Information Communication Technologies and the Virtual Public Sphere:

Impacts of Network Structures on Civil Society

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Chapter 8

An Investigation of the Use of Computer Supported Arguments Visualization for Improving Public Participation in Legislation Formation

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ABSTRACT

It has been argued that representative democracy, in order to be effective and address the problems and needs of different groups, and also at the same time legitimate and acceptable, should be combined with public participation (both off-line and on-line) of individual citizens and the civil society. However, the participation of citizens (either as individuals or as representatives of groups or any type of collective entities) in political debates in order to be meaningful and effective needs to be informed, which necessitates extensive study of large amounts of relevant material, such as reports, laws, committees' minutes, opinions expressed by experts, stakeholders, political parties, et cetera. Most of this material is in a legalistic or in other specialist languages, or in a political rhetoric style that hides their substance, making it less discernible. The above problems are putting barriers to a meaningful and effective participation. This chapter presents research on the use of 'Computer Supported Argument Visualization' (CSAV) methods for addressing these problems and supporting and enhancing public participation in the legislation formation process. Based on an analysis of this process and its main documents, a comprehensive approach to the use of CSAV in the legislation formation process is designed, which covers

all its fundamental stages and documents, and assists citizens and civil society groups to participate in it in a meaningful and effective manner with a reasonable amount of effort. It is based on the issue-based information systems (IBIS) framework. This approach has been implemented in a pilot e-participation project in the Greek Parliament, which was then evaluated based on the 'Technology Acceptance Model' (TAM) with positive results. Based on the conclusions of this evaluation an enrichment of the IBIS framework has been developed for improving the visualization of the main content (articles) of bills and laws.

INTRODUCTION

It has been argued that representative democracy, in order to be effective and address the problems and needs of different groups, and also at the same time legitimate and acceptable by the society, should be combined with public participation of individual citizens and the civil society. This line of thought, in combination with the declining trust of citizens in government and lower interest in politics, gave rise to new model of democracy, termed as "participatory democracy" (Pateman, 1970; Macpherson, 1977; Barber, 1984; Held, 1987; Fishkin, 1991). A key principle of this model is that "the equal right to self-development can only be achieved in a participatory society, a society which fosters a sense of political efficacy, nurtures a concern for collective problems and contributes to the formation of a knowledgeable citizenry capable of taking a sustained interest in the governing process" (Held, 1987, p. 262). A major value of this model of democracy is public participation, defined by Row & Frewer (2004) as 'the practice of consulting and involving members of the public in the agenda-setting, decision-making and policy forming activities of organizations or institutions responsible for policy development'; they view it as a move away from an 'elitist model', in which managers and experts are the basic source of regulations and public policies, to a new model, in which citizens have a more active role and voice. However, the objective of participatory democracy is not the overthrow of the establishment and the implementation of a new

order; it aims mainly to function as a remedial and not as a revolutionary measure. It does not foster conflicts among social groups of each society, but tries to feature a practical way of coexistence; the basic idea of this model is the exchange of views among citizens, in order to form a core, a synthesis of their opinions. In this direction Barber (1984, p. 174) argues that discussion among opposing views 'entails listening no less than speaking, it is affective as well as cognitive...'.

Governments of many countries all over the world have attempted to put in practice the above ideas, promote public participation and strengthen their relations with the citizens, regarding them as sound investments in better policy-making and as a core element of good governance (Organisation for Economic Cooperation and Development, 2003a, 2003b and 2004a). The explosive increase of the penetration and use by more and more citizens of Information and Communication Technologies (ICT), and especially the Internet, gave rise to the development of e-participation. Governments of many countries attempt to extend citizens' participation in public policies formulation and politics in general through the use of ICT for supporting i) the provision of relevant information to the citizens, ii) the consultation with them and also iii) their active participation (Macintosh, 2004; Organisation for Economic Cooperation and Development, 2004b; Timmers, 2007).

It is widely recognized that the above two higher levels of e-participation, aiming at the consultation with the citizens and their active participation, have as basic precondition the first

one, aiming at the provision sufficient relevant information to them. The quality of both the 'traditional' off-line participation and the more recent e-participation, and in general of any type of political debate, relies critically on how informed the participating citizens are on the problem under discussion, its multiple dimensions and the opinions that have been previously expressed on it. Elliman, Macintosh & Irani (2007, p. 33) state that 'Democratic political participation must involve both the means to be informed and deliberative mechanisms to take part in the decision-making'. However, most public policy design problems (e.g. development of plans, programs, regulations, legislation) are 'wicked' (Rittel & Weber, 1973), being characterised by high complexity, many different perspectives and dimensions, and multiple and usually conflicting stakeholders' groups with heterogeneous views, values and concerns. Therefore citizens interested to participate in such debates, in order to be sufficiently informed and make a meaningful contribution, should study large amounts of relevant material, such as reports, plans, laws, committees' minutes, opinions expressed by experts, stakeholders, political parties, etc. Most of this material is in a legalistic or in other specialist languages, or in a political rhetoric style that hides their substance making it less discernible. At the same time many citizens today do not have enough time for such extensive study, and some of them lack the required education and analysis skills. The above problems are putting barriers to a meaningful and effective public participation (both 'on-line' and 'off-line'). Furthermore, the increasing complexity of social problems and needs recently (e.g. due to the internationalization of the economy, the new technologies, the environmental threats) make more citizens think that it is not possible to understand them and form meaningful opinions and positions; this drives a gradual move back towards an 'elitist model', in which managers and experts have the main role in addressing the

complex social problems and needs and public participation is limited.

