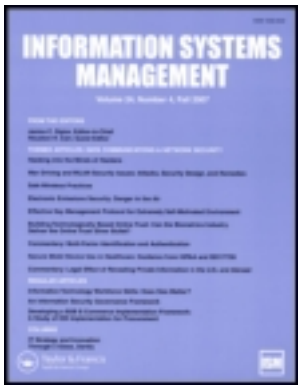

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A Multi-Method Evaluation of Different Models of Structured Electronic Consultation on Government Policies

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This article describes and evaluates two different models of structured electronic consultation, using multiple evaluation methods: discussion tree analysis, quantitative evaluation, and qualitative evaluation. The results indicate that structuring the electronic consultations leads to higher-quality focused debates, however, it can create participation difficulties and barriers to less-sophisticated and educated citizens, so it might result in reduced participation and exclusion of some groups. This can increase the "quality," but at the same time decrease the "quantity" of e-participation.

Keywords electronic participation (e-participation); electronic consultation (e-consultation); electronic forum (e-forum); issue-based information systems (IBIS)

INTRODUCTION

The need for combining representative democracy (in which representatives of citizens are making the main government decisions) with continuous citizens' participation (so that citizens not only participate in the elections, but also provide opinions, knowledge, and proposals on government's policies and plans throughout its term of office) lead to the development of public participation ideas and their wide application (Organisation for Economic Co-operation & Development [OECD], 2001; Rowe & Frewer, 2004). This combination can result in better and more transparent and acceptable government decisions. The increasing complexity of the problems and needs of modern societies makes this citizens' participation even more important, as government agencies cannot have all the required knowledge on the social problems and needs, their particular characteristics and details, possible actions for addressing them, and so forth, so the collection and exploitation of citizens' relevant knowledge is quite useful and valuable.

The increasing penetration of information and communication technologies (ICT), and especially the internet, enables the wider application of these public participation ideas and the involvement of more citizens in debates on government policies and plans, at a low cost. Many countries have made considerable investments for exploiting this potential and developing new internet-based channels of communication with citizens and society (OECD, 2003). Different ICT tools have been developed and deployed for this purpose, with some of them aiming to provide government-related information to citizens and some others aiming to support various types of two-way interactions between government and citizens, both simpler types of interactions, such as e-Surveys or e-Polls (with citizens just choosing among a number of available options), and more complex ones, such as e-consultations (with citizens entering textual postings with opinions, proposals, etc.; Macintosh, 2004; OECD, 2003; Panopoulou, Tambouris, & Tarabanis, 2010). However, the quality of these e-consultations is often below expectations (Ferro & Molinari, 2010; Hagemann, 2002; Rose & Sæbø, 2010). So there is a need for methods and ICT tools that drive electronic consultations of higher quality by facilitating the generation of better arguments and opinions.

This article investigates the use of "structured e-forum" tools (Karacapilidis, Loukis, & Dimopoulos, 2005) for this purpose, which offers the capability to organize structured electronic discussions. In the "structured e-forum," participants can enter semantically-annotated postings and associate them to previous postings according to some predefined rules based on a "discussion ontology." This is expected to result in more effective electronic discussions, with more mentally-processed, focused, and, therefore, higher-quality contributions of the participants. Such contributions are also associated with the contributions of other participants, enabling a better communication and interaction among them, in comparison with the unstructured discussions taking place in the usual unstructured forum tools.

In particular, two different models of structured electronic consultations on government plans and policies are described and evaluated. The first of them is a highly-structured consultation model based on the issue-based information systems (IBIS) framework (Conklin, 2003; Conklin & Begeman, 1989; Kunz & Rittel, 1979). Its basic discussion ontology includes five types of discussion elements: issues, alternatives, pro-arguments,

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contra-arguments, and comments. The second model of structured electronic consultations is a simpler and less-structured one, having three types of discussion elements: questions, answers, and comments. For evaluating these two models of structured electronic consultation, we designed and implemented two pilot e-consultations, on legislation under formation in the Parliaments of Austria and Greece. These pilots were performed as part of the LEX-IS project ("Enabling Participation of the Youth in the Public Debate of Legislation among Parliaments, Citizens and Businesses in the European Union") of the "eParticipation" Preparatory Action of the European Commission (Loukis, Wimmer, Charalabidis, Triantafillou, & Gatautis, 2007). They were evaluated using multiple methods: discussion tree analysis, quantitative evaluation, and qualitative evaluation. The results of the evaluation provide interesting insights into the advantages and the disadvantages of structured e-consultation and also insight into the similarities and differences between the above two models.

The article consists of six sections. In the next section, the theoretical background is described, followed in the next section by the research methodology. Then the evaluations of the two pilots are presented in two separate sections. The final section summarizes the conclusions.

THEORETICAL BACKGROUND

According to Rittel and Webber (1973), after the end of World War II, societies have tended to become increasingly heterogeneous and pluralistic in terms of culture, values, and lifestyles, and, because of this, most of the policy design problems that governments face tend to become less "tame" and more 'wicked." Tame problems are defined as ones that have clear and widely-accepted definition and objectives; this class of problems can be solved by experts using "first generation" mathematical methods, which aim to achieve some predefined objectives with the lowest-possible resources using various mathematical optimization algorithms. On the contrary, wicked problems are defined as ones that do not have clear and widely-accepted definition and objectives; usually they have many stakeholders with different and heterogeneous problem definitions, views, and concerns. This class of problems cannot be addressed by the abovementioned "first generation" approaches used for the tame problems; they require "second generation" approaches, which consist of two phases: initial consultation and argumentation among stakeholders and then mathematical analysis by experts. In particular, the first and fundamental phase of second generation approaches includes consultation among problem stakeholders, during which discourse and negotiation takes place, in order to synthesize different views and formulate a shared definition of the problem and the objectives to be achieved. Having this as a base, it is then possible in a second phase to proceed to a mathematical analysis of the well-defined problem by using mathematical optimization algorithms.

