Using advanced information technologies for increasing public participation in the Greek Parliament

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Introduction

Parliaments are institutions of vital importance for modern democracies with highly important responsibilities: making laws, communicating with and representing citizens and overseeing the executive. The rapid growth and penetration of information and communication technologies (ICTs) has changed considerably the environment in which parliaments operate: citizens (and especially the youth), firms and government agencies are increasingly using ICT both for doing their internal work more efficiently and for communicating with others. Responding to this trend, in combination with the highly information-intensive nature of their responsibilities and tasks, parliaments have started using ICTs for supporting both their internal operations (e.g. for managing their numerous legislative documents, for financial accounting, etc.) and their communication with citizens and groups interested in the legislation under formation and discussion. According to the *World e-Parliament Report 2010*[1] of the 'Global Centre for ICT in Parliament' (a partnership initiative of the United Nations[2] and the Inter-Parliamentary Union)[3] there is a growing use of ICTs by parliaments all over the world driven by their fundamental values and objectives: representativeness, transparency, accessibility, accountability and effectiveness.[4] In particular, the study presented in the above report, which has been based on a survey of 134 parliaments from all over the world, concludes that there is wide use of 'basic' ICT tools by them. For instance, almost all the surveyed parliaments have a website (for promoting transparency and accountability), 96 per cent have a local area network (LAN) (for increasing effectiveness), 80 per cent provide Members of Parliament (MPs) with either desktop or laptop computers (also for increasing effectiveness), while 78 per cent reported that most or some MPs use e-mail in order to communicate with citizens (for promoting accessibility, interaction with society and representativeness). However, the same study also concludes that there is much lower use of more advanced ICT with high potential to be very useful to parliaments for achieving their objectives and promoting their values. For instance, less than half of the

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[1] *World e-Parliament Report 2010*, Global Centre for ICT in Parliament, United Nations and Inter-Parliamentary Union, 2010, available at: <www.ictparliament.org>.

[2] <www.un.org>.

[3] <www.ictparliament.org>.

[4] *Parliament and Democracy in the Twenty-First Century: A Guide to Good Practice*, Inter-Parliamentary Union, Geneva, 2006.

surveyed parliaments have systems supporting the management of proposed legislation documents all over their life cycle (which would considerably increase internal effectiveness and transparency), only 25 per cent use the XML standard for parliamentary documents (which would improve processing and dissemination capabilities, promoting effectiveness, accessibility and transparency), while much less, only 16 per cent, organize e-consultations on bills (which would considerably enhance accessibility, interaction with society and representativeness).

It is therefore of critical importance for parliaments to go beyond the basic ICT, and select, assess and use appropriate more advanced ICT in order to achieve to a higher extent their above-mentioned objectives. Due to the information-intensive nature of their tasks this is going to allow them to maintain or even enhance their important role in the modern national governance systems, and contribute substantially to the management of the big, multi-dimensional and complex problems that modern societies face. In this direction this paper describes and evaluates a first attempt of the Greek Parliament to use two advanced ICTs, arguments visualization and structured e-forum (presented later in the third section), for increasing the quantity and quality of public participation in the legislation formation process. Both these technologies have a common theoretical foundation (the theoretical work on the 'wicked problems' and the use of 'Issue Based Information Systems' (IBIS) for supporting argumentative approaches for solving them, outlined in the following section) and aim to structure electronic information provision to citizens and consultation with them, respectively, and in this way improve them substantially. Taking into account that public participation in the legislation formation in order to be meaningful and effective necessitates citizens to be sufficiently informed on complex issues, usually analysed in lengthy parliamentary documents in a legal and technical language, the use of arguments visualization aims to provide this information to citizens in an easily understandable and structured schematic manner, promoting transparency and accountability. Furthermore, discussions (both traditional, in 'face-to-face' mode, or electronic) on legislation under formation between heterogeneous participants with different viewpoints, perspectives, concerns and interests, in order to be effective and productive, need to be focused, structured and based on the exchange of arguments and contra-arguments; the use of structured e-forum (instead of the usual simple unstructured e-forum) aims to structure the electronic consultations on legislation under formation among stakeholders (i.e. among all affecting or affected by this legislation) and make it more substantial and argumentative, promoting interaction with society, accessibility and representativeness. The research presented in this paper has been conducted 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') (www.lex-is.eu) supported by the 'eParticipation' Preparatory Action of the European Commission.[5]

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[5] E. Loukis, M. Wimmer, Y. Charalabidis, A. Triantafillou and R. Gatautis, 'Argumentation systems and ontologies for enhancing public participation in the legislation process', *EGOV 2007 International Conference*, Regensburg, Germany, 3–7 September 2007.

This paper is organized in six sections. The following section outlines our theoretical background, followed by the third section describing the technological platform we developed with the above advanced features. In the fourth section is described the evaluation methodology, and in the fifth section the evaluation results. Finally, in the sixth section the conclusions are summarized and future research directions are suggested.

Theoretical Background

Rittel and Weber in their highly influential paper discussing 'Dilemmas in a General Theory of Planning'[6] point out that the nature of public policy problems tends to change dramatically. Previously, though they were not trivial, they were 'tame', with this term denoting that they had more clear and widely accepted definitions and objectives, so they could be solved by professionals using 'first generation' methods, which resemble the ones used in natural sciences and engineering, and are based on the idea of 'efficiency'; in particular these methods focus on achieving some predefined objectives with the lowest possible resources through mathematical optimization algorithms. This approach has been successful in solving well-defined problems associated with basic needs and problems of society, for example, with building basic infrastructures and services, such as electricity and water provision, education, etc. However, as societies tend to become more heterogeneous and pluralistic in terms of culture, values, concerns and lifestyles, their public policy problems tend to become 'wicked', this term denoting that they lack clear and widely agreed definitions and objectives, and are characterized by high complexity and many stakeholders with different and heterogeneous problem views, values and concerns. The above paper identifies 10 characteristics of these wicked problems, which differentiate them from the tame ones, and necessitate a different approach to solving them:

- There is no definitive formulation of a wicked problem.
- Wicked problems have no stopping rule (like the ones of the natural sciences and engineering), so planners stop for reasons which are external to the problem, for example, running out of time or money.
- Solutions to wicked problems are not 'true-or-false', but 'good-or-bad', and this judgement is not 'objective', but highly 'subjective', depending on the group or personal interests of the judges and their special value-sets.
- There is no immediate and ultimate test of a solution to a wicked problem (this requires examination of several types of impacts on numerous persons or groups, and for a long time period).
- Every solution to a wicked problem is a 'one-shot' operation; every attempt counts significantly and there is no opportunity to learn by trial-and-error.
- Wicked problems do not have an enumerable (or an exhaustively describable) set of potential solutions, nor is there a well-described set of permissible operations that may be incorporated into the plan.
- Every wicked problem is essentially unique (despite seeming similarities among wicked problems, one can never be certain that the particulars of a

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[6] H. W. J. Rittel and M. M. Weber, 'Dilemmas in a general theory of planning', *Policy Sciences*, 4, 1973, pp. 155–169.

problem do not override its commonalities with other problems already dealt with).