In this chapter we present our research on the use of 'Computer Supported Argument Visualization' (CSAV) methods for addressing these problems, and supporting and enhancing public participation in one of the most important activities of democracy, the formation of legislation. Based on an analysis of the legislation formation process and its main documents in the Greek Parliament initially we designed a comprehensive approach to the use of CSAV in this critical process, which covers all its fundamental stages and documents, and assists citizens and civil society groups to participate in it in a meaningful and effective manner with a reasonable amount of effort. This approach has been implemented in a pilot e-participation project in the Greek Parliament, which was evaluated based on the 'Technology Acceptance Model' (TAM) with positive results. Based on the conclusions of this evaluation an enrichment of the IBIS framework has been developed for improving the visualization of laws. The research presented in this chapter has been 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) co-funded by the 'eParticipation' Preparatory Action of the European Commission (Loukis et al., 2007).

In next section the background of our research is outlined, while in the following section is described the development of a comprehensive approach to the use of CSAV in the legislation formation process. Next is presented the above-mentioned pilot application of this approach, and then its evaluation. They are followed by a section describing an enrichment of the IBIS framework we propose for improving the visualization of the main points of laws' content based on the results of the evaluation, while in the final section our conclusions are outlined.

BACKGROUND

Computer Supported Argument Visualization (CSAV) is the compact representation in a diagrammatic form of a set of arguments, usually contained in textual documents or expressed in debates, using a set of interconnected nodes of various types. It has been used successfully mainly in the domains of law and education, in order to teach critical thinking, presentation and defence of a point of view with arguments and provision of complex information in an organized manner, while their use in the political domain has only recently started (Macintosh, Gordon, & Renton, 2009). Arguments visualization was introduced by Wingmore (1913), who proposed a 'chart method' for representing in a simplified diagrammatic form the extensive material of legal cases, which assists in gaining a better understanding of the substantial elements and reaching conclusions; his charts show how different kinds of evidence (such as 'Testimonial Assertions' or 'Circumstances') are assembled in order to support or challenge various 'Propositions'. Toulmin (1958), building on Wingmore's work, developed a model (language) for formulation and analysis of arguments, which is based on a notation consisting of five components: facts or observations ('Datum'), which through logical steps ('Warrant' which can be supported by a 'Backing') lead to consequent assertions ('Claim'), though exceptions ('Rebuttal') can be also be added to them. This model, and in general Toulmin's analysis of the logical structure of arguments, was a sound foundation for many subsequent developments and applications.

The introduction and wide penetration of computers gave a boost to argument visualization, leading to the development of the CSAV domain, and also to the expansion of its practical application in various domains, such as education, products design, analysis of environmental impacts, commerce, research, etc. (Kirschner, Buckingham Shum & Carr, 2003). CSAV can be very useful for solving a class of complex problems termed by Rittel & Weber (1973) as 'wicked', in contrast to the simpler 'tame' problems. Wicked problems lack mathematically 'optimal' solutions and pre-defined algorithms for calculating them, and have only 'better' and 'worse' solutions, with the former having more positive arguments in favour them than the latter. Kunz and Rittel (1979) suggest that wicked problems are most effectively countered by argumentation among stakeholders, in which each stakeholder group can express the particular issues and perspectives of the problem they regard as significant, possible actions for addressing them and also their advantages and disadvantages; CSAV can be very useful in supporting such an argumentation. Also, in the same paper is proposed the use for this purpose of 'Issue Based Information Systems' (IBIS), which aim 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'*. They are based on a simple but powerful framework for the representation of such problems, 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) (Kunz & Rittel, 1979; Conklin & Begeman, 1989; Conclin, 2003).

Most public policy design problems (e.g. development of plans, programs, regulations, legislation) belong to this class of wicked problems, since they are characterised by high complexity, many different perspectives and dimensions, and have multiple stakeholders with heterogeneous views and concerns. These characteristics have a negative impact on the quantity and quality of the political debates on most public policies, putting barriers to both 'on-line' and 'off-line' public participation. However, limited research has been conducted on how we can use methods of CSAV for conveying compact political information to the

citizens on the substantial points and arguments of important political debates and documents in an easily and quickly understandable form, and how useful such an approach can be for the citizens. Renton & Macintosh (2007) identify this research gap stating that 'The use of argument visualization in a political context is still in its infancy', while more recently Macintosh, Gordon and Renton (2009) confirm this and argue that the use of these methods in the political domain 'is only just emerging'.

In the following we briefly review this limited previous research concerning the use of CSAV in the political domain. Renton (2006) investigates the use of CSAV in order to present in a compact and clear manner to the public complex political issues and arguments raised in Parliamentary debates. For this purpose he took the minutes of two debates from the Scottish Parliament concerning the introduction of the 'Terrestrial Trunk Radio Masts' (TETRA) and the 'Antisocial Behaviour', converted them into argument maps based on the IBIS framework using the 'Compendium' tool (Selvin, Shum, & Sierhuis, 2001) and then had them evaluated through qualitative interviews with members of the Scottish Civic Forum with positive results. He represented both these debates through argument maps showing the main questions raised by the Members of Scottish Parliament, ideas for addressing them, and also positive and negative statements on them; also, he connected some of these elements with relevant full text from the minutes of these debates. Renton & Macintosh (2005 and 2007) propose a systematic approach of using a set of maps for representing political debates concerning public policies and bills using icons and arrows, aiming to form in this way an electronic 'policy memory' for supporting policy development and citizens' engagement and deliberation. This approach includes the development of three kinds of maps: overview maps (providing a visualization of the main stages in the development of a bill), dialogue maps (showing

the sequence of contributions of representatives of parties and stakeholders in a chronological order) and argument maps (showing in the form of decision trees the opinions expressed in this debate for various topics and questions). Also, they present an application of this approach for constructing a set of maps representing the discussion that took place in the Scottish Parliament concerning the 'Smoking in Public Spaces' policy. Ohl (2008) describes the application of CSAV for the diagrammatic representation of citizens' submissions in a public discourse on a draft South East Queensland Regional Plan, which aims to promote government transparency and accountability. For this purpose he uses an initial 'index map' visualizing the basic issues and questions posed by Queensland State Government, each of them being linked to a particular map visualizing citizens' opinions on it (for open questions), or showing relative frequencies of citizens' responses (for closed questions). All these maps are based on the IBIS framework and have been constructed using the abovementioned 'Compendium' tool.