Legislation formation is definitely the most wicked class of policy design problems that governments face. The development of bills and their gradual refinement until they reach the expected quality and consensus among different stakeholders is a highly-complex process that requires extensive negotiation and synthesis (Coglianese, 1997; Loukis et al., 2007). In this process, various different stakeholders may participate, such as experts from ministries, independent experts, members of parliament, parliamentary committees, politicians, public servants, representatives of the affected socio-economic groups, non-governmental organizations, and so on. In general, each of these stakeholder groups has a different piece of information, experience, and knowledge about the problem or issue to be addressed by the legislation under formation. Hence, "synthesis" of these pieces is required. Besides that, the stakeholder groups usually have different—often conflicting—needs, values, concerns, interests, and expectations concerning the legislation under formation. It is therefore of critical importance for the quality, effectiveness, and acceptance of the legislation that these stakeholder groups to participate actively in the legislation formation process. Communication, interaction, and negotiation among the stakeholders contribute to the development of a mutual understanding of the problem, the particular objectives and finally, to the achievement of consensus to the largest possible extent. Therefore, legislation-formation process is an excellent example of a "wicked" problem that governments very often face, which needs to be "tamed" through the use of both off-line and on-line consultation.

A very useful tool for addressing wicked problems, especially for the above-mentioned consultation phase, can be the "Issue Based Information Systems" (IBIS; Kunz & Rittel, 1979). These systems enable structured electronic consultations based on a simple but powerful discussion ontology, whose main elements are "questions" (issues, problems to be addressed), "ideas" (possible answers, solutions to questions, problems), and "arguments" (evidence or viewpoints that support or object to ideas; Conklin, 2003; Conklin & Begeman, 1989; Kunz & Rittel, 1979). The use of ICT tools based on this IBIS framework allows for conducting effective structured e-consultations among the stakeholders of new government plans and policies under formation, including new legislation, thereby addressing the above inherent problems and complexities. These structured e-forum tools require the participants to make semantic annotations of their postings in an electronic discussion, according to the "discussion ontology" proposed by this framework: each participant entering a new post has to characterize/categorize it as "issue," or "alternative," or "comment," or "pro"/"contra" argument. This will guide the participants to think in a more structured way about the problem under discussion (i.e., to think which are the main problem issues, what are the solutions and main alternatives for addressing each of them, which are the main advantages and disadvantages of each alternative). Also, the participants have to associate their postings with previous ones entered by other participants,

according to the rules defined in the IBIS discussion ontology (e.g., an "alternative" can be associated only with an "issue," but not with a "pro" or a "contra" argument, while a "pro" or a "contra" argument can be associated with an "alternative," etc.). The above drive the participants to make more mentally-processed and focused contributions and also to communicate and interact better, so they are expected to increase the quality, focus, and effectiveness of the discussion. The sequences of semantically annotated and associated postings that will be produced are more convenient to be tracked and can be processed by humans and/or computers in order to draw useful conclusions from them.

However, most of the political e-consultations on public policy or legislation are conducted in unstructured e-forum environments, which allow participants to enter postings, or postings on other participants' postings, without any semantic annotation or structure. This results in lower levels of quality, focus, and effectiveness of these e-consultations, which have been mentioned and discussed in the literature (Ferro & Molinari, 2010; Hagemann, 2002; Rose & Sæbø, 2010). Also, previous relevant research has focused on the use of ICT-tools of lower structure for the above purposes, such as e-forum and e-Community tools, while limited research has been conducted on the use of more structured tools (Karacapilidis, Loukis, & Dimopoulos, 2005). For this reason, literature suggests that more research should be conducted in this direction (e.g., Rose & Sæbø, 2010).

Our study contributes to filling this research gap. It aims on one hand to investigate empirically the suitability, advantages, and disadvantages of structured e-forum tools, based on the IBIS framework as e-participation tools for supporting structured e-consultations on wicked problems related to government policies and plans. On the other hand, the value of such structured e-forum tools is empirically investigated in comparison to the less structured ones; for this purpose, a comparison of different models of structured e-consultation—differing in the discussion elements available and in the imposed degree of structure—is conducted.

RESEARCH METHODOLOGY

In order to empirically investigate the use of and compare different models of structured e-consultation on public policies among stakeholders, two pilots were conducted and evaluated. They were both focused on the above-mentioned most wicked class of policy-related problems that governments face: the formation of legislation. The first of them was conducted in the Parliament of Austria and the second in the Parliament of Greece (since both of them were participating as user partners in the LEXIS project). In particular, the empirical part of our study included the following steps:

Step I—Initiation: Analysis of the processes and main documents of the legislation formation in the Parliaments of Austria and Greece.