- A wicked problem usually can be considered as a symptom of another 'higher level' problem, so defining the boundaries and the level at which such a problem will be addressed is of critical importance.
- The existence of a discrepancy between the real state of affairs and a desired/targeted one which constitutes a wicked problem can be explained in numerous ways, and the choice of explanation determines the nature of the problem's resolution.
- The public policy planner has no right to be wrong, as the consequences will be severe for many citizens.

For these reasons the wicked problems cannot be solved only by using mathematical algorithms that calculate 'optimal' solutions, since they lack basic pre-conditions for this: they do not have clear and widely agreed definitions (with each stakeholder usually having a different view of it) and objectives (which could be used as criteria for evaluating possible solutions). So they cannot be addressed through the above 'technocratic' first generation methods; for this reason Rittel and Weber in the above-mentioned influential paper suggest that wicked problems require a different 'second generation' approach, which combines public participation with technocratic analysis by experts. In particular, its first and fundamental phase is consultation and argumentation among problem stakeholders, during which discourse, reasoning and negotiation take place, aiming 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 technocratic analysis by experts (e.g. using mathematical optimization algorithms for the defined problem).

Further research on this participative/argumentative approach to the solution of public policy problems resulted later in the development of the 'Issue Based Information Systems' (IBIS) concept[7] as a means to support with ICT its application; such a system aims to 'stimulate a more scrutinized style of reasoning which more explicitly reveals the arguments. It should help identify the proper questions, to develop the scope of positions in response to them, and assist in generating dispute.' IBIS are based on a simple but powerful discussion model, whose main elements are 'topics' (meant as broad discussion areas), 'questions' (particular issues–problems to be addressed within the discussion topic—they can be factual, deontic, explanatory or instrumental), 'ideas' (possible answers–solutions to questions) and 'arguments' (evidence or viewpoints that support or object to ideas).

However, there are only a few previous publications describing the use of structured electronic discussion tools based on the IBIS framework for public policy consultations,[8] while quite limited is the research that has been conducted

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[7] W. Kunz and H. Rittel, 'Issues as elements of information systems', Working Paper No. 131, University of California, Berkeley, 1979; J. Conklin and M. Begeman, 'gIBIS: a tool for all reasons', *Journal of the American Society for Information Science*, 40(3), 1989, pp. 200–213; J. Conklin, 'Dialog mapping: reflections on an industrial strength case study', in P. Kirschner, S. Buckingham Shum and C. Carr (eds), *Visualizing Argumentation: Software Tools for Collaborative and Educational Sense-Making*, Springer-Verlag, London, 2003.

[8] N. Karacapilidis and D. Papadias, 'Computer supported argumentation and collaborative

concerning the systematic evaluation of such structured tools.[9] Also, some research has been conducted on the use of the IBIS framework for the visualization (schematic representation) of the main points of political dialogues, so that they can be easily understood by the public.[10] Therefore, further research is required concerning the application of this framework for structuring electronic information provision and consultation in real-life public policy problems, and its systematic evaluation.

It should be emphasized that the problems of legislation formation are highly wicked, since they are characterized by high complexity (in most laws under formation there are many interrelated issues to be regulated) and many stakeholder groups, with each of them having quite different views of the problem, values and interests, which are very often in conflict with one another. For these reasons legislation formation necessitates a high level of well-organized and wide participation of all stakeholders and efficient consultation among them. However, this is not possible due to time limitations, so most parliaments for each bill under discussion usually invite in the competent parliamentary committee only a few representatives of the most important stakeholders, give them some time to express their opinions and allow them only some limited interaction with MPs (usually they answer MPs' questions). Using appropriate ICT tools both the quantity and the quality of stakeholders' participation can be considerably increased, resulting in better, more balanced and applicable legislation.

Description of the Technical Platform

The Greek Parliament at the beginning of the LEX-IS project had already a website,[11] which provided extensive information about the legal framework of its operation and the Greek Constitution, the MPs (CVs and activities) and also all the documents of the legislation that has been passed or is under discussion (justification report, initial document, report of the first discussion in the competent parliamentary committee, amendments, final document). However, this website did not have a space for e-consultations on bills under discussion for

Footnote 8 continued

decision making: the HERMES system', *Information Systems*, 26(4), 2001, pp. 259–277; T. F. Gordon and N. Karacapilidis, 'The Zeno argumentation framework', paper presented at the Sixth International Conference on Artificial Intelligence and Law (ICAIL '97), 1997.

[9] N. Karacapilidis, E. Loukis and S. Dimopoulos, 'Computer-supported G2G collaboration for public policy and decision making', *Journal of Enterprise Information Management*, 18(5), 2005, pp. 602–624; A. Xenakis and E. Loukis, 'An investigation of the use of structured e-Forum for enhancing e-Participation in parliaments', *International Journal of Electronic Governance*, 3(2), 2010, pp. 134–147.

[10] A. Renton, 'Seeing the point of politics: exploring the use of CSAV techniques as aids to understanding the content of political debates in the Scottish Parliament', *Artificial Intelligence and Law*, 14, 2006, pp. 277–304; A. Renton and A. Macintosh, 'Computer supported argument maps as a policy memory', *Information Society Journal*, 23(2), 2007, pp. 125–133; R. Ohl, 'Computer supported argument visualisation: modelling in consultative democracy around wicked problems', in A. Okada, S. Buckingham Shum and T. Sherborne (eds), *Knowledge Cartography: Software Tools and Mapping Techniques*, Springer-Verlag, London, 2008; E. Loukis, A. Xenakis and N. Tserpeli, 'Using argument visualization to enhance e-Participation in the legislation formation process', *IFIP First International Conference on e-Participation—ePart 2009*, Linz, Austria, September 2009.

[11] < www.hellenicparliament.gr >.

promoting e-participation. So it was decided to develop, as part of the LEX-IS project, an advanced e-consultations platform for extending the public participation in the legislation formation beyond the few stakeholders' representatives invited in the competent parliamentary committee, so that more representatives, and also simple citizens as well, can participate.

The basic component of this platform is a structured e-forum based on the IBIS framework, which requires participants to annotate semantically each new posting as 'issue', 'alternative', 'pro-argument', 'contra-argument' or 'comment'. This is expected to guide the participants to think in a more structured way about the bill under discussion (i.e. to think 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.), make more mentally processed and focused contributions, and finally increase the quality, focus and effectiveness of the discussion. Additionally, this structured e-forum tool requires each posting to be associated with a previous one according to some predefined rules based on IBIS: for each issue participants are allowed to enter other issues, alternatives or comments, for each alternative they can enter pro-arguments, contra-arguments or comments, for each argument (pro or contra) other arguments (pro or contra) and for each comment other comments. This is expected to improve the interaction and communication among the participants, and therefore increase further the quality, focus and effectiveness of the discussion.

