APOPSIS: A Web-based Platform for the Analysis of Structured Dialogues

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ABSTRACT

Social networks are constantly evolving to support the increasing needs for knowledge sharing, interaction and collaboration among people through Web. However, the need to understand and analyze the opinions expressed in dialogues increases rapidly because of the dynamic nature of debates and the large number of comments they contain. To address these issues, we propose a debating platform that aims to analyze users-generated opinions, using different metrics and motivate people to participate in structured, goal-oriented dialogues by expressing their views in the form of arguments. The overall objective is to offer different means of analysis of the dialogue, in order for the participants to obtain a complete picture of the validity and justification strength of each individual opinion expressed, as well as of the acceptance of the positions issued within each debate.

1 INTRODUCTION

More and more opinions are presented every day on the Web, where users express their opinions and share their experiences on discussion forums and debate portals as well. The dialogues encountered on the Web, often hide very interesting facts and opinions. However, in most cases, debates are unstructured, meaningless and often chaotic, especially the dialogues on topics of general interest as there reflected public opinion.

Several software systems are developed for facilitating structured dialogues and mostly to serve the need of quering, searching and evaluating arguments in an informative and interactive way. These systems provide a collection of differing views where users can support their stance by stating arguments in support of or against a statement. Despite the fact that they provide structured dialogues, none of these systems is able to analyze opinions in order to assist decision makers in understanding the dynamics of communities.

To the best of our knowledge, this work is the first study that focuses on providing different means of opinion analysis, considering both well-justified arguments and user profile characteristics throughout the decision-making process. The purpose of our system, Apopsis, is not to provide a debate outcome for decision-making problems or a response of yes or no. Indeed, the system identifies and extract the most relevant opinions prevailing in discussions.

The system supports a range of functionalities, the most important of which include 1) A semantic representation of discussions that stores opinions in the form of RDF statements, 2) An existing formal framework for evaluating the strength value of each argument and 3) A combination of machine learning algorithms for the opinion analysis, including clustering and associations rules algorithms.

2 APPROACH

Apopsis is a web-based debating platform that supports argumentative discussions and help desicion makers to understand the dynamic of communities in order to obtain a complete picture of the validity and the acceptance of each individual opinion expressed in dialogues.

In this work, debates proceed in two different stages, which are facilitated by a class of users, known as moderators, ensuring the high and quality analysis of opinions. In the system, discussions are modelled and presented as trees according to an argument mapping schema, based on IBIS model. However, a semantic representation (RDF ontology) of dicussions is needed, for the purpose of storing and retrieving the opinions in the form of RDF-triples into the Virtuoso repository. Based on users arguments, the system applies an existing formal framework, called sm-Dice, for evaluating the strength value of each argument using different metrics. The main contribution of this work constitutes the debate analysis, where discussions are estimated with the help of ML algorithms, for the clustering of features and the extraction of association rules, such as the Kmeans, Expectation-Maximization and Apriori algorithms, implemented in WEKA[1]. The proposed analysis covers six different information needs emerging from users and is focusing on users-generated arguments and users profile characteristics throughout the decision-making process.

3 CONCLUSION

To conclude, we designed and implemented a web-based debating platform, called Apopsis, with the goal of offering different means of opinions analysis and enabling users to express their opinions in deliberation processes according to a goal-oriented topic of discussion. Among all systems we examined, Apopsis applies a more reliable method for evaluating the strength value of opinions and mostly, addresses the problem of unstructered and chaotic dialogues on the Web by identifying and monitoring the most relevant opinions expressed in discussions, using clustering and associations rules algorithms.

[1] www.cs.waikato.ac.nz/ml/weka/