Step II—Pilots design: Design of pilot e-consultations on legislation under formation in the two Parliaments. For each of the pilots, the bill to be discussed, the participants, the timing of the consultation, and the informative material to be provided to the participants (including the bill to be discussed, its justification report, relevant articles in newspapers or news web sites, etc.) were identified and agreed upon. In both pilots, it was decided that the participants should be young people, since they are often pessimistic and reluctant regarding political participation, wondering what will finally happen with their voices and what will be the result (Livingstone, Bober, & Helsper, 2004), but on the contrary, they are quite familiar with ICT and use them extensively in their everyday lives.

Step III—Design and implementation of structured e-forum tools: In this step, we designed two structured e-forum tools to be used in these pilots, based on two different models of structured e-consultation. The first of them, termed as "structured e-forum I," was based on the IBIS framework, so it allowed each participant to enter five types of postings: issues, alternatives, pro arguments, contra argument, and comments. We also defined the possible associations between them according to IBIS framework: for each issue, participants were allowed to enter alternatives or comments; for each alternative, they could enter pro arguments, contra arguments, or comments; for each argument (pro or contra), other arguments (pro or contra) could be entered; and for each comment, other comments could be entered. Furthermore, we also designed a second simpler tool, termed as "structured e-forum II," based on simpler model of structured e-consultation, the Q–A (Questions–Answers) model, which has been successfully used in informative pages of many web sites. It allowed each participant to enter three types of postings: questions, answers, and comments. We also defined a number of possible associations between them: for each question, participants were allowed to enter answers or comments, and for each comment, participants were allowed to enter other comments. As stated above, this second structured e-consultation model is simpler than the first, as it allows only three types of postings instead of five allowed by the first model, and imposes less structure. These two structured e-forum tools were implemented, placing special emphasis in their ease of use and clarity (e.g., for each type of postings allowed, a different icon was used), and then tested.

Step IV—Realization: The two pilot e-consultations were conducted using the above two tools.

Step V—Evaluation:. According the literature (Loukis & Xenakis, 2008; Macintosh & Whyte, 2008), the evaluation of e-participation projects is still in its infancy, and there is no established and widely-acceptable methodology for this purpose. So, in order to formulate the evaluation methods to be used for these two pilots, we combined elements

from several e-participation evaluation methodologies and frameworks proposed in relevant literature (Bicking & Wimmer, 2008; Bicking & Wimmer, 2009; Loukis, 2012; Loukis & Xenakis, 2008; Phang & Kankanhalli, 2008; Rowe & Frewer, 2004). Based on this literature on one hand, and on the innovative characteristics of the above structured e-forum tools on the other, we decided to use multiple methods for the evaluation: discussion tree analysis, quantitative evaluation, and qualitative evaluation. This allows the formation of a more comprehensive picture of the value, advantages, and disadvantages of these tools, and also the confirmation and cross-checking of findings. In particular, the evaluation consisted of the following four stages:

1. Analysis: Analysis of the discussion trees formed by the postings of the participants in the two pilots. Analysis included the calculation of the following metrics:
   - How many postings have been entered in total, per type (e.g., issues, alternatives, etc.), and per level (at first level, second level, etc.)?
   - What percentage of the postings have been assigned a mistaken type (e.g., postings which are "alternatives" but have been characterized as "issues")?
   - What percentage of the postings are trivial (i.e., just "agree" or "disagree," without something more)?
2. Quantitative evaluation: An evaluation questionnaire was used, which included (among others) questions concerning the perceived ease of use and usefulness of the structured e-forum from the participant's viewpoint, adopting a "Technology Acceptance Model" (TAM) approach (Davis, 1989; Schepers & Wetzels, 2007; Venkatesh & Davis, 2000).
3. Qualitative Evaluation: Semi-structured focus-group discussions (Greek pilot) and interviews (Austrian pilots) with participants were used to gain a more in-depth understanding of the advantages and the disadvantages of the structured e-forum, with respect to its ease of use and usefulness.
4. Synthesis: Synthesis of the conclusions from the above three stages 1, 2, and 3, for drawing the final conclusions.

EVALUATION OF THE AUSTRIAN PILOT

The Austrian e-consultation pilot was about a draft bill titled "Child and Youth Welfare Law" (Bundes-Kinder- und Jugendhilfegesetz 2009). The main objective of the pilot was (a) to discuss the draft bill with young people, who are the main stakeholders affected by this bill, (b) to identify positive and negative aspects of the draft bill, and (c) to make proposals for improvements of it. In order to reach young people, the Austrian Parliament implemented this pilot in cooperation with eight schools. Young students were asked to discuss in the course of specific classes the draft ministerial bill, both offline and online using the abovementioned structured e-forum tools. Overall, 120 young Austrian students of age 14 to 19 years were registered in an ICT platform, which included these tools and also relevant informative material. In order to get discussion started, 10 threads on the most pertinent topics dealt with in this bill were opened by the moderators (project team and teachers); these discussions were moderated by teachers. The Austrian pilot is described in more detail by Scherer, Neuroth, Schefbeck, and Wimmer (2009).

For each discussion thread, the moderators initially tried to find the best applicable forum type. Four of these threads were created with the structure of e-forum type I (issue, alternative, pro argument, contra argument, comment), while the remaining six threads were run with the simpler structure of e-forum type II (question, answer, comment). Table 1 shows for each discussion thread the number of postings per type and in total (e.g., thread "Verwandtenpflege - §21" has 95 postings, 40 of which are pro arguments, 29 contra arguments, etc.).