Using this structured e-forum tool a pilot electronic consultation was held on a highly controversial bill under formation regulating the 'Contracts of Voluntary Cohabitation', which formalized an existing social situation in Greece for a long time: many couples, especially among the younger age groups, are reluctant to proceed directly to marriage, and instead choose to live together under the same roof for some time, and during that time have children, share living expenses and buy property. These couples were not legally bonded, leaving the weaker partner unprotected in case that such an informal cohabitation ends. In order to cover this legal gap this bill regulates the formalization of the voluntary cohabitation of couples, and also the issues arising when such unions are dissolved. It consists of 13 main articles and their titles are shown in Appendix A. In this pilot e-consultation 79 citizens participated, aged between 18 and 35 years old, coming mainly from the university and the parliament environment. In Figure 1 we can see a part of the discussion tree that has been formed (translated in English). In total were entered 8 'issues' 🔲 , 15 'alternatives' 🔷, 13 'comments' 🟢, 35 'pro-arguments' 🔵 and 60 'con-arguments' 🔴.

This platform includes also a space providing background information to the participants in the e-consultations about the bill under discussion. In particular, the participants of this pilot were provided with the following documents:

(a)   the justification report of the bill, which is authored by the proposing competent Ministry and includes the main problems and reasons that necessitate the proposed law and the basic directions and solutions it provides;

(b)   the content of the bill, which includes a number of articles, each of them settling a particular issue;

(c)   the minutes of the discussion of this bill in the competent parliamentary committee, which includes the opinions and positions of the invited
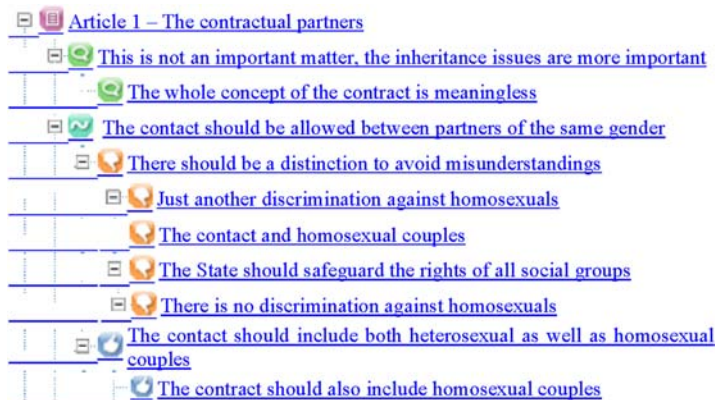
Figure 1. Part of the discussion tree formed in the structured e-forum.

stakeholders' representatives and experts, and also the ones of the parties' main speakers.

Additionally, in the same space were also provided visualizations of the main points of the above documents, which were based on the IBIS framework as well, constructed using the 'Compendium' tool.[12] Each of these visualizations had the form of a map of interconnected question nodes (issues, problems), idea nodes (solutions, settlements), argument nodes (positive ones corresponding to advantages and negative ones corresponding to disadvantages) and information nodes. These visualizations aimed to provide to the participants the information of the corresponding lengthy and difficult to understand documents in an easily understandable and structured schematic manner. In Figures 2–4 are shown the visualizations of the justification report, of one article of the bill and of the position of one political party, respectively.

Evaluation Methodology

Through a synthesis of elements from existing 'traditional' (offline) public participation evaluation frameworks[13] and e-participation evaluation frameworks,[14] and taking also into account the particular characteristics of the legislation formation process, a methodology for evaluating e-participation

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[12] <compendium.open.ac.uk/institute>.

[13] C. Coglianese, 'Assessing consensus: the promise and performance of negotiated rulemaking', *Duke Law Journal*, 46(6), 1997, pp. 1255–1349; G. Rowe and L. J. Frewer, 'Public participation methods: a framework for evaluation', *Science, Technology, & Human Values*, 25(1), 2000, pp. 3–29; G. Rowe and L. J. Frewer, 'Evaluating public-participation exercises: a research agenda', *Science, Technology, & Human Values*, 29(4), 2004, pp. 512–557; G. Rowe, R. Marsch and L. J. Frewer, 'Evaluation of a deliberative conference using validated criteria', *Science, Technology, & Human Values*, 29(1), 2004, pp. 88–121; OECD (Organization for Economic Co-operation & Development), *Evaluating Public Participation in Policy Making*, OECD Publication Service, Paris, 2004.

[14] A. Whyte and A. Macintosh, 'Analysis and evaluation of e-consultations', *e-Service Journal*, 2(1), 2003, pp. 9–34; OECD, *Promise and Problems of e-Democracy: Challenges of Online Citizen Engagement*, OECD Publication Service, Paris, 2003; A. Macintosh and A. Whyte, 'Evaluating how e-participation changes local participation', *eGovernment Workshop '06 (eGOV06)*, Brunel University, London,
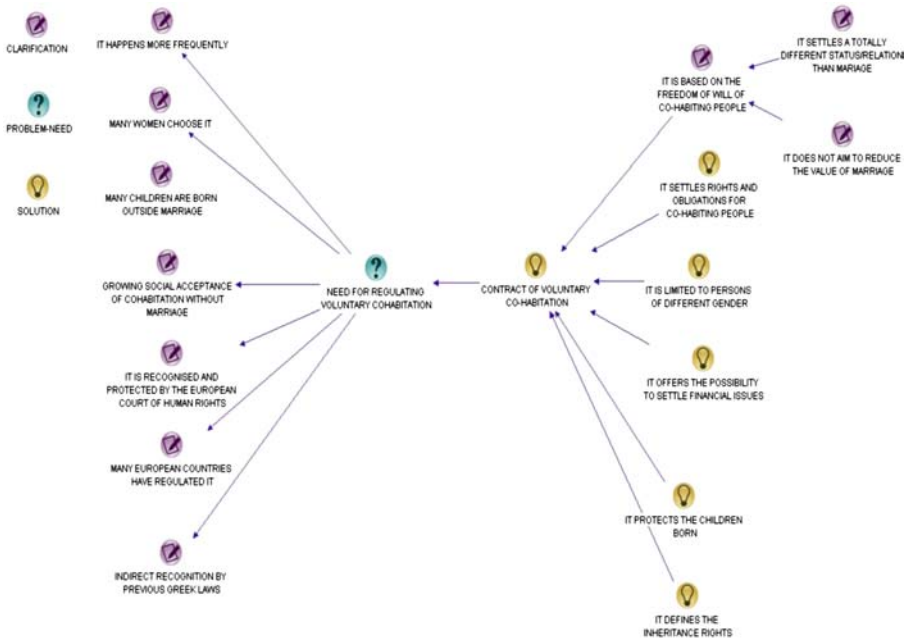
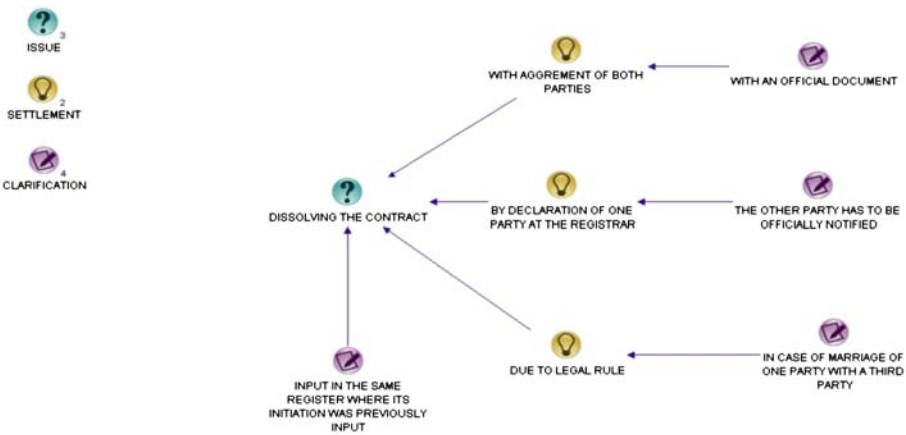**Figure 2.** Visualization of the justification report.