Further research is required in order to formulate appropriate approaches and practices for using CSAV in the area of politics, in different stages of public policies, programs and legislation lifecycle, for different purposes and audiences, and also in order to evaluate in 'real-life' such approaches, practices and tools, and identify advantages, disadvantages and possible improvements. Our research is contributing in this direction by developing and evaluating a comprehensive approach to the use of CSAV in one of most important activities of democracy, the legislation formation process, which covers all the fundamental stages and documents this process includes. It aims to assist citizens and civil society groups to participate in the legislation formation process in a meaningful and effective manner with a reasonable amount of effort, and therefore to improve the quantity and quality of the relevant political debate.

A COMPREHENSIVE APPROACH TO THE USE OF CSAV IN THE LEGISLATION FORMATION PROCESS

In order to develop such a comprehensive approach to the use of CSAV in the legislation formation process, we adopted the following methodology:

i)   initially we analyzed the process of legislation formation in the Greek Parliament, the stages it includes and its main documents,
ii)   based on this analysis, we designed our approach with respect to the visualizations that should be constructed,
iii) then we designed our approach with respect to the most appropriate framework and tool to be used for these visualizations,
iv)   as a next step we proceeded to a pilot 'real-life' application of the above approach for a bill under discussion in the Greek Parliament,
v)   then we evaluated this pilot application,
vi)   and finally, based on the conclusions of the evaluation, we made some improvements in our approach.

In particular, in order to understand and analyze the process, stages and documents of legislation formation we conducted interviews with three experienced officials of the Greek Parliament. Additionally we studied carefully and analyzed the justification reports and the main content (articles) of five laws from five different Ministries, which have been proposed to us by the above three officials of the Greek Parliament as being representative. Additionally, we studied carefully and analyzed the minutes of the sessions of the competent Parliamentary committees in which these laws were discussed, and also of the corresponding plenary sessions.

From this analysis it was concluded that the legislation formation process includes some fundamental stages, which are strictly defined by law, each of them adding some 'value' to the bill (sug-gestions for modifications, improvements, etc.) and producing some fundamental documents in which this value added is documented. These fundamental documents are the justification report of the bill, its main content (articles) and the minutes of its discussion in the competent Parliamentary committee and also in the corresponding plenary sessions of the Parliament. Therefore in order to give to the interested citizens and civil society groups a full picture of a bill under formation in order to participate effectively in the formation process, it is necessary to provide them one hand 'individual' visualizations of these fundamental documents:

a)   the justification report of the bill, representing clearly the main reasons that necessitate it (e.g. some social problems or needs) and the basic directions and solutions it provides,
b)   the main content of the bill, representing clearly the issues settled by each article, and the particular settlements provided for them,
c)   the opinions and positions on the bill of each of the stakeholders' representatives and experts invited in the competent Parliamentary committee (as recorded in its minutes), representing clearly the main strengths, weaknesses and suggestions he/she mentions,
d)   the positions on the bill of each of the political parties' main speakers in the competent Parliamentary committee (as recorded in its minutes), representing clearly the main strengths, weaknesses and suggestions he/she mentions,

and on the other hand some 'synthetic' visualizations, such as:

e)   a synthetic visualization of all strengths, weaknesses and suggestions mentioned by the stakeholders' representatives and experts invited in the competent Parliamentary committee for this bill,

f)   a synthetic visualization of all strengths, weaknesses and suggestions mentioned by the main speakers of the political parties for this bill,

or even a combination of e and f (if it not too complex). Additionally, it is useful to construct an 'overview map' as well, as a starting point for the user, which includes nodes representing all the above visualizations, and also the corresponding textual documents, providing hyperlinks to them.

For these visualizations we decided to use initially the IBIS framework (Conklin & Begeman, 1989; Conclin, 2003), as implemented by the 'Compendium' tool (http://compendium.open. ac.uk/institute/) (Selvin, Shum, & Sierhuis, 2001), because they are mature, and have been used extensively in the past for arguments visualization in several domains, including the domain of politics, as mentioned in the previous section. They provide a simple, understandable and at the same time powerful typology of nodes, which have been proved to be sufficient for the representation of wicked problems in various domains, including politics. However, in the evaluation of the pilot application it will be assessed to what extent the nodes typology provided by the IBIS framework is sufficient for the above visualizations, and if not the required enrichments will be made.

A PILOT APPLICATION

A pilot application of the above approach to the use of CSAV in the legislation formation process was made, in an e-consultation conducted in the Greek Parliament as part of the LEX-IS project (www.lex-is.eu) (Loukis et al., 2007), on a bill concerning the 'Contracts of Voluntary Cohabitation'. This controversial bill regulated the matter of the formal voluntary co-habitation of two persons. It formalized an social situation existing for long time in Greece: many couples, especially among the younger age groups, are reluctant to proceed directly to marriage, and choose to live together for long periods of time; during that time many of them have children, share living expenses and buy property, just to mention some of their most important common actions, and these needed to be regulated.