We remark that the forums of type I were used more intensely than the forums of type II, with the former having on average 50.5 postings per thread and the latter only 8.5. This indicates that the more structured e-consultation model of type I e-forum provides to the participants more stimulation and guidance than the model of type II e-forum.

Also, we can see that from the 253 postings entered the 139 (55%) were comments. Foremost, in the threads "Eingriff in die privaten Lebensbereiche," "Junge Erwachsene §29," "Rechtsansprüche," and "Recht auf Erziehung §21" participants used almost only comments for expressing their opinions. This indicates that young students in many cases preferred to choose this more "broad" comment type, instead of the other more "specific" types, such as issue, alternative, pro- and contra-argument (in type I forum), or question and answer (in type II forum). Such behavior of young participants can be explained taking into account that young people are quite spontaneous and tend to write an opinion without much reflection at first hand (e.g., if it is a pro or contra statement, an alternative, an issue, an answer, or a question). Also, participants seem to be afraid of writing more "high-profile" types of postings, such as issues or alternatives in the type I e-forum (6.4% and 5.9% of postings respectively), or questions or answers in the type II e-forum (17.6% and 9.8% of postings respectively), because these types are deemed more "visible," since other participants usually pay more attention to such arguments. The above findings indicate that young participants may find structured electronic consultations too demanding. Consequently, they tend to use more the broader and less-specific types of postings, which require less mental processing and receive less attention, while avoiding the more specific and high profile types/annotations. In this way, the structured way of thinking imposed by a structured e-forum was bypassed to some extent and reduced the high-discussion structure that these structured e-forum tools attempt to provide.

Furthermore, the percentage of postings which were assigned a mistaken type was studied. Table 2 displays for

TABLE 1
Postings per type and in total for the ten discussion threads

	e-Forum type I					e-Forum type II			
Discussion thread	Issue	Alternative	Pro argument	Contra argument	Comment	Question	Answer	Comment	Total
Verwandtenpflege - §21	3	5	40	29	18	0	0	0	95
Recht auf Erziehung - §1	1	3	3	2	28	0	0	0	37
Rechtsansprueche	0	0	0	0	0	2	1	13	16
Datenverwendung - §40	0	0	0	0	0	2	2	8	12
Eingriff in die privaten lebensbereiche	2	1	0	0	49	0	0	0	52
Junge Erwachsene - §29	0	0	0	0	0	2	0	11	13
§35(2)4	0	0	0	0	0	2	2	4	8
Aufgaben der Kinder und Jugendhilfe - §3	0	0	0	0	0	1	0	1	2
Kuendigung von Pflege-verhaeltnissen - §19(6)	0	0	0	0	0	0	0	0	0
Stellungnahmen	7	3	1	0	7	0	0	0	18
Total	13	12	44	31	102	9	5	37	253
Total %	5%	5%	17%	12%	40%	4%	2%	15%	100%

TABLE 2
Percentage of postings assigned mistaken type

Discussion thread	Total postings	User postings	Postings assigned mistaken type	Postings assigned mistaken type/total entries	Postings assigned mistaken type/user entries
Verwandtenpflege - §21	95	93	21	22.1%	22.6%
Recht auf Erziehung - §1	37	36	22	59.5%	61.1%
Rechtsansprueche	16	14	5	31.3%	35.7%
Datenverwendung - §40	12	9	2	16.7%	22.2%
Eingriff in die privaten lebensbereiche	52	51	40	76.9%	78.4%
Junge Erwachsene - §29	13	11	9	69.2%	81.8%
§35(2)4	8	6	1	12.5%	16.7%
Aufgaben der Kinder und Jugendhilfe - §3	2	1	0	0.0%	0.0%
Kuendigung von Pflege-verhaeltnissen - §19(6)	0	0	0	—	—
Stellungnahmen	18	9	2	11.1%	22.2%

each discussion thread the percentage of total postings and user postings (postings entered by the students and not by the moderators) assigned a mistaken type, which in some threads was quite high. This reflects again the difficulty or unwillingness of young people to structure their opinions to the extent required by these demanding tools. In particular, most of these mistakes are in fact affiliated with the use of the type "comment" instead of "pro argument," or "contra argument," (65 cases) or "alternative" (7 cases) in type I e-forum, or instead of "answer" (16 cases) in type II e-forum.

A comparison between the two e-consultation models shows that, in structured e-forum I threads, 46.1% of postings on average were assigned a mistaken type, while in the structured e-forum II threads, 31.8 % of the postings were assigned a mistaken type. This shows again that the more structured e-consultation model of type I e-forum creates more difficulties

TABLE 3
Number of postings per level indicating the depth of discussions

Discussion Thread	Lev1	Lev2	Lev3	Lev4	Lev5	Lev6	Lev7	Lev8
Verwandtenpflege - §21	3	13	25	14	17	13	7	3
Recht auf Erziehung - §1	1	7	14	12	3	0	0	0
Rechtsansprueche	2	3	4	5	1	1	0	0
Datenverwendung - §40	2	4	5	1	0	0	0	0
Eingriff in die privaten lebensbereiche	1	4	14	22	8	3	0	0
Junge Erwachsene - §29	2	9	2	0	0	0	0	0
§35(2)4	2	3	1	1	1	0	0	0
Aufgaben der Kinder und Jugendhilfe - §3	1	1	0	0	0	0	0	0
Kuendigung von Pflege- verhaeltnissen - §19(6)	0	0	0	0	0	0	0	0
Stellungnahmen	7	9	2	0	0	0	0	0

for these young participants to semantically annotate their postings than the simpler model of type II e-forum.

