

Concept for a Collaborative Moderation System

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Abstract: *The present paper aims to construct a mechanism for automatic moderation of consensus in a collaborative environment. The first step towards this goal is identifying atomic issues and solutions, which will then be used to construct a network of interdependent compromises.*

Keywords: *consensus moderation, collaborative consensus.*

1. Introduction

The present article is a continuation of the paper “An Approach Toward Open Collaborative Government” [3]. As such, there is a fair amount of quotation from the above mentioned article.

The purpose of the paper is to detail the mechanism presented in the above mentioned paper in order to achieve a working consensus moderation system.

2. Moderation

The principle of consensus moderation is approached as the problem of generating a network of compromises between the actors involved which would allow them to reach a situation considered satisfactory by all parties.

The concept which forms the basis of the idea of moderation is that it is possible that during a negotiation between a large enough number of actors, an optimal solution may exist that is undetectable by the parties themselves. The system would thus come to the aid of those involved by constructing this optimal compromise solution.

By moderation mechanisms we understand the methodology by which the optimal solution is constructed. These mechanisms must cover all the steps necessary, beginning from the decomposition of the problem an ending with the construction of the compromise network.

a. Problems with the construction of consensus

The first problem raised by the construction of consensus is that of the granularity of the discussed issues. It is possible that an issue which seems atomic has to be decomposed in smaller one because a part of the actors involved have different opinions on parts of the issue. An atomic issue is thus an issue on which different opinions may or may not exist, with the property that if there are different opinions they involve the whole issue and not a particular part of it.

The second problem relates to identifying which proposed solutions are made “jocandi causa”, by which we mean proposed approaches which have neither the purpose nor the pos-

sibility of leading to a solution to the issue they refer to. While this is a minor problem in the case of the negotiation between a small set of specialized actors, this becomes important when the mechanism is applied to large groups of people.

It is important to detect which propositions are made with serious intent, firstly in order to leave the discussions unaffected by users whose purpose is to perturb them and secondly in order to have a “clean” set of initial propositions from which to begin the construction of consensus. A proposition will be considered as unserious if a sufficient number of users have marked it as such by giving it a “thumbs down” (effectively expressing their intention to veto it if it is possible).

In order to avoid unjustified marking of a proposition, the number of vetoes necessary for a proposition to be rejected should be dependent on the proposition history of the proposer. This would allow the system to avoid users blocking proposals due to their content and not their intent. A possible formula that can be used in order to calculate user prestige is presented below:

$$C = \frac{1}{T} \sum_{i=1}^n v_i ,$$

where C , the credibility of the user is the sum of the vetoes for each previous proposition divided by the total number of votes, T .

b. Decomposing issues

The first step in creating a system of automatic consensus moderation is decomposing the proposals submitted by the users. By their definition, the initial proposals form a single issue; they are then decomposed by the system in partial issues, identified via the interactions of the users.

A partial issue is defined through the fact that it creates discussion. If a subset of an issue creates discussion between the users, it must be decomposed into partial issues, which will in turn be considered atomic. It must be mentioned that the attitude of the users towards the particular issue can be irrelevant, while their interest in the issue is not. At this point we are trying to identify which matters the users consider important, as it is on these that the network of compromises should be constructed.

The mechanism for adding and decomposing issues is presented in the figure below.

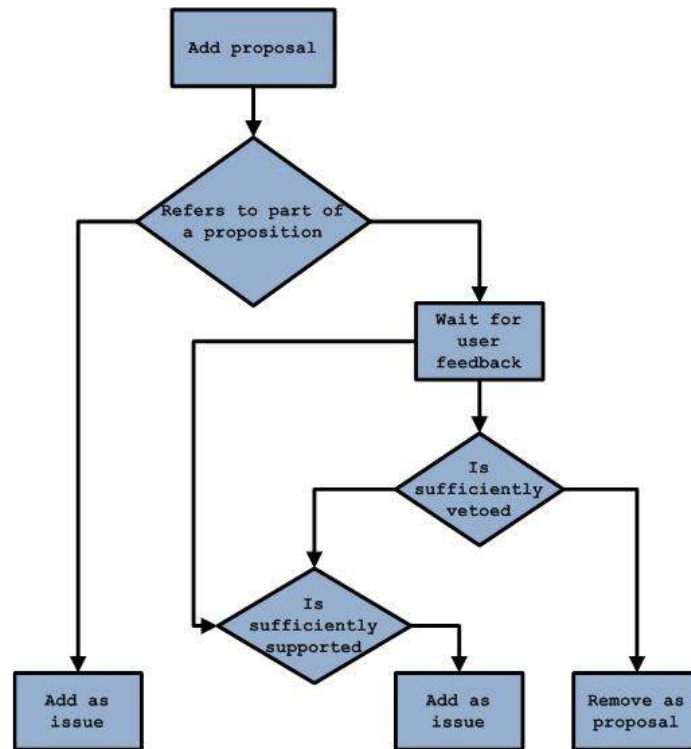


Fig. 1. Decomposing proposals

As shown in the figure, only serious partial issues are considered relevant, with the rest being removed via the veto mechanism. Also, although not represented in the figure, an additional mechanism must exist, which should remove those issues which have not reached consensus and are no longer interesting to the users.

c. Identifying partial solutions

Another element in constructing a consensus moderation system is identifying proposed solutions to the problems. On one hand, the system must identify which of the proposals tend to lead to a possible solution, on the other hand, the system must identify what part of the problem the solution refers to. The granularization of the problems and the solutions is important because the atomic problems and solutions form the basis for a network of compromises which will lead to an acceptable outcome for the actors involved.

