Empowering Public Interest Communication with Argumentation - Project Overview

Pietro Baroni[1], Stefano Bistarelli[2], Bettina Fazzinga[3], Giulio Fellin[1], Sergio Flesca[4], Filippo Furfaro[4], Massimiliano Giacomin[1], Francesco Parisi[4], Carlo Proietti[5], Irene Russo[5], Francesco Santini[2], Carlo Taticchi[2] and Paola Vernillo[5]

[1]*DII - Universitá di Brescia*
[2]*DMI - Universitá di Perugia*
[3]*DICES - Universitá della Calabria*
[4]*DIMES - Universitá della Calabria*
[5]*ILC - Consiglio Nazionale delle Ricerche*

Abstract

The EPICA (Empowering Public Interest Communication with Argumentation) project aims to improve Public Interest Communication (PIC) through the use of advanced Computational Argumentation (CA) techniques. The project's activities include exploring the potential of CA to address specific PIC needs, developing formal models for effective communication, and applying them to real case studies for validation. It also focuses on developing reasoning algorithms and innovative tools to support PIC strategies, enable the dissemination and practical application of the results, and improve institutional communication practices to address critical societal challenges.

Keywords

Computational Argumentation, Public Interest Communications, Argumentation Dynamics, Automated Reasoning

1. Introduction

In an era where digital communication rapidly shapes public opinion and social discourse, it is of paramount importance to ensure the effectiveness of Public Interest Communication (PIC) [1]. Institutions and organizations often use PIC as a means of addressing significant societal challenges, ranging from health crises to environmental issues. As communication strategies become increasingly complex and ubiquitous, it is imperative to harness advanced methodologies to improve their impact. The EPICA project (Empowering Public Interest Communication with Argumentation) aims to integrate Computational Argumentation (CA) [2, 3] techniques into PIC strategies with the goal of providing innovative insights and tools to refine institutional communication practices. This ongoing project will contribute to the advancement of theoretical knowledge and the production of practical solutions that can be applied to real-world communication scenarios.

In particular, EPICA focuses on the central questions of how and to what extent CA can empower PIC, which entails a number of key sub-questions:

1. What specific needs within institutional PIC could CA address, and which might require