Before the beginning of this e-consultation we constructed the visualizations mentioned in the previous section for this bill, which were provided to the participants, together with the corresponding textual documents, as basic reference material. From these visualizations some representative ones are shown below.

The initial overview map is shown in Figure 1. It includes four map nodes, representing the visualizations of the bill justification report, the bill content, the invited experts' opinions and the

Figure 1. Overview map
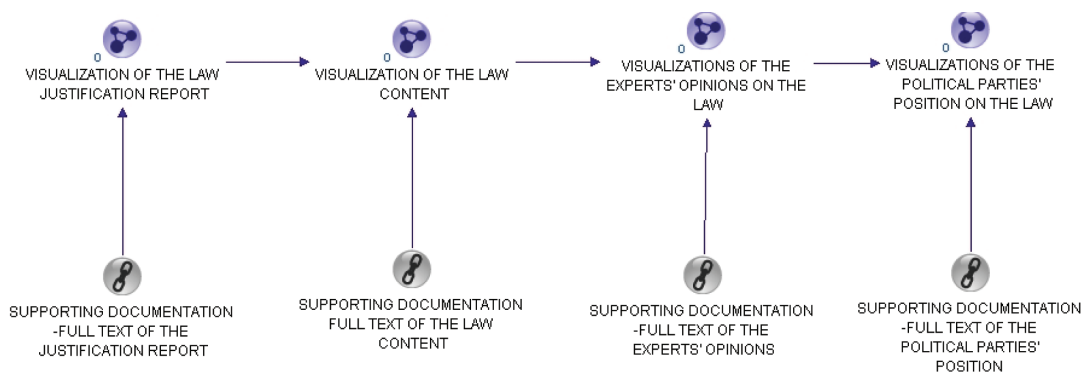
parties' positions on it, arranged horizontally in chronological order, which are hyperlinked to the corresponding visualizations; also, it includes four reference nodes hyperlinked to the corresponding textual documents.

The visualization of the justification report is shown in Figure 2. It includes three of the types of nodes supported by the tool, with an adaptation of their meaning: note/information nodes (adapted as 'clarification' nodes), question nodes (adapted as 'problem-need' nodes) and idea nodes (adapted as 'solution' nodes). It is structured in four layers. The first layer includes (modelled as clarification nodes) the reasons that create the need to legally regulate the voluntary cohabitation, which is modelled through a problem-need node in the second layer. The third layer represents this bill concerning the 'Contracts of Voluntary Cohabitation' as the basic solution for addressing this need, while the fourth layer includes the general directions of the law and the particular

solutions it provides (modelled through solution nodes), and also a clarification on it, further elaborated by two more clarifications (all modelled as clarification nodes).

The visualization of the main content of the bill that we constructed was quite lengthy, so we decided to break it into: i) one 'high level visualization', which shows the main issues regulated by the articles of the bill (as issue nodes) (Figure 3), and also ii) one 'lower level visualization' for the content of each article; since the bill includes 13 articles, we constructed 13 corresponding visualizations of them (in Figure 4 we can see the visualization of the content of the 7th article). For the visualization of the content of the bill we used four of the types of nodes supported by the tool with an adaptation of their meaning: question nodes (adapted as 'issue' nodes), idea nodes (adapted as 'settlement' nodes), note/information nodes (adapted as 'clarification' nodes) and map nodes (in the high level visualization, for provid-

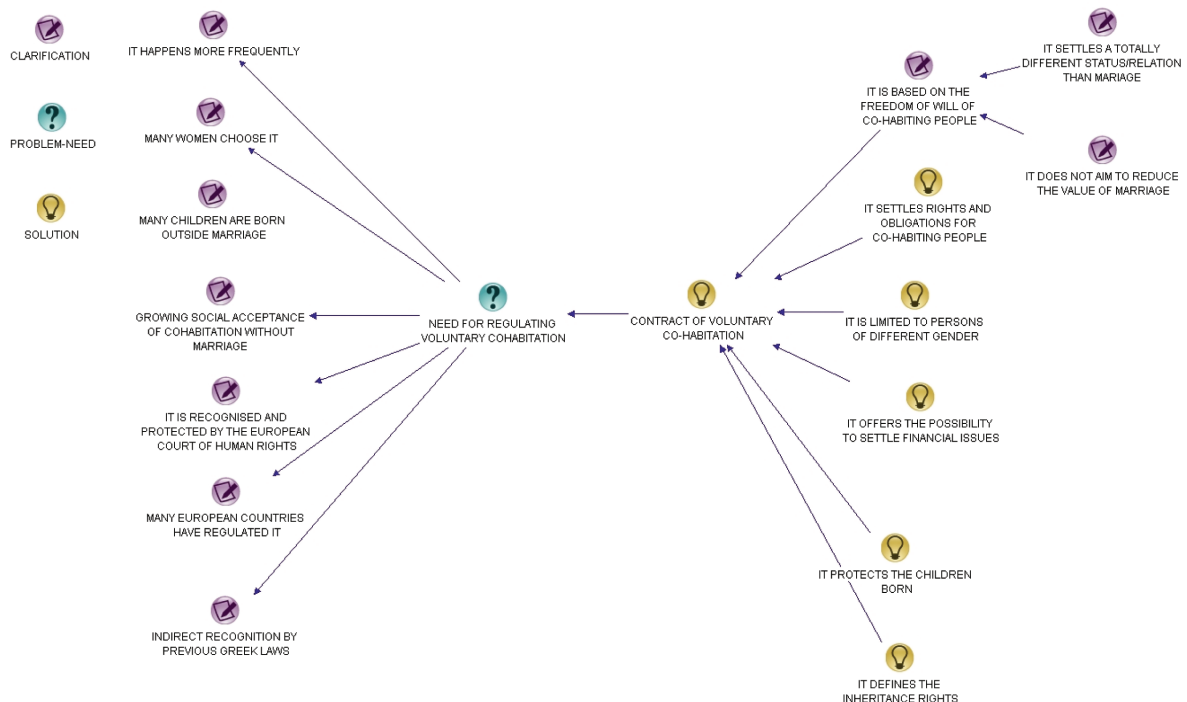*Figure 2. Visualization of the justification report of the Bill*