Figure 3. Visualization of the fourth article of the bill (concerning the dissolution of a contract).

in parliaments was developed;[15] then an adaptation of it to the LEX-IS project was made, which is organized around four evaluation perspectives:
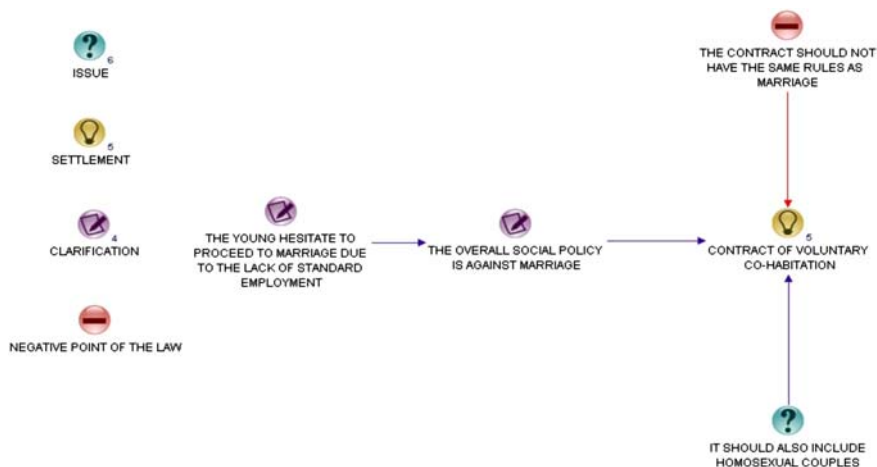
Figure 4. Visualization of the position of one political party.

i) Context (CONT) (aiming to assess important characteristics of the context in which the pilot has taken place)

ii) Process (PRO) (aiming to assess the process that has been followed in the pilot)

iii) System (SYS) (aiming to assess the technical platform)

iv) Outcomes (OUT) (aiming to assess the outcomes of this pilot from a political viewpoint).

These four perspectives were used as a basis for both quantitative (using a questionnaire) and qualitative (by a focus group of participants, officials of the Greek Parliament and MPs' assistants) evaluation. As part of the former for each perspective a number of evaluation criteria have been defined, which have been used for preparing a questionnaire for quantitative evaluation, shown in Appendix B. The 'Context' perspective includes a number of questions assessing the demographic characteristics of participants (age, gender and education) and their extent of interest in the bill under discussion. The 'Process' perspective includes a number of questions assessing the extent of having informed the participants about the purpose and objectives of this project, the participants and their role; the extent of having sufficient and appropriate rules and management in this e-consultation, and adequacy of time for getting informed on the bill and then for discussing electronically about it; and the quality of information provided to the participants about the bill, with the main emphasis on the visualizations. The 'System' perspective includes a number of questions assessing how easy it was to learn and use the platform, with the emphasis on the structured e-forum tool, and the appropriateness of the tools and technologies deployed in the platform for supporting e-participation. Finally, the 'Outcomes' perspective includes a number of questions assessing the extent of platform usage (frequency of platform usage and contributions, usage of the visualizations, etc.), the perceived quality of contributions and learning from them, the perceived impact achieved on the particular legislation, the participants' satisfaction and their intention to participate again in similar e-consultations in the future.

We remark that this evaluation methodology covers both the 'efficiency' and 'effectiveness' dimensions proposed by relevant ICT evaluation literature;[16] also it covers both the 'ease-of-use' and 'usefulness' dimensions proposed by the technology acceptance models literature.[17]

Evaluation Results

In this section we present the results of the evaluation of the above four perspectives of this pilot e-consultation, based on a synthesis of the evidence collected from both the quantitative and the qualitative parts of it.

Context

Initially we analysed the context of the pilot, which is important for interpreting the findings from the evaluation of the other three perspectives of it: this has shown that the participants were young (80 per cent of them were 21–30 years old, while the remaining 20 per cent were 31–40 years old) and highly educated (60 per cent were university graduates, while the remaining 40 per cent had postgraduate education as well), with a small overrepresentation of males (60 per cent) in comparison with females; also, a very large majority of the participants found the topic under discussion interesting and very important or important.

Process

As a next step we analysed the process of this pilot e-consultation. In general it can be concluded that there was a good organization of the pilot, resulting in a good understanding by a large majority of the participants about the objectives, the participants and their role. Most of the participants found that there was appropriate management rules in the electronic discussion and sufficient time, and also that sufficient and objective information was provided to them about the bill under discussion. With respect to clarity, most participants found that the information provided to them was clear to a very good (16 per cent) or good extent (44 per cent), but a considerable extent perceive a medium (36 per cent) or even small (4 per cent) level of clarity of these parliamentary documents (Figure 5). Taking into account the above-mentioned high educational level of the participants, this result shows the inherent difficulty that non-experts have in understanding such parliamentary documents usually written in a complex, legal and technical language (we expect that for an 'average' citizen there will be more difficulties).

This makes the visualization of the main points of these documents necessary if we want to achieve a wider dissemination and discussion of them. The majority

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[16] S. Smithson and R. Hirschheim, 'Analysing information systems evaluation: another look at an old problem', *European Journal of Information Systems*, 7, 1998, pp. 158–174.

[17] F. D. Davis, 'Perceived usefulness, perceived ease of use, and user acceptance of information technology', *MIS Quarterly*, 13(3), 1989, pp. 319–339; V. Venkatesh and F. D. Davis, 'A theoretical extension of the technology acceptance model: four longitudinal field studies', *Management Science*, 45(2), 2000, pp. 186–204; V. Venkatesh, M. G. Morris, G. B. Davis and F. D. Davis, 'User acceptance of information technology: toward a unified view', *MIS Quarterly*, 27(3), 2003, pp. 425–478.
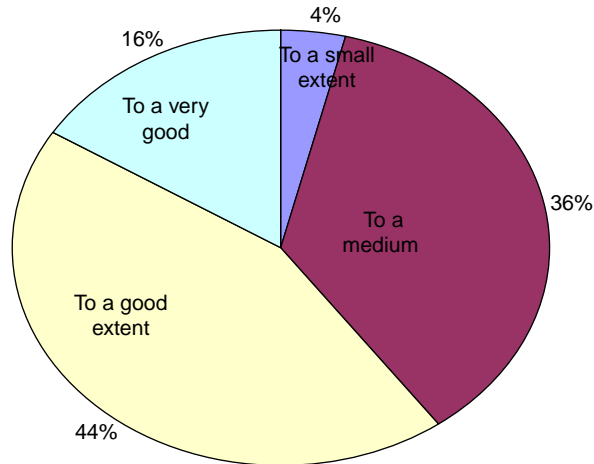
Figure 5. Perceived clarity of the information provided to the participant on the bill.

of the participants found these visualizations very easy (32 per cent) or easy (24 per cent) or rather easy (40 per cent) to understand, while nobody found them rather difficult and only a few (4 per cent) found them difficult to understand (Figure 6).