Finally, the depths of the 10 discussion threads were examined and compared. In general, an e-Discussion with higher depth means higher interaction among the participants. Table 3 displays for all threads the number of postings per level of the corresponding discussion tree.

We remark that the discussions in the type I e-forum threads reached a higher depth than in the type II ones: the average depth for the former was 5.5 levels, while the latter achieved an average of 4 levels. Table 3 indicates the threads with the highest discussion depth were the first (there were postings down to level 8), the second (up to level 5) and the fifth (up to level 6), which were all of type I. This allows the conclusion that the more structured e-consultation model of type I e-forum, enabling more types of postings and associations among participants, facilitates discussions of more depth with a higher degree of interaction among the participants. On the contrary, the simpler-structured e-consultation model of type II forum results in less depth of discussion. Especially the capability of responding to previous pro and contra arguments with new pro and contra arguments seems to facilitate highly interactive discussions among the participants, though it may result in some cases in simplistic postings, which just repeat opinions of previous postings or contain more or less only "I agree" or "I disagree." For instance, in the first thread "Verwandtenpflege §21," about 25 postings repeated just the same opinion or simply stated "agree" or "disagree" to the previous postings.

In Table 4 are shown the results of the quantitative evaluation of the structured e-forum in the Austrian pilot.

Most of the respondents found the use of the structured e-forum "medium to easy" (54%) or "medium to difficult" (22%; question 1). This indicates that, to some extent, the young

TABLE 4
Results of the quantitative evaluation of the Austrian pilot

Values for questions 1 and 2:	Difficult	Medium to difficult	Medium to easy	Easy
How easy was it to use the structured e-forum?	11%	22%	54%	13%
How easy was it to access, read, and understand the postings of the other participants and the connections among them in the structured e-Forum?	6%	27%	54%	13%

Value for question 3:	Much worse	Slightly worse	Slightly better	Much better
What is your general assessment of the structured forum as a tool for important e-Consultations in comparison to the normal e-Forum tools?	8%	27%	54%	11%

participants perceived a difficulty in using the structured e-forum and semantically annotating their postings (only 13% found it "easy"). Most of the respondents found accessing, reading, and understanding the postings of the other participants and the connections among them in the structured e-forum "medium to easy" (54%) or "medium to difficult" (27%; question 2). However, despite these difficulties, most of the respondents (54%) found that the structured e-forum is a "slightly better" tool for important e-consultations, in comparison to the normal e-forum tools (question 3).

A qualitative interview conducted with young students who participated in this pilot revealed a general agreement that assigning the correct type in each new posting was not easy, and for this reason the "comment" type was mostly used as an "easy solution." Another issue raised was that readability decreases as the depth of a discussion thread increases. A student summarized these reflections as follows: "Most time we assigned the entry type comment, because that was available everywhere. Otherwise we tried to find an entry type by testing. In general the usage of the structured forum was good but sometimes for me it was hard to follow a discussion through threads with a higher depth."

Generally, the young students reckoned that the structured e-forum provides significant advantages by allowing the "assignment of meaning" in each posting. For instance, one young student noted: "In my opinion an advantage was the better overview about participant's meanings, which were symbolized with the icons in front of each posting." However, they all agreed that the use of structured e-forums requires certain structuring capabilities and knowledge as well as experience in using these tools.

EVALUATION OF THE GREEK PILOT

The Greek e-consultation pilot involved an electronic discussion about a bill concerning the 'Contracts of Voluntary Co-habitation," which regulates the matter of the formal voluntary co-habitation of two persons of different gender without being married; this is a highly controversial topic for the Greek society. This e-consultation, which was organized in cooperation with the Greek Parliament, had 79 participants; most of them were undergraduate or postgraduate students from the National Technical University of Athens and the University of the Aegean, aged mainly between 18 and 26 years (i.e., older than the participants of the Austrian pilot). The Greek Parliament provided to the participants the draft bill as well as supportive materials. As the participants in the Greek e-consultation pilot were mostly from higher educational levels, only one structured e-forum of the most complex type I (issues-alternatives-arguments-comments) was set up. The moderators initiated discussion by entering only three important issues.

In total, 79 users were registered, who contributed 131 postings on this highly-debated bill. Figure 1 gives a view of a part

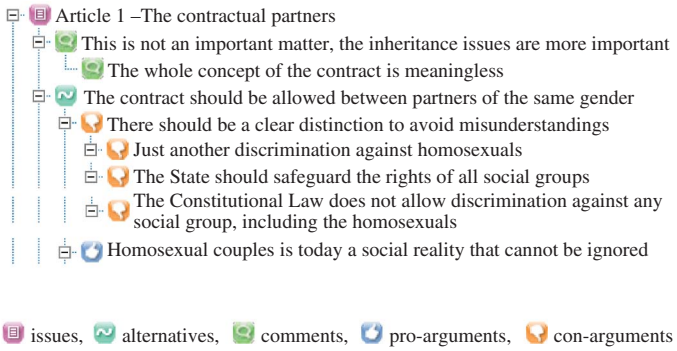

FIG. 1. Greek forum overview (color figure available online).

of the discussion tree of this Greek pilot e-consultation (translated into English). The calculation of the numbers of postings per type revealed 8 "issues," 15 suggested "alternatives," 13 "comments," 35 "pro-arguments," and 60 "con-arguments." In this pilot, we did not have the excessive use of the comment type we had in the Austrian pilot. On the contrary, a good and "balanced" discussion tree was formed, with the expected structure: several new issues (8) entered by the participants on the root topic (the bill on the "Contracts of Voluntary Co-habitation"), a higher number of alternatives (suggestions for improvements; 15)—and also a similar number of comments (13) on these issues—and a much higher number of pro-arguments (35) and con-arguments (60).