If a proposal leads to a solution to a part of the problem discussed, then the problem itself has to be split in partial problems, provided that the proposed solution is considered relevant. The mechanism for this is presented in the figure below:

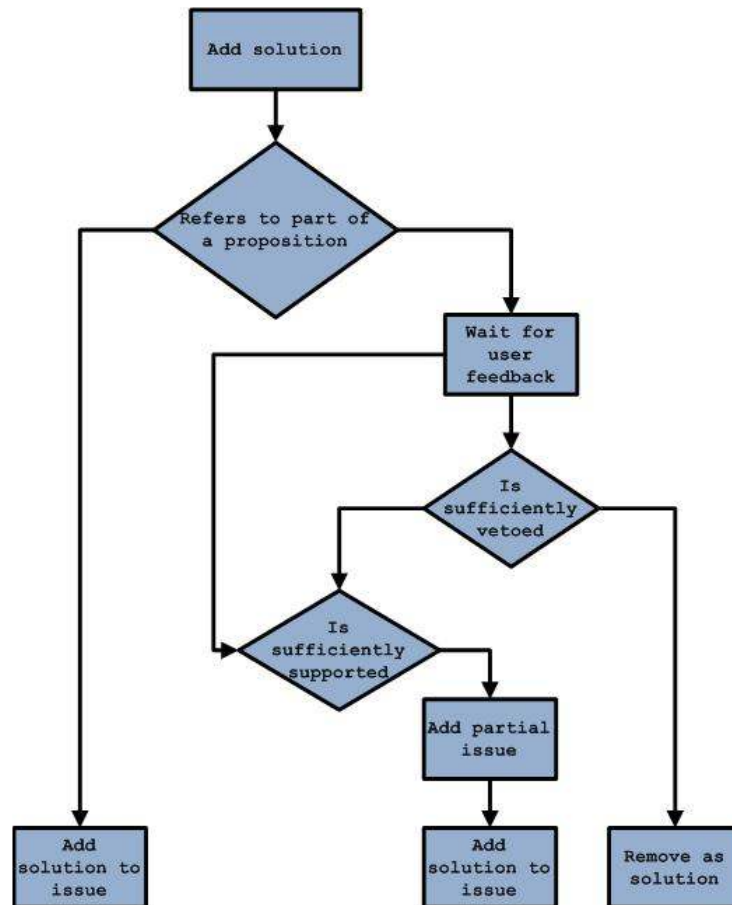


Fig. 2. Decomposing solutions

d. Constructing partial compromises

By constructing partial compromises we understand identifying the connections between the attitudes of the actors relative to the problems discussed and proposing a solution which the actors are likely to find acceptable.

The proposed solution is not one for a particular atomic problem, as the system should never attempt to know what the actors *should* think about a particular thing, but rather to a set of problems, where the actors could agree on their own through a set of reciprocal concessions. For example, given the problems X and Y to which two groups A and B have different attitudes, the system might propose to group A to accept X in order to gain the cooperation of group B on the Y issue. Two possible proposals are possible A could renounce X while B renounces Y or A could accept Y while B accepts X. The actual proposal should take into account which of the two is more likely to be accepted. The mechanism for a simple compromise is presented in the figure below:

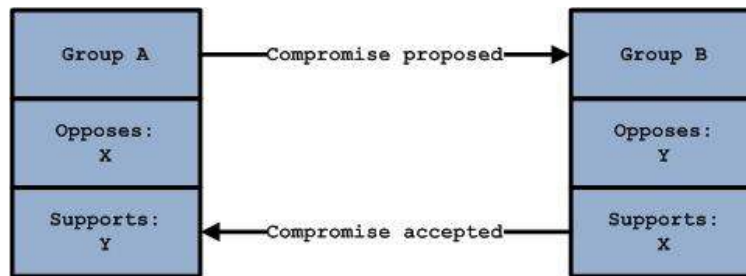


Fig. 3. Simple compromise

The result of the compromise is the restructuring of the groups as below, with the possible consequence of consensus being reached, in the event that all the groups involved in the discussion are members to the compromise.

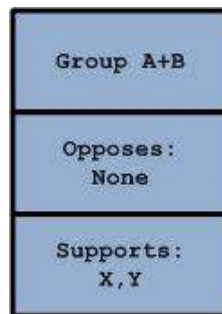


Fig. 4. Situation after the compromise

In a real case, the compromises would be much more complex, since it is improbable that a large group would agree on two issues as in the above example. The system must be thus ready to offer a custom set of compromises to each actor. Compromises would be continuously presented until an acceptable one is reached.

The way a network of compromises can be identified relies on a set of optimization methods, be it genetic algorithms or another method. The specific solution will be presented in a future article.

One possible method is to try to predict the future behavior of a user, identifying which compromises would have the highest chance of being accepted. The basis of such a solution is presented in a previous article [1] [2].

The system has to integrate all the steps described above along classical collaborative mechanisms which would allow for effective communication between the actors involved. The actions of the users will be logged by the system as a means of determining the future behavior of the users.

3. Conclusions

Testing the system should ideally be done on a sufficiently large number of citizens. However, in an initial phase, testing would be done on a smaller number of actors simulating simpler case of negotiation between important actors in a particular field.

The propositions constructed via a consensus moderation mechanism have the advantage of representing all the users involved as opposed to the majority of the users, thus having more legitimacy towards the population of actors.

References

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Andrei TOMA has a background in both computer science and law and is interested in an interdisciplinary approach to IT Law related issues. He has graduated the Faculty of Cybernetics of the Academy of Economic Studies in Bucharest and the Faculty of Law of the University of Bucharest. He is currently conducting doctoral research at the Academy of Economic Studies. His fields of interest include IT Law related issues, as well as various artificial intelligence topics.