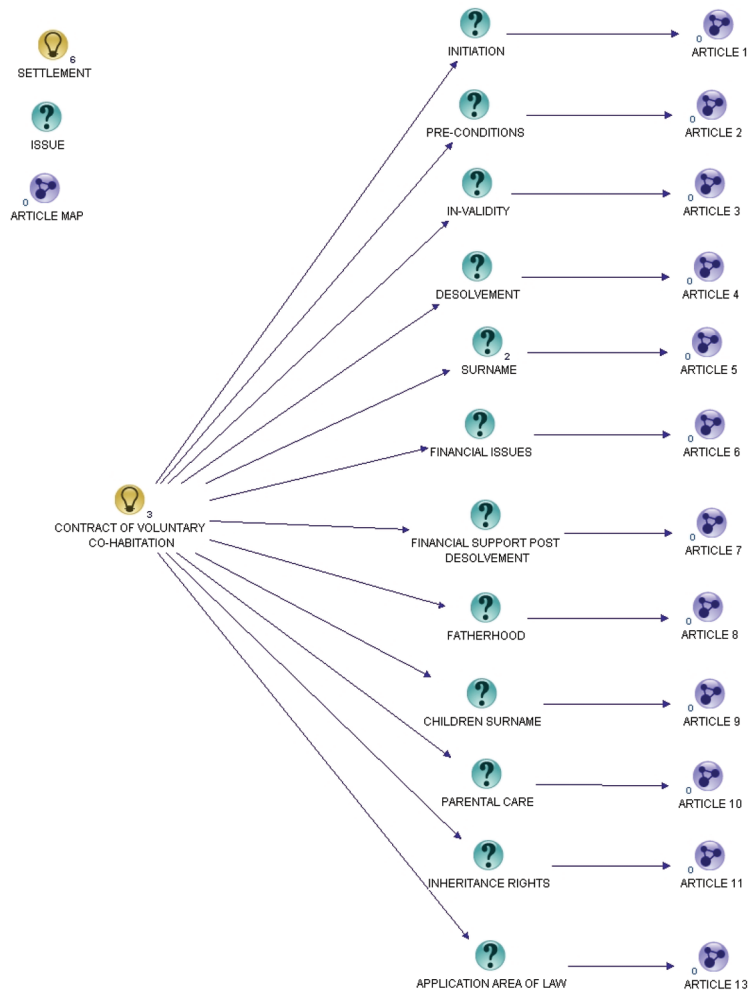*Figure 3. High level visualization of the content of the Bill*

Figure 4. Lower level visualization of the content of the 7th article of the Bill
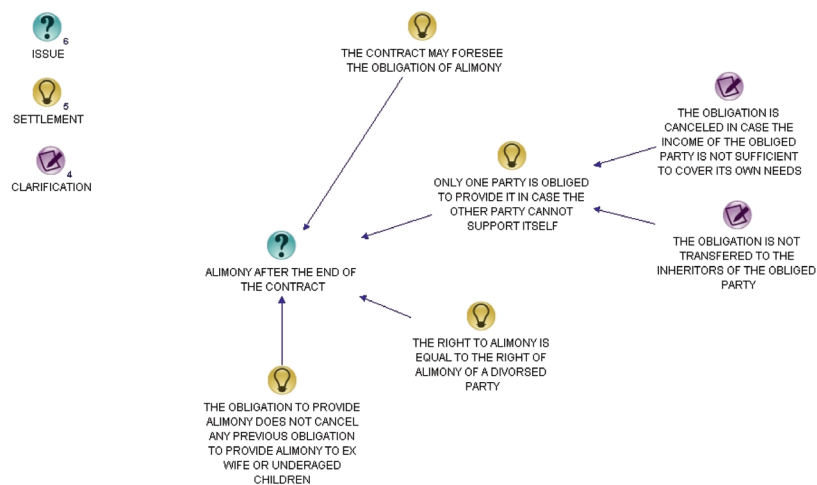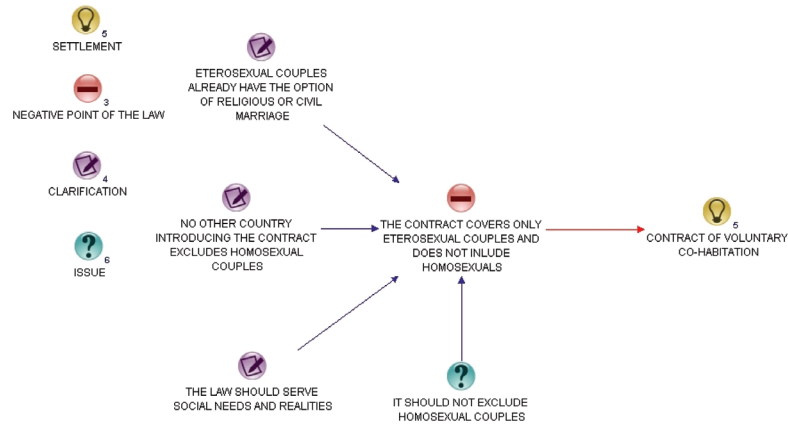
Figure 5. Visualization of the opinion of an expert

ing hyperlinks to the lower level visualizations of the articles).