The number of postings with mistaken type was 13, which is 10% of the total number of postings. The number of simplistic postings (i.e., postings not adding any value/new information) was 8, which is 6% of the total number of postings. The depth that this electronic discussion reached was 7 levels; 8 postings were made on first level, 24 on second level, 38 on third level, 27 on fourth level, 20 on fifth level, 13 on sixth level, and one posting was made on seventh level. Therefore, the electronic discussion of the Greek pilot was characterized by considerable depth and interaction among the participants.

The results of the Greek pilot indicate that more sophisticated users (due to their university-level education) can better utilize the "discussion structure" that such a tool provides (i.e., use correctly and efficiently all the types of postings it allows); there was extensive use not only of the broader posting types (such as the comment), but also of the more specific types (such as issue, alternative, pro, and contra argument). Since the structured type I e-forum requires a considerable mental effort in order to think in the structured way such a tool imposes (i.e., to think before formulating the posting about which are the main issues, what are the main alternatives for addressing each of them, which are the main advantages and disadvantages of each alternative, etc.) and to correctly annotate postings, users who are already well trained in structured argumentation and formulation of arguments are more capable and skilled to use it. Sophisticated users are also expected to better exploit the

full potential of the more complex e-consultation models for structuring discussion.

The results of the quantitative evaluation of structured e-forum by the participants in the Greek pilot are shown in Table 5. Most of the respondents found the use of the structured e-forum "medium to easy" (68%) or "medium to difficult" (20%), while a smaller number found it "easy" (12%); nobody found it "difficult." As can be seen, even the older participants with higher education in this pilot perceived some level of difficulty in using the structured e-forum. The comparison with the Austrian case indicates that the perception of difficulties in the Greek pilot is to a lower extent than in the Austrian Pilot with the younger students (cf. Tables 4 and 5). This is also reflected in the lower percentage of postings assigned a mistaken type and the lower usage of the broad comment type. Similar conclusions can be drawn from the responses in the second question: most of the respondents found accessing, reading, and understanding the postings of the other participants and the connections among them in the structured e-forum 'medium to easy" (56%) or "medium to difficult" (27%), while a smaller number found it "easy" (12%) or "difficult" (4%). Again, the difficulty perceived by these more-sophisticated participants is slightly lower in comparison with the younger students in the Austrian pilot. Finally, most of the respondents (64%) assessed the structured forum as a "much better" tool for important e-consultations in comparison to the normal forum tools. A comparison with the Austrian pilot shows that the higher-education participants of the Greek pilot perceived a higher usefulness of the e-structured forum tool for conducting important consultations, since they can better exploit the potential of this tool for structuring discussion.

The qualitative discussion in the focus group of students of the National Technical University of Athens and the University of the Aegean revealed that the use of the structured e-forum in this pilot was considered an advantage, since it enables a more focused and effective electronic discussion. It was also mentioned that the semantic annotation of postings allowed users to quickly form an opinion as to the progress of the discussion on a specific key issue (i.e., identify quickly the main alternatives proposed and also the pro and contra arguments on them). The main difficulties referred during this interview had more to do with the design of the particular e-forum tool rather than the concept of the structured e-consultation itself; for example, it was mentioned that the platform should provide more space (i.e., a bigger box) for the structured e-forum, which should be only a few "clicks" (levels) away from the homepage of the platform, so that the user can reach it easily and quickly. The difficulty of correctly annotating new postings was mentioned as well, but to a lower extent than in the Austrian pilot. Another difficulty was the appropriate wording of the title of each posting, which is directly shown in the discussion tree of the structured e-forum (while the full description of the posting is shown in another box by clicking its title in the tree), so that it reflects the content of the posting. In fact, by observing the discussion tree, we identified several postings in which the title was not representative of the explanation of the full argument presented in the separate description box provided. Hence, it was not easy for the other participants to understand the content of the posting from its title. Another problem mentioned was associated with the moderation of the postings: from the time a posting was entered by a user, it usually took 5–6 hours until the moderator approved it and the posting became visible, so it was not possible for this user to see it immediately and possibly enter additional postings associated with it (e.g., after posting an alternative to add positive arguments for supporting it), while the other users could only see it after such a long delay, with negative consequences for the progress of the discussion.

TABLE 5
Results of the quantitative evaluation of the Greek pilot e-Consultation

Values for questions 1 and 2:	Difficult	Medium to difficult	Medium to easy	Easy
How easy was it to use the structured e-Forum?	0%	20%	68%	12%
How easy was it to access, read and understand the postings of the other participants and the connections among them in the structured e-Forum?	4%	28%	56%	12%
Value for question 3:	**Much worse**	**Slightly worse**	**Slightly better**	**Much better**
What is your general assessment of the structured forum as a tool for important e-Consultations in comparison to the normal e-Forum tools?	0%	8%	28%	64%

CONCLUSIONS

The improvement of the quality of the e-consultations conducted in many countries through the internet on government plans and policies under formulation will be very beneficial for governments (providing them useful insights and opinions) and for the whole society (improving the whole political debate). There is a need for methods and ICT tools that drive electronic consultations of higher quality by facilitating the generation of better arguments and opinions. In this direction in the previous sections two different models of structured electronic consultation have been described and evaluated. The first of them is a highly-structured e-consultation model based on the IBIS framework (having five basic discussion elements: issues, alternatives, pro-arguments, contra-arguments, and comments), while the second is a simpler and less structured e-consultation model (having three basic discussion elements: questions, answers, and comments).

