17 invitations were sent. 27 accesses to members’ profiles happened showing that users were interested in who held each opinion.

The help has been accessed by 18 users, as Google Analytics records, but it is not know exactly if it is due curiosity or to doubts. It was noticed that some users prefer to send general questions to the administration, by e-mail, instead of using the Help Menu. Most of the questions sent by e-mail were answered directly in the DCC, through the insertion of a FAQ that solved such doubts.
5.2.5 User satisfaction survey

By means of an online survey, thirty participants eventually filled in a user satisfaction survey, regarding their experience in the DCC. See a page of one of the online surveys in the Figure 10 below (in Portuguese Language).

The Model sought to structure a deliberative process in stages to facilitate decision-making. By means of DCC, the users tested this structure and 91% agreed that it made decision-making easier, while merely 9% disagreed.

The possibility of participating in a scheduled debate with other participants was beneficial for the discussions. A user commented that ‘...I think an interesting option would be to allow a person to select topics of greater interest and receive periodical emails notifying if opinions were posted in these topics, because or else it becomes too loose, and the user forgets to keep checking’ (sic).

When asked if ‘the participant positioning him or herself ‘for’, ‘against’ or ‘neutral’ benefits the posting of comments’, 83% agreed, 13.4% disagreed, and 3.3%, i.e., one user, expressed no opinion. On the other hand, 73.4% disagreed that this system inhibits standpoints on discussed topics, while 26.6% have the opposite opinion, i.e., that taking stances may inhibit the posting of comments.

Regarding the importance of other people’s opinions in influencing the final vote, 16.7% strongly agreed with this statement, 30.0% agreed, 33.3% disagreed, and 13.3% strongly disagreed, while 6.7% expressed no opinion. In the former statement, users were shown to be divided; however, concerning the statement ‘The participant may express a different opinion throughout the process’, 93.4% agreed, which leads us to believe that the consultative process may indeed influence the final vote.

For 89% of users, the time spent in the consultative and voting processes was sufficient for deliberation; in other words, there was enough time to make a decision about the debated issues. A user stated that ‘The debate intensifies with time and with the relationship that becomes established between people due to their posted opinions’ (sic).

An 80% agreement rate was obtained in the statement ‘The library of information allows the user to know what is being discussed in real time, in order to prepare an opinion’, attesting that this space is useful for the debate. As for the statement ‘The social space makes it possible to know who the other community members are and to seek means to socialize with them’, 80% of users agreed with this statement.

When asked if the phrasing of certain demands created difficulties, members answered according to the Table 5 presented below.

<table>
<thead>
<tr>
<th>Difficult to</th>
<th>Yes</th>
<th>No</th>
<th>I don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understand</td>
<td>46.7% (14)</td>
<td>50.0% (15)</td>
<td>3.3% (1)</td>
</tr>
<tr>
<td>Discuss</td>
<td>30.0% (9)</td>
<td>66.7% (20)</td>
<td>3.3% (1)</td>
</tr>
<tr>
<td>Vote</td>
<td>26.7% (8)</td>
<td>66.7% (20)</td>
<td>6.7% (2)</td>
</tr>
</tbody>
</table>

In general, participants did not encounter difficulties, though a rate of 46.7% for the category ‘understanding’ is high and indicates that there were difficulties. We believe that during discussion and voting, which both obtained a rate of 66.7%, this problem was mitigated, since the discussion makes it possible to eliminate doubts by exchanging ideas with other users.

Participants evaluated the project and the use of the application for debating and voting as it is presented in Table 6. The criteria are E (Excellent), VG (Very Good), G (Good), R (Regular) and (Poor).