The visualization of the opinion on the bill of one of the experts invited by the competent Parliamentary committee is shown in Figure 5. It includes four of the types of nodes supported by the tool, again with an adaptation of their meaning: one idea node (adapted as 'settlement' node) representing the whole bill, one contra-argument node (adapted as 'negative point' node), note/ information nodes (adapted as 'clarification'

nodes), and one question node (adapted as 'issue' node). We can see that this expert mentioned one main weakness of this bill, which poses one basic issue, and also added three clarifications on this weakness.

In Figure 6 we can see the visualization of the position of one political party on this bill. It includes four of the types of nodes supported by the tool, with similar adaptations of their meaning: one idea node (adapted as 'settlement' node) representing the whole bill, contra-argument nodes

Figure 6. Visualization of the position of one political party
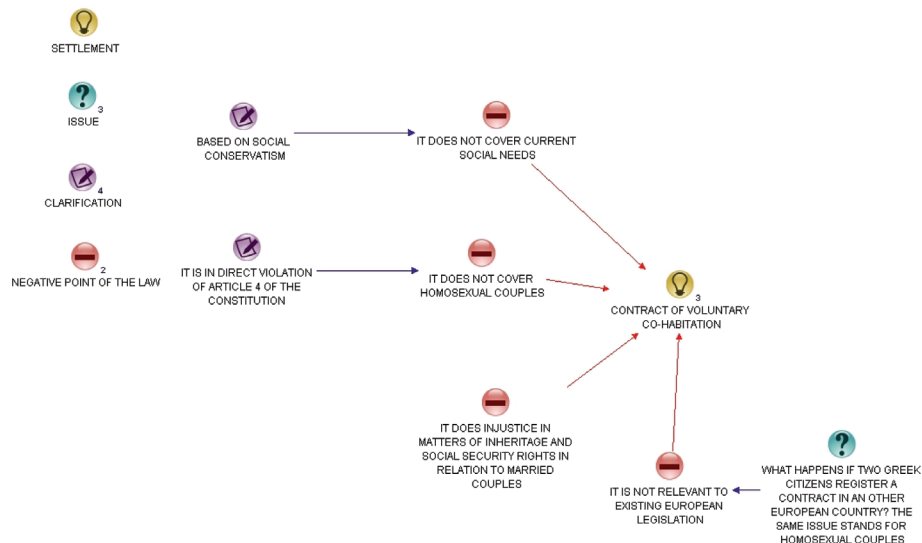
Figure 7. Visualization of the position of another political party
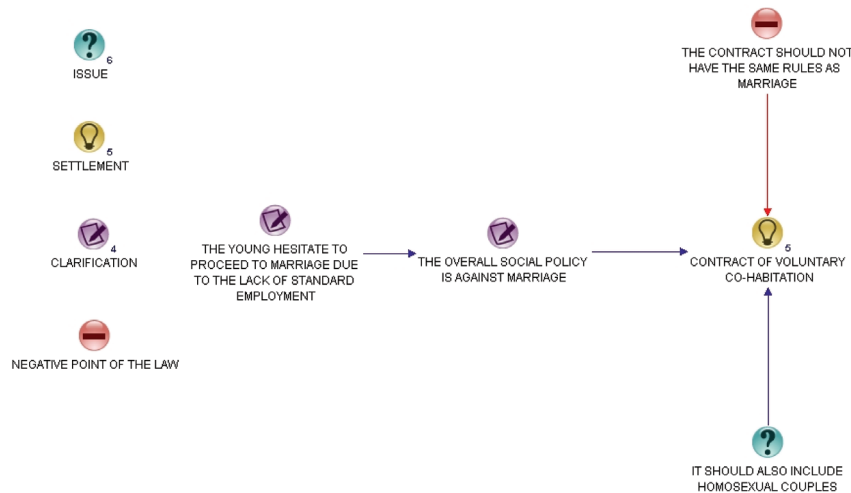
(adapted as 'negative point' nodes), note/information nodes (adapted as 'clarification' nodes), and one question node (adapted as 'issue' node). We can see that this political party mentioned four main weaknesses of this bill, and for two of them added further clarifications; also they raised one issue associated with one of these weaknesses.

In Figure 7 we can see the visualization of the position of another political party on this bill. From a quick comparative look at the visualiza-