It has been concluded that the structured e-consultation offers significant advantages over the usual unstructured e-consultation, as it can drive and facilitate higher quality and more focused and effective debates. This is due to the guidance it provides to the participants to think in a more-structured way about the problem under discussion: the structured e-forum I guides them to think about and clarify which are the main issues of the problem, what are the solutions and main alternatives for addressing each of them, which are the main advantages and disadvantages of each alternative, and so on; similarly, the structured e-forum II guides the participants to think and clarify which are the main questions concerning the problem under discussion, which are the answers to each question, and so on. It has been found that more-sophisticated participants (e.g., in terms of education and general thinking-ability) seem to perceive a higher usefulness of the e-Structured consultation than the less-sophisticated ones, since the former can much better use the complex discussion languages and exploit to a larger extent the potential of these tools for structuring discussion. However, even the less-sophisticated participants find the structured e-consultation highly advantageous over the unstructured one.

At the same time, it has been concluded that, for less-sophisticated participants (e.g., with lower education and general thinking-ability), the structured e-consultation can be quite difficult; this is mainly due to the big mental effort it requires, on one hand for thinking in the highly-structured way that such tools impose, annotating correctly the postings, and, in general, using efficiently their discussion languages, and on the other hand, for understanding the structured postings of the other participants and the connections among them. For this reason, they tend to reduce the structure of the discussion by using too often the more broad and low-profile types of postings (such as the "comment"), instead of the more specific and high-profile ones (such as the "issue," the "alternative," and the "pro/contra argument"). Also, they tend to make many mistakes in postings' annotations, which has negative impact on the quality of the debate. In general, less-sophisticated participants tend to make lower and suboptimal exploitation of the potential of the structured e-forum tools for structuring discussions, and this results in less-structured e-consultations. On the contrary, more sophisticated users (such as the undergraduate and postgraduate students who participated in the Greek pilot) seem to be able to utilize correctly and efficiently the "discussion language" provided even by a complex e-consultation model, though they recognize as well that this requires a considerable mental effort. We saw that such sophisticated users are capable of utilizing efficiently all the "expressiveness" of such a language (even a rather rich and complex one, such as the one of the IBIS-based e-consultation model), making effective use of all the types of postings provided.

A comparison between the two examined e-consultation models revealed that the first, more-structured e-consultation model results in more extensive discussions with more postings and depth and in higher interaction among the participants, in comparison with the second simpler and less-structured model. This can be attributed to the stronger stimulation and guidance and also to the richer discussion language provided by the first model in comparison with the second.

This empirical study has interesting implications for research and practice. It opens up a new research stream aiming to develop and investigate new ways of structuring e-consultations on government policies and plans and, in general, new models of structured e-consultation, and provides a research framework and methodology for this; these new ways and models can differ in the level of structure and the richness of discussion language and also in the targeted groups of citizens. This research should systematically investigate the multiple dimensions of the value generated by new models of structured e-consultation, their advantages and disadvantages, the dependence of them on the technological and functional characteristics of the ICT tools made available to the citizens, and on the context (e.g., characteristics of the users and the discussed topic). With respect to practice, our research indicates that structured e-consultation can be for government agencies a very important and useful mechanism for high-quality interaction with the society, allowing them to collect valuable knowledge, insights, and opinions from citizens. However, though our results indicate that structuring the electronic consultations leads to debates of higher focus and quality, it can create participation difficulties and barriers to less-sophisticated and educated citizens; therefore it can increase the "quality," but at the same time decrease the "quantity" of e-participation. Structured e-consultation should not be considered as a better substitute for the unstructured e-consultation (that many government agencies have already adopted, through simple unstructured e-forum tools in their web sites), since this would reduce the number of citizens participating in e-consultations and possibly exclude some social groups, but as a complement of it. Government agencies can organize e-consultations with a wider public in simple e-forums, while at the same time, they can use various structured e-forum

tools (with different levels of structure and discussion language richness) to consult with various more sophisticated or expert groups. In general, government agencies have to define the appropriate mix of e-consultation mechanisms (including in it also the Web 2.0 social media, which are already being used by government agencies for interacting with larger numbers of citizens [e.g., Nam, 2012]), based, on one hand, on the characteristics of the public they want to involve in policy debate (from educational, cultural, age, sex, income, computer literacy, and use viewpoints), and based, on the other hand, on the complexity of the topics to be discussed. Further research is required for evaluating the above models of structured e-consultation for other classes of public policy design problems (beyond legislation formation) in various contexts. Also, further research is required in this area, as mentioned above, for developing new models of structured e-consultation among government agencies and citizens and innovative ICT tools for this purpose, and also evaluating them extensively in different contexts through "real-life" pilots, so that we can reach a higher maturity of structured e-consultation.