<table>
<thead>
<tr>
<th>Evaluated items</th>
<th>E</th>
<th>VG</th>
<th>G</th>
<th>R</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Layout</td>
<td>23.3% (7)</td>
<td>26.7% (8)</td>
<td>43.3% (13)</td>
<td>6.7% (2)</td>
<td>0.0% (0)</td>
</tr>
<tr>
<td>Usability</td>
<td>20.0% (6)</td>
<td>20.0% (6)</td>
<td>53.3% (16)</td>
<td>3.3% (1)</td>
<td>3.3% (1)</td>
</tr>
<tr>
<td>Administrator</td>
<td>20.0% (6)</td>
<td>63.3% (19)</td>
<td>13.3% (4)</td>
<td>0.0% (0)</td>
<td>3.3% (1)</td>
</tr>
<tr>
<td>Moderators</td>
<td>13.3% (4)</td>
<td>50.0% (15)</td>
<td>36.7% (11)</td>
<td>0.0% (0)</td>
<td>0.0% (0)</td>
</tr>
</tbody>
</table>

The layout of the DCC interfaces was approved by most users, and there was user satisfaction regarding the application. One user posted the following comment: ‘I found the system very interesting and useful. I assessed the layout and user-friendliness as just ‘good’ because I believe that it can improve and evolve. With time, I imagine a very complex website, full of voting and topics being discussed. For instance, I think this tool could be used in schools - the results would be interesting’ (sic).

The administrator’s participation was considered very good by 63.3% of the users and so was the moderators’ by 50% of the users. The moderators’ participation in the DCC is analyzed in [12].

Most users approved DCC usability. See the DCC usability evaluation below.
Finally, when asked ‘Does a virtual community make it easier to discuss and vote in group?’, 96.7% of the users answered ‘yes’. Such evaluation leads to the conclusion that the strategy adopted for deliberation in a VC is satisfactory.

6. CONCLUSIONS
Considering the Government-Citizen Interactive Model, the Democratic Citizenship Community (DCC) – a governmental virtual community – was developed and tested. In relation to them, some considerations are discussed.

The proposed model is innovative if compared to many governments’ current initiatives to promote citizens’ participation via web. Its application requires the interested governmental organs commitment, once there is no point in having new mechanisms in institutions with outdated organization cultures. Besides, the model must be adapted to the institutional purposes, considering, for example, the type of intended participation model.

Of its own accord, the presented model does not warrant the quality of the interaction between government and citizen. The interface designer can increase this quality if he or she considers important aspects of computer-mediated communication, such as usability and members’ sociability, among others. Moreover, it is essential to consider the need for bases in other social theories, encompassing the possibility of empowerment ascribed to systems, everyone’s right to accessing information (transparency) and limitations imposed by digital literacy. Thus, it is necessary to discuss criteria, defining evaluation parameters and tools that can guide the designer when developing applications in specific areas.

The experiments permitted to check the proposed model, but it is evident that, when creating a fictitious community, not managed by the government now, some issues simply do not apply. Other serious challenges are posed in the search for e-democracy, since the use of such system by millions of citizens (e.g. in a national discussion) highly increases the complexity of the model; it can be misused by influential groups or by activist politicians; the existence of ill-intentioned hackers and lurkers; and credibility should be ensured regarding the relevant information and voting.

The analysis of the use of the DCC, in the end of the experiment, allowed us to discuss and, especially, propose improvements in the communication and interaction resources employed. In this way, important points were identified for improving the DCC, which represent lessons learned [8] and desirable practices when building collaborative e-democratic environments.

It is also believed that the proposed environment is adaptable to distinct media and digital devices. Above all, digital TV and mobile phones are seen as two strong environments for research and adaptation.

As future works, we aim to investigate how the DCC will work after the insertion of other elements of the Social Web, such as presence, reputation and recommendation. Research studies on ongoing VC’s also add value by considering issues such as methods to inspect usability, accessibility and sociability; the moderator’s role; and the explanations of the power of this in the decision-making. The issues trust and security in e-Democracy, data-protection and privacy are essential to e-Government applications and deserve to be investigated afterwards.

Considering that in the evolution of the Web, there is now the Web 3.0, which deals with semantic web issues we intend to carry out researches on natural language processing in discussion forums and on ontology and semantic web usage in the DCC.

Finally, it should be noted that the DCC is used as the test application of the Maturity in Decision-Making method (MDM) [6], used for measuring, from a set of indicators, the participation of individuals in deliberative groups.

The conception of the DCC for citizens’ interaction with governmental issues allows us to verify the effectiveness and continuation of a consultative and deliberative process in the Web, using the MDM method, which allows us to assess citizens’ behavior in the decision-making process. We believe that the transferability to other countries, with different cultural backgrounds, deserves further discussions.

7. ACKNOWLEDGMENTS
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8. REFERENCES