Similar are the conclusions from the more specific questions on this, which reveal that the visualizations were very helpful for understanding the justification report and the content (articles) of the bill, and also the positions/opinions of the experts invited and five political parties present in the Greek Parliament. Also, a large majority of the participants (96 per cent) found the visualizations sufficient for understanding the main points of this bill and did not have to open the corresponding textual documents.

Figure 6. Perceived ease of understanding the visualizations.

All the persons who participated in the qualitative discussion in the focus group agreed that the visualizations were understandable to them, after a learning period of familiarization with the symbols. The advantages of visualizations were proved to be the time efficiencies created for the participants who did not h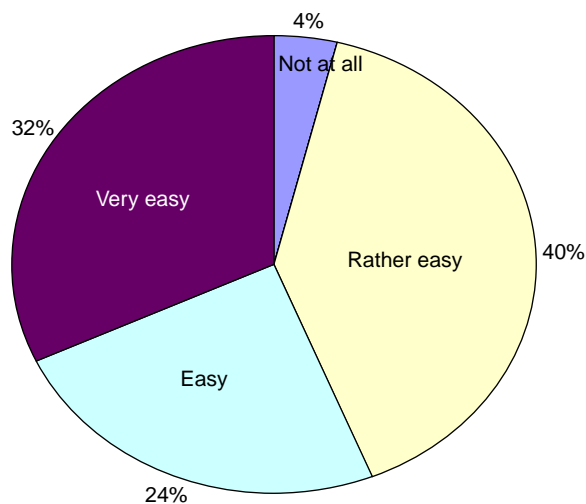ave the time to go through all the related texts provided. They also mentioned that the visualizations of the positions/opinions of the experts and the political parties were more understandable than the visualizations of the content (articles) of the law and its justification report (because the latter are in a more legal/technical language than the former). A weakness of the visualizations of the articles of the law came from the opinion of a legal expert, who argued that all the types of settlements included were represented by a single type of node ('settlement node'), though there are different kinds of legal rules, such as prohibitive, imperative, permitting and presumptions, which should be represented by different types of nodes.

System

Next we focused on the system (technical platform) that was used in this pilot e-consultation. In general, a large majority of the participants found it easy (84 per cent) or very easy (4 per cent), while quite a low percentage of the participants had a negative perception on this (12 per cent) (Figure 7).

However, if we focus on the most innovative component of it, the structured e-forum, a different picture is revealed. Only a small percentage of the participants (12 per cent) found it easy to use the structured e-forum (i.e. to correctly characterize an idea as an issue, an alternative, a pro-argument, a contra-argument or a comment, and then correctly associate it with a previous
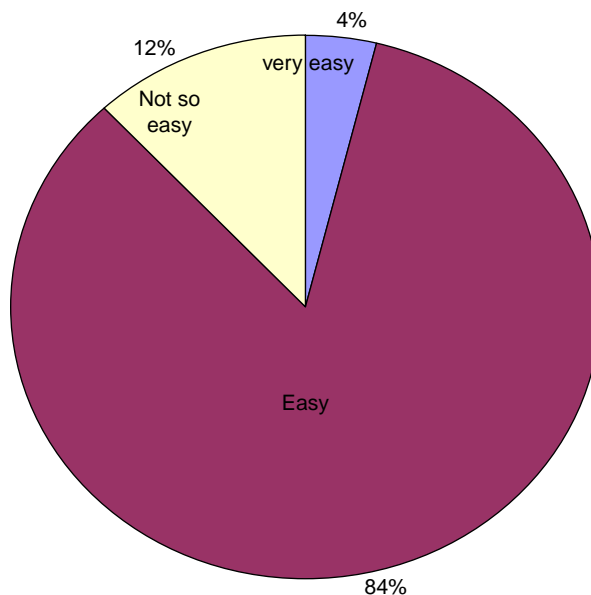

Figure 7. Perceived ease of use of the system.

posting according to the rules), while most found it 'medium to easy' (68 per cent) and a considerable percentage 'medium to difficult' (20 per cent) (Figure 8). Taking into account the high educational level of the participants, this result shows the inherent difficulty of using such a structured discussion tool (we expect that an 'average' education citizen will have more difficulties). This is due to the considerable mental effort required in order to think in the structured way that such a tool imposes, that is, to think 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., before entering a posting.

More clear is the picture with respect to the 'usefulness' of the structured e-forum, as a large majority of the participants (92 per cent) found it much better or a little better than the usual unstructured e-forum (in which there is no characterization/annotation of postings). This indicates that such a structured discussion tool results in more mentally processed, thoughtful, focused and therefore higher quality contributions by the participants; this is also due to the fact that these contributions are better associated with the ones of the other participants, so a better interaction among them is achieved, in comparison with the unstructured discussions taking place in the usual unstructured e-forum tools. Furthermore, a large majority of the participants found that the tools and technologies deployed in this technical platform are appropriate for promoting e-participation (both for informing citizens and for engaging them in productive online discussions), offering benefits not found in the 'traditional' participation and attracting citizens to use the platform again.

The persons who participated in the focus group qualitative discussion agreed that overall the use of the structured e-forum was a strength of the pilot, since it enables a more focused, productive and effective e-discussion. However, at the same time they emphasized some important difficulties for its users: (a) the difficulty of the correct assignment of type to the content of postings
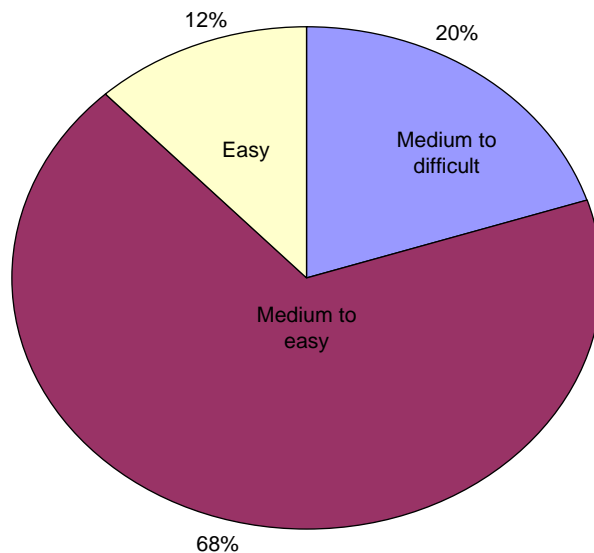

Figure 8. Perceived ease of use of the structured e-forum.