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REFERENCES

Bicking, M., & Wimmer, M. (2008). *Deliverable 2.5: E-Participation Projects Evaluation Methodology*. MOMENTUM Project Deliverable.

Bicking, M., & Wimmer, M. (2009). Evaluation framework to assess eParticipation projects in Europe. *Proceedings of Ongoing Research, General Development Issues and Projects of ePart 2009—1st International Conference*, Linz, Austria, September 1–3.

Coglianese, C. (1997). Assessing consensus: The promise and performance of negotiated rulemaking. *Duke Law Journal*, *46*(6), 1255–1349.

Conklin, J. (2003). Dialog mapping: Reflections on an industrial strength case study. In P. Kirschner, S. Buckingham Shum, & C. Carr (Eds.), *Visualizing argumentation: Software tools for collaborative and educational sense-making*, London: Springer Verlag.

Conklin, J., & Begeman, M. (1989). gIBIS: A tool for all reasons. *Journal of the American Society for Information Science*, *40*(3), 200–213.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use and user acceptance of information technology. *MIS Quarterly*, *13*(3), 319–340.

Ferro, E., & Molinari, F. (2010). Making sense of Gov 2.0 strategies: "No citizens, no party". *eJournal of eDemocracy and Open Government*, *2*(1).

Frewer, L. J., & Rowe, G. (2005). Evaluating public participation exercises: Strategic and practical issues. *Evaluating Public Participation in Policy Making* pp. 85–108. Paris, France: OECD Publication Service.

Hagemann, C. (2002). Participation in and contents of two Dutch political party discussion lists on the internet. *Javnost – The Public*, 9(2), 61–76.

Karacapilidis, N., Loukis, E., & Dimopoulos, S. (2005). Computer-supported G2G collaboration for public policy and decision making. *Journal of Enterprise Information Management*, *18*(5), 602–624.

Kunz, W., & Rittel, H. W. J. (1979). *Issues as elements of information systems: Working paper No. 131*. Heidelberg, Germany: Studiengruppe für Systemforschung.

Livingstone, S., Bober, M., & Helsper, E. (2004). *Active participation or just more information?: Young people's take-up of opportunities to act and interact on the Internet*. London: LSE Research Online. Retrieved from http://eprints.lse.ac.uk

Loukis, E. (2012). Evaluating e-participation projects and lessons learnt. In Y. Charalabidis, S. Koussouris, (Eds.), *Empowering open and collaborative governance: Technologies and methods for electronic citizen participation in public policy making*. Berlin, Heidelberg: Springer Verlag.

Loukis, E., Wimmer, M., Charalabidis, Y., Triantafillou, A., & Gatautis, R. (2007). Argumentation systems and ontologies for enhancing public participation in the legislation process. *Proceedings of EGOV 2007 International Conference*, Regensburg, Germany, September 3–7.

Loukis, E., & Xenakis, A. (2008). A framework for evaluating eParticipation in the legislation development process. In E. Ferro, H. J. Scholl, M. A. Wimmer (Eds.), *Proceedings of ongoing research and projects of Electronic Government (EGOV 08)*, Turin, Italy, August 31–September 5.

Macintosh, A. (2004). Characterizing e-participation in policy-making. *Proceedings of the 37th Hawaii International Conference on System Sciences (HICSS-37)*, Big Island of Hawaii, January 5–8.

Macintosh, A., & Whyte, A. (2008). Towards an evaluation framework for eParticipation. *Transforming Government: People, Process & Policy*, *2*(1), 16–30.

Nam, T. (2012). Suggesting frameworks of citizen-sourcing via Government 2.0. *Government Information Quarterly*, *29*, 12–20.

Organisation for Economic Co-operation & Development (OECD). (2001). *Citizens as partners: Information, consultation and public participation in policy-making*. Paris, France: OECD Publication Service.

Organisation for Economic Co-operation & Development (OECD). (2003). *Promise and problems of e-Democracy: Challenges of online citizen engagement*. Paris, France: OECD Publication Service.

Panopoulou, E., Tambouris, E., Tarabanis, K. (2010). eParticipation initiatives in Europe: Learning from practitioners. *Proceedings of Electronic Participation – ePart 2010*, 54–65. Lausanne, Switzerland, August 29–September 2.

Phang, C. W., & Kankanhalli, A. (2008). A framework of ICT exploitation for e-participation initiatives. *Communications of the ACM*, *51*(12), 128–132.

Rittel, H. W. J., & Webber, M. M. (1973). Dilemmas in a general theory of planning. *Policy Sciences*, *4*, 155–169.

Rowe, G., & Frewer, L. J. (2004). Evaluating Public-Participation Exercises: A research agenda. *Science, Technology, & Human Values*, *29*(4), 512–57.

Rose, J., & Sæbø, Ø. (2010). Designing Deliberation Systems. *The Information Society*, *26*, 228–240.

Schepers, J., & Wetzels, M. (2007). A meta-analysis of the technology acceptance model: Investigating subjective norm and moderation effects. *Information & Management*, *44*, 90–103.

Scherer, S., Neuroth, C., Schefbeck, G., & Wimmer, M. A. (2009). Enabling eParticipation of the youth in the public debate on legislation in Austria: A critical reflection. In A. Macintosh, & E. Tambouris (Eds.), *Proceedings of the ePart Conference 2009*, 151–162. Linz, Austria, September 1–3, 2009.

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*, *46*(2), 186–204.