Figure 8. Synthetic visualization of the strengths, weaknesses and suggestions mentioned for this bill by parties, experts and stakeholders' representatives
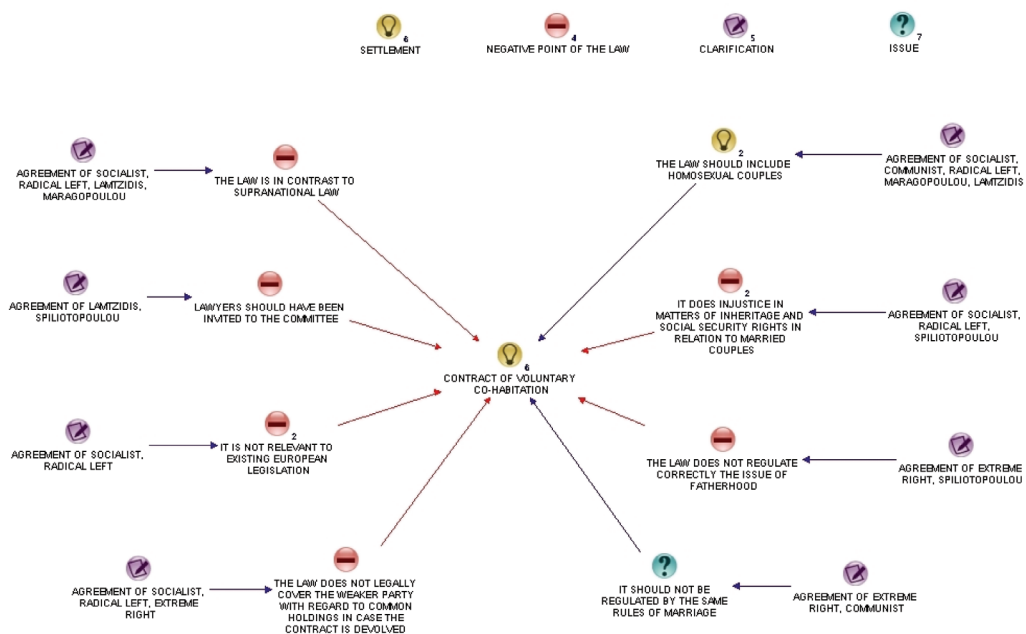
tions of Figures 6 and 7 we can immediately understand that the first party finds more weaknesses in this bill than the second, and that they have different focuses (e.g. the first party focuses on the lack compatibility of this bill with corresponding laws of other European countries and its practical implications, while the second focuses on the need in the co-habitation contracts to have different rules than in the traditional marriage); however, we can see that they agree on the necessity to cover in this bill the co-habitation of homosexual couples as well.

Finally, in Figure 8 we can see a synthetic visualization of all strengths, weaknesses and suggestions mentioned by the main speakers of political parties, the experts and the representatives of stakeholders for this bill. Its nodes have been arranged in 'co-centric circles'. In the middle of the map the bill has been modelled as a basic settlement node, and around it in the first inner circle have been placed six negative point nodes representing the main weaknesses mentioned; also, has been placed one settlement node representing the suggestion of some the parties, experts and stakeholder representatives to include homosexual couples as well, and an issue mode. In the second outer circle we have added for each of the inner circle nodes a clarification node showing who agrees on this particular point.

EVALUATION

The above pilot application of the proposed approach to the use of CSAV in the legislative process has been evaluated through a qualitative in-depth discussion of about four hours duration, held in a focus-group, consisting of four participants in this pilot e-consultation, a legal expert, a lawyer assistant to the member of the Parliament who was the main speaker of the governing party for the bill, and one official of the parliament. The evaluation was based on an established and mature foundation, the Technology Acceptance

Model (TAM) (Davis, Bagozzi, & Warshaw, 1989; Davis, 1989), which has been widely used as a basis for the evaluation of various types of information systems. According to the TAM, the main determinants of the attitude towards using an information system of its potential or real users are:

- its perceived ease of use (PEU), defined as the extent to which users believe that using the system will be free of effort,
- its perceived usefulness (PU), defined as the extent to which users believe that using this IS will enhance their performance in a particular task.

Therefore in this in-depth discussion the main topics were the ease of use and the usefulness of the visualizations, and also possible improvements. With respect to the former, all the persons who participated in this discussion accepted that the visualizations were understandable to a rather good extent, after some initial time period required for getting familiar with the symbols of the nodes. However, it was mentioned that they would be easier to understand if all of them were read in the same direction (e.g. from left to right, harmonized with the direction of reading books), which should be clearly indicated. With respect to the usefulness, it was mentioned that the main advantages of visualizations are the time efficiencies created for the participants in such e-consultations, who usually do not have the time to go through all the lengthy relevant textual documents. It was also mentioned that the visualizations of the positions of the parties helped them to 'filter-out' the excessive rhetoric and the irrelevant or generic comments (not directly related to the bill under discussion), which are quite usual in such political speeches, and focus on the main points raised by them and also understand better their stance in the final balloting on the bill. The visualizations of the opinions of the experts and the positions of the parties were more understandable and useful (since the corresponding textual documents were quite

lengthy), than the visualisations of the content (articles) of the bill and its justification report.

A major weakness of the visualizations of the articles of the bill was mentioned by the legal expert involved in this focus-group discussion. In particular, she argued that in the visualizations of the articles all the different types of settlements included were represented by a single type of node ('settlement node'); she added that this is not acceptable, since there are quite different kinds of legal rules, such as prohibitive, imperative, permitting and presumptions (Georgiadis, 1997; Lingeropoulos, 2002), which should be represented by different types of nodes. Also, in these visualizations of the articles the sequence of reading these 'settlement' nodes should be indicated, and follow their sequence of the corresponding settlements in the text of the bill, since some of them were associated with previous ones.

AN EXTENSION OF IBIS FRAMEWORK

Based on the conclusions of the evaluation we proceeded to an improvement of our approach to the visualization of the bills' articles. In particular, we enriched the typology of nodes provided by the IBIS framework and the Compendium tool, by refining the 'settlement' type, taking into account the classification of rules proposed by jurisprudence (Georgiadis, 1997; Lingeropoulos, 2002), into the following five types:

a) **Prohibitive Rule**: They are rules imposing to abstain from a particular behavior or excluding a particular outcome. Such prohibitions are often accompanied with sanctions in the case of violation (e.g. invalidity, forfeiture of a right, obligation of reimbursement). These rules are usually expressed using the verb "prohibit". For instance, a minor is prohibited, without the consent of his/her guardian, to acknowledge the obligation or expropriation of his/her property.

b) **Imperative Rule:** They are rules which impose a positive behaviour. These rules are usually expressed using the verbs "owes to", or "has to", or "must", etc. For instance, the banks have to report some types of transactions (e.g. ones for which there is a suspicion of association with fraudulent activities) to the Ministry of Finance.