(an examination of the participants' postings in this e-consultation revealed that about 10 per cent of them had mistaken assignment of type, which confirms this difficulty), (b) the difficulty of wording appropriately the title of each posting, which is directly shown in the discussion tree of the structured e-forum box (while the full description of the posting is shown in another box only if its title is clicked in the tree), so that it reflects the content of the posting. Another problem mentioned was associated with the moderation of the postings: from the time one posting was entered by a user it usually took five to six 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 more postings associated with it, while other users could see it only after a long delay. Additionally, some weaknesses of the user interface were mentioned, for example, the platform should provide more space (i.e. a bigger box) for the structured e-forum, so that the users do not have to use so much scrolling up and down when trying to access previous participants' postings; also, the above-mentioned documentation and visualizations of the bill needed to be downloaded first over the Internet from the LEX-IS platform to the user's computer, then opened and studied separately, and afterwards the user had to enter the forum to make a posting, causing a lot inconvenience, so it was suggested that this informative material should be directly accessible by the user on a single 'click' in separate HTML pages.

Outcome

Finally we analysed the outcome of this pilot e-consultation. The extent of use of the platform by the participants (visits, use of informative material, postings) was satisfactory. A large majority of the participants characterize the quality of the contributions (postings) in this e-consultation as medium to high (76 per cent), a smaller percentage (16 per cent) as high and an even smaller percentage as medium to low (8 per cent) (Figure 9). Furthermore, a very high percentage of the participants (96 per cent) felt that they had learnt new things and ideas from the contributions (postings) of the other participants to a very good (4 per cent), good (44 per cent) or medium (40 per cent) extent.

For these reasons there is a high level of satisfaction of the participants with the whole e-participation process in this pilot (Figure 10) and also with their role in this process, and a large majority (96 per cent) would continue using this platform being interested to participate in such an e-consultation again. However, the participants felt uncertain about the impact of their contributions in this e-consultation on the legislation under discussion (i.e. on the final form of the law on the 'Contracts of Voluntary Cohabitation'); most of the participants (72 per cent) responded that they did not know whether the ideas and visions they expressed will be further considered and have an impact on this law, while a much smaller percentage had a positive feeling on this (20 per cent) (Figure 11). This feeling is probably associated (at least to some extent) with the low level of trust that many Greek citizens (and also citizens of many other countries as well) have in the political system, believing that politicians do not listen to them sufficiently, but are influenced mainly by a few economically and/or politically strong pressure groups.
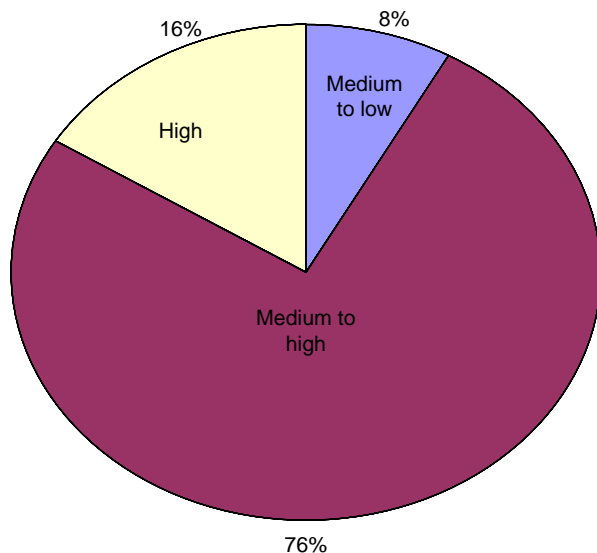
Figure 9. Perceived quality of contributions (postings).

In the focus groups' qualitative discussion there was a wide agreement that such e-consultations can be in the future a very useful and cost-effective tool for collecting opinions about bills under discussion from a wider group of people than the few (due to time limitations) representatives of the most important stakeholders invited in the parliamentary committees. The parliamentary officials and the MPs' assistants concluded that such tools can be useful to get the feel of public opinion on the issues discussed. Also, it has been stressed that such structured e-consultation tools can facilitate higher quality and more focused discussions.

However, it was pointed out that the political tradition in Greece is the Parliament for formulating the laws to take seriously into account the opinions

Figure 10. Level of satisfaction of the participants.

Figure 11. Beliefs of participants concerning the impact of their ideas and visions on the law.

of representatives of large stakeholder groups (e.g. presidents of chambers, associations, trade unions, etc.), who are not anonymous (so they are more responsible in expressing opinions), have a good experience and know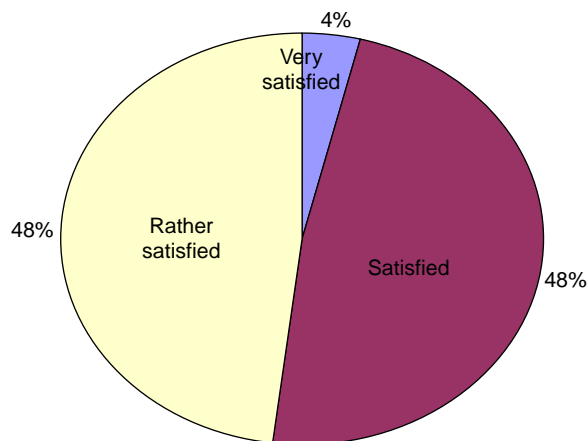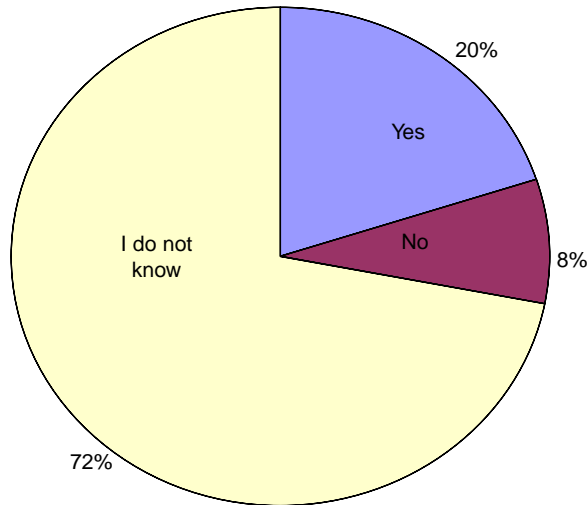ledge on the law under discussion and represent large numbers of affected citizens. On the contrary the opinions of 'simple' individuals, for whom we do not know how representative their opinions are, and to what extent they have experience and knowledge on the law under discussion, are taken into account to a much lower extent. Some of the participating students in this discussion argued that sometimes 'simple' individuals, who are anonymous and do not have any titles and responsibilities, can give to the parliament valuable information about thoughts, opinions and ideas in the society (or particular groups of it) concerning a law under discussion. However, this poses the risk of small extreme or even malicious groups attempting to use such e-participation platforms in order to impose their opinions and positions on the law discussed and promote their private agendas; all agreed that this would decrease the parliamentary usefulness and potential of such electronic political communication channels. For these reasons the parliamentary officials and the MPs' assistants would be reluctant to introduce such e-consultations in the law formation process unless properly protected through appropriate management procedures against extreme and malicious groups that would attempt to dominate these e-discussions; a wide participation of citizens in them would decrease this possibility.