c) **Permitting Rule:** They are rules which recognize to a person a certain authority or permit to it a certain action. These rules are usually expressed using the verbs "can", or "has a right to", etc. For instance, a minor who has completed his 14th year of age can dispose, without the consent of his/her guardian, everything that he/she gains from his/her work.

d) **Legal Presumption:** These are the outcomes which the law defines that should be initially deduced as far as unknown incidents are concerned, from other known ones, in order to facilitate the judge to find out the truth or the untruth of litigants' pleas, for which finding evidence is impossible or very difficult. For instance, a child who took birth during the marriage of his parents is initially presumed that has got for father the man to whom his mother is married to (except evidence for the opposite is presented).

e) **Settlement:** With this type will be modeled rules defined in bills' articles, which do not belong to any of the above four types

In Figure 9 we can see the new visualization of the content of the seventh article of this bill using the above enriched typology of nodes (its initial visualization appears in Figure 4).

CONCLUSION

In the previous sections has been described a comprehensive approach to the use of CSAV in the legislation formation process, aiming to support and enhance e-participation in it. This approach

Figure 9. New visualization of the content of the 7th article of the bill
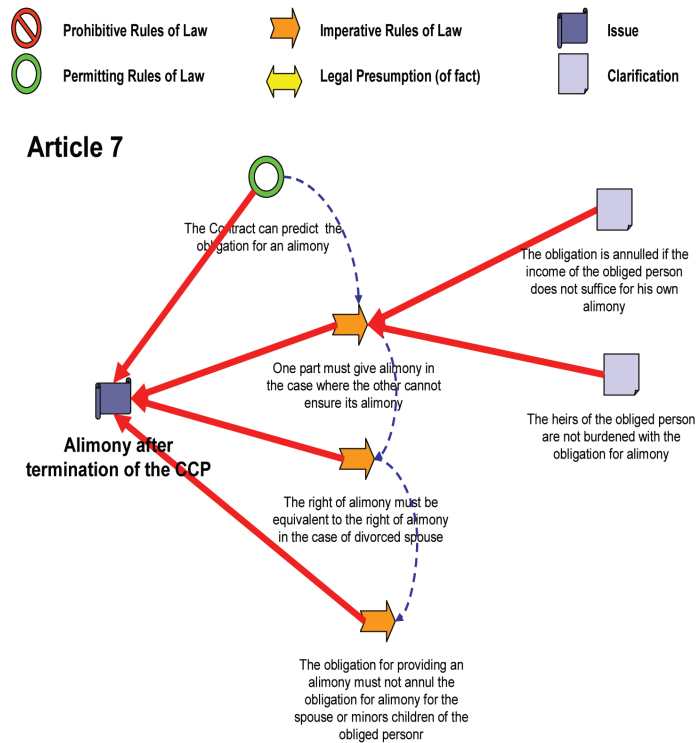
has been designed based on a careful and detailed analysis of this process, its stages and documents. This analysis revealed that the legislation formation process includes some fundamental stages, which are strictly defined by law, producing some fundamental documents. Therefore in order to give to the citizens and civil society groups interested to participate in the formation of a bill a complete picture of it, it is necessary to provide them a set of visualizations, including both i) 'individual' visualizations of these fundamental documents (justification report, main content of the bill (articles), position of each of the experts and stakeholders' representatives invited in the competent Parliamentary committee, position of each political party), and also ii) synthetic visualizations, combining information from several fundamental documents of parts of them (e.g. showing all strengths, weaknesses and suggestions mentioned by the stakeholders' representatives and experts invited in the competent Parliamentary committee, or by the main speakers of the political parties). This was the base of our approach. Also, for these visualizations we decided to use initially the IBIS framework for representing wicked problems, as it is well established and mature, and at the same time provides a simple, understandable and powerful typology of nodes, which have been proved to be sufficient for the representation of wicked problems in various domains, including politics.

A pilot application of this approach has been conducted, as part of a pilot e-participation project in the Greek Parliament, concerning the bill on the 'Contract of Voluntary Cohabitation. This application has been evaluated through a qualitative in-depth discussion in focus-group based on the 'Technology Acceptance Model' (TAM). From this evaluation it has been concluded that these visualizations are understandable to a rather good extent, after some initial time period required for familiarization. Also, it has been concluded that

they are useful, as they can significantly help citizens to understand more easily and quickly the content of the fundamental documents of the legislation formation process, enabling a more meaningful and effective participation in it. However, the IBIS framework was found to be insufficient for the representation of the different types of settlements that the articles of a bill include; for this reason an enrichment of this framework was developed, based on the classification of rules according to the jurisprudence, which improves the visualization of the main content of bills and laws.

Our findings provide a first evidence of a good potential of using CSAV in the legislation formation process for supporting and enhancing public participation in it (both off-line and online). Appropriate use of CSAV can make the complex political debate on new legislation more understandable by the citizens and the civil society, and therefore increase the quantity and quality of their participation; it can contribute to countering the observed trend towards an 'elitist model' of democracy, in which managers and experts have the main role in addressing the complex social problems and needs and public participation is limited. Therefore CSAV can have a positive impact on the 'public sphere', both in the traditional and 'virtual' sense (i.e. based on ICT and Internet), in all the three 'institutional criteria' suggested in the relevant analysis of Habermas (1962): inclusivity, disregard of status and common concern. The use of such technological tools can make the political debate more inclusive, so that more citizens (of various educational or knowledge levels and statuses) can express their opinions and concerns. Further research is required towards exploring and exploiting this potential of CSAV, in different stages of the lifecycle of public policies, programs and legislation, for different purposes, audiences and cultures.

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