The focus group also discussed extensively to what extent such an e-participation platform could prospectively offer a stand to the less powerful, excluded and non-participating in politics citizens. The structured forum was accepted as a discussion process with valid democratic characteristics and the Internet as a publicly accessible medium by nature. However, the technology would have to be provided to the excluded groups, invitations to contribute would have to be addressed to these groups and anonymity of opinions would have to be overcome in order for the postings to be seriously considered. Also, non-participating citizens who have a mistrust of the political system would still

have to be persuaded that the new means are equally followed by a new attitude of the law formulation process owners towards public opinion on the contents of a law under formation. Furthermore, the inherent difficulty of participating in such structured e-consultations (need for extensive processing of thoughts) might reduce the participation of individuals of lower education, so that higher education groups will finally dominate and promote their positions and agendas.

Finally, it was concluded that a good solution would be for the Parliament for each law under discussion to organize two e-consultations: (i) a closed one in a structured e-forum for particular invited eponym representatives of large stakeholder groups, such as presidents of chambers, associations, trade unions, etc., and experts, enabling a larger number of them to participate and a more focused and in-depth discussion to take place, and (ii) an open one in a usual unstructured e-forum tool for anonymous individuals, who want to express their personal opinion.

Conclusions

In the previous sections of this paper has been described and evaluated the first attempt of the Greek Parliament to increase the quantity and quality of public participation in the legislation formation process using two advanced ICTs, computer supported arguments visualization and structured e-forum, which are based on previous theoretical work on the wicked problems and the argumentative approach to solving them. Initially the technical platform developed for this purpose has been presented. Its basic component is a structured e-forum tool, in which structured e-consultations can take place; it requires from the participants according to the IBIS theoretical framework: (i) to annotate semantically each new posting as issue, alternative, pro-argument, contra-argument or comment, and (ii) to associate it to a previous posting according to predefined rules: for each issue it is allowed to enter other issues, alternatives or comments, for each alternative to enter pro-arguments, contra-argument or comments, for each argument (pro or contra) other arguments (pro or contra) and for each comment other comments. This imposes a higher structure and organization in the e-consultation. Another important component of this technical platform is an information space providing background information to the participants in the e-consultations about the bill under discussion: this includes both the main documents of it (justification report, main content (articles), report of the discussion in the competent parliamentary committee) in textual form and also visualizations of their main points based on the IBIS theoretical framework. These visualizations had the form of maps of interconnected question nodes (issues, problems), idea nodes (solutions, settlements), argument nodes (positive ones corresponding to advantages and negative ones corresponding to disadvantages) and information nodes; they aim to present the most important information of the corresponding documents in an easily understandable and structured schematic manner. Using this technical platform a pilot e-consultation was held on a highly controversial bill concerning the 'Contracts of Voluntary Cohabitation'. For evaluating it a multi-perspective evaluation methodology was developed, through a synthesis of elements from existing traditional public participation and e-participation evaluation

frameworks, taking also into account the particular characteristics of the legislation formation process. It includes four evaluation perspectives, the context, the process, the system and the outcomes of the e-consultation, which have been used both for quantitative and qualitative evaluation of the pilot.

It has been concluded that the visualizations of the main parliamentary documents (justification reports, main content/articles, minutes of discussions in parliamentary committees) are understandable and also can convey the main points of the above documents to a good extent; the only exception identified was in the visualizations of the bill articles, in which the settlement type of nodes seems too generic and has to be broken into several subtypes representing the various kind of legal rules included in a bill, such as prohibitive, imperative, permitting and presumptions. Therefore, the use of computer supported arguments visualization technologies seems to have a good potential in this area: they allow more citizens to be informed about the main points of legislation under formation and the opinions/positions of the political parties and knowledgeable experts on it, without having to spend too much time on this, or to be familiar with the complex legal and technical language of the parliamentary documents. In modern societies the main problems/issues which are regulated by parliaments tend to be highly complex and multi-dimensional, and 'simple citizens' find it difficult to understand them, so they tend to withdraw from the public discussion on them, leaving them to the representatives, the experts and the organized pressure groups. This can undermine public participation in the formation of legislation and finally result in 'unbalanced' legislation, which takes into account and incorporates mainly the agendas and interests of some social groups (e.g. organized minorities) and minimally the ones of some others. The use of computer supported arguments visualization technologies has the potential to counter this trend, reducing the effort and time requirements of being informed on current political debates, promoting two fundamental values of parliaments: transparency and accountability.

At the same time these visualizations include and focus the attention of the citizens on the 'substance' of the parliamentary documents: the main problems/issues they identify, the solutions they propose together with their advantages and disadvantages, and 'filter out' the excessive political rhetoric or other irrelevant material. Taking into account that the political debate in Greece (and in many other countries as well) has been criticized for having too much political rhetoric, generalities and lack of specific positions, solutions and arguments on the problems and needs of the society, these technologies have the potential to contribute to the improvement of the quality of both online and offline political debate, making it more substantial and argumentative. However, in order to have these important benefits it is necessary that these visualizations are constructed by a highly skilled, neutral and trusted group, so that they include the really important points but are not overloaded with too much detail, and at the same time they do not hide something important. For Greece we believe that the Legal Service of the Parliament (which processes all bills coming to the Parliament in order to identify legal problems or problems of incompliance to the Constitution), possibly in cooperation with a university, would be the most appropriate entities for constructing these visualizations.

Another interesting conclusion is that the use of a structured e-forum tool can considerably improve the quality of e-consultations in comparison with the usual

unstructured e-forum tool. This is because the former guides the participants to think in a more structured way about the bill (or in general the topic) under discussion than the latter: it guides them initially to identify which are the main problems/issues, then to search for possible solutions to them, and finally to examine the main advantages and disadvantages of them. Additionally the structured e-forum tool guides the participants to associate each new posting with a previous one according to predefined rules, and in this way it improves the interaction among the participants. Therefore, the structured e-forum drives the participants to make more mentally processed and focused contributions, increasing the quality, focus and effectiveness of the discussion. This conclusion is in agreement with the ones of previous studies of other mechanisms of structuring electronic discussion and cooperation, such as moderation, scripts providing guidance to participants, different leadership styles,[18] which conclude that these structuring mechanisms have a positive impact on the efficiency and effectiveness of discussion and cooperation. For the above reasons the use of a structured e-forum by parliaments has the potential not only to widen public participation on legislation under formation (beyond the few stakeholders' representatives invited in the competent parliamentary committee) but also to improve its quality (leading to e-consultations with more substance, arguments and coherence), promoting two fundamental values of parliaments: accessibility and representativeness.

However, the adoption of such e-consultation tools by parliaments might increase the existing and widely debated 'digital divide'.[19] Some groups of modern societies (e.g. people of low income, low education or old age) do not have access to ICTs and competences to use them, and this limits their capabilities to participate in the highly ICT-dependent modern economy and society, and finally increases the already existing social inequalities and 'divides'. Therefore, these groups will not be able to benefit from such electronic information provision and consultation tools provided by the parliaments and from the participation opportunities they create, and this will increase further their handicaps and disadvantages with respect other groups having ICT access and competences. Also, taking into account that as concluded from our evaluation the structured e-forum is not easy to use, due to the considerable mental effort required in order to think in the structured way it imposes, it might be less suitable for and usable by lower education groups of the society. Therefore, the above-mentioned benefits it provides (increase of the quantity and quality of public participation in the legislation formation) might be limited to the higher education groups, and this will be another factor increasing the

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[18] G. Mark, J. Grudin and S. Poltrock, 'Meeting at the desktop: an empirical study of virtually collocated teams', in *Proceedings of the Sixth European Conference on Computer-Supported Cooperative Work*, Kluwer Academic, Norwell, MA, 1999; S. Farnham, H. R. Chesley, D. E. McGhee and R. Kawal, 'Structured online interactions: improving the decision-making of small discussion groups', in *Proceedings of ACM 2000 Conference on Computer-Supported Cooperative Work* (*CSCW 2000*), ACM Press, New York, 2000; S. Kahai, J. Fjermestad, S. Zhang and B. J. Avolio, 'Leadership in virtual teams: past, present, and future', *International Journal of E-Collaboration*, 3(1), 2007, pp. 1–8.

[19] OECD, *Learning to Bridge the Digital Divide*, OECD Publication Service, Paris, 2000; P. Norris, *Digital Divide: Civic Engagement, Information Poverty, and the Internet Worldwide*, Cambridge University Press, New York, 2001; K. Mossberger, C. J. Tolbert and M. Stansbury, *Virtual Inequality: Beyond the Digital Divide*, Georgetown University Press, Washington, DC, 2003; OECD, *The e-Government Imperative*, OECD Publication Service, Paris, 2003.

existing digital divide. Another problem of such e-consultations is that the participants are anonymous, so we do not know how representative are the positions/opinions expressed by each of them, and how much experience and knowledge on the topic under discussion each of them has; also, it is possible these e-consultations are finally dominated by small extreme or even malicious organized groups who want to impose their positions and agendas.

For reducing the above risks parliaments can organize for each bill under discussion several e-consultations with various levels of structure and for different target groups. In particular a closed e-consultation can be organized in a structured IBIS-based e-forum for particular invited eponym representatives of large stakeholder groups, such as presidents of chambers, associations, trade unions, experts and MPs of the competent parliamentary committee. Additionally, an open e-consultation can be organized in a usual unstructured e-forum tool for anonymous individuals, who want to express their personal opinion. Furthermore, some thematic (i.e. focusing on particular important topics) open e-consultations can be organized in e-forum tools of lower structure; they can be based either on the IBIS model, or on other less structured ones, such as the 'question–answer–comment' model,[20] which is easier for the participants and demands less metal effort from them. At the same time a good promotion of these e-consultations can ensure a wide participation of citizens, so that it is difficult for organized groups/minorities to dominate. Finally governments should continue, despite the economic crisis, their efforts to provide free ICT/Internet access and training to citizens who cannot afford it (e.g. in municipal Internet centres).

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[20] E. Loukis and M. Wimmer, 'Analyzing different models of structured electronic consultation on legislation under formation', in *Proceedings of the 4th International Conference on Online Deliberation—OD 2010*, Leeds University Business School, Leeds, 30 June–2 July 2010.

Appendix A

Titles of the 13 main articles of the bill on 'Contracts of Voluntary Cohabitation':

(1) Establishment
(2) Pre-conditions
(3) Invalidity
(4) Dissolution
(5) Surname
(6) Possessions
(7) Palimony
(8) Fatherhood Presumption
(9) Children Surname
(10) Parental Care
(11) Inheritance Rights
(12) Suspension of Cancellation
(13) Application Scope.

Appendix B

Questionnaire of the quantitative evaluation:

I. Context

Q-CONT1: What is your age group?
Q-CONT2: What is your gender?
Q-CONT3: What is your educational level?
Q-CONT4: Do you find the topics discussed in the platform appealing and interesting?
Q-CONT5: How would you judge the importance of the topics discussed?

II. Process

Q-PRO1: Are you aware of the purpose and objectives of the LEX-IS project?
Q-PRO2: Was it clear who were the participants in this e-participation project and what was their role?
Q-PRO3: Were there sufficient and appropriate rules and management in this e-consultation?
Q-PRO4: Was there adequate time for getting informed on the law and then for discussing electronically about it on the platform?
Q-PRO5: Was the information provided to you about the law sufficient?
Q-PRO6: Was the information provided to you about the law understandable and clear?
Q-PRO7: Was the information provided to you about the law precise and objective?
Q-PRO8: Was it easy for you to understand the visualizations?
Q-PRO9: Were the visualizations enough or did you feel the need to access the reference text in order to understand them?

Q-PRO10: To what extent did the visualization of the justification report of the law help you to understand its content in a short timeframe?

Q-PRO11: To what extent did the visualization of the articles of the law help you to understand their content in a short timeframe?

Q-PRO12: To what extent did the visualization of the expert and party reports on the law help you to understand their content in a short timeframe?

III. System

Q-SYS1: Do you think the platform (the sum of tools and information provided online) is easy to use?

Q-SYS2: Do you think learning to operate the platform is unproblematic? Does the platform allow an intuitive handling?

Q-SYS3: How easy it was to use the structured forum (i.e. to correctly characterize your idea as an issue, an alternative, a pro-argument, a contra-argument or a comment, and then correctly enter it in the structured forum)?

Q-SYS4: How easy it was to access, read and understand the postings of the other participants (issues, alternatives, pro-arguments, contra-arguments, comments) and the connections among them in the structured forum?

Q-SYS5: What is your general assessment of the structured forum as a tool for important e-consultations in comparison to the normal forum tools (where you do not have to characterize your posting as an issue, an alternative, a pro-argument, a contra-argument or a comment, and then enter it correctly)?

Q-SYS6: Overall, would you say that the tools and technologies deployed in the platform are appropriate for the online participation in the project?

Q-SYS7: Overall, would you deem the tools and technologies deployed in the platform appropriate for the topic discussed?

Q-SYS8: Do you miss certain participation functionalities and services, which were not provided in the online platform but which you may know from other participation experiences?

Q-SYS9: Does the platform offer benefits you have not found in traditional participation, which attract you to use the platform again for having your say in democratic participation?

Q-SYS10: Does the platform provide proper participation tools to sufficiently inform you about the topics under discussion?

Q-SYS11: Does the platform provide proper participation tools and structuring mechanisms to engage in the online discussion of the topics?

IV. Outcome

Q-OUT1: How often did you visit the platform?

Q-OUT2: How often did you contribute, e.g. by posting an opinion, by participating in an opinion poll, etc.?

Q-OUT3: Will you come back to participate again after the project terminates?

Q-OUT4: Will you continue to use the platform?

Q-OUT5: How do you assess the quality of the contributions (postings) entered by the participants in this e-consultation?

Q-OUT6: To what extent did you learn new things and ideas from the contributions (postings) entered by the other participants in this e-consultation?

Q-OUT7: Through your contributions, did you reach an impact in the legislation theme discussed online?

Q-OUT8: Are you satisfied with the influence you achieved?

Q-OUT9: Do you think your ideas and visions will be further considered?

Q-OUT10: Does the result you have expected match the result you have received?

Q-OUT11: Do you like the role you are playing in the process?

Q-OUT12: How satisfied were you with the process?

Q-OUT13: Did you use the visualizations of the articles of the law, the expert reports and the party positions, provided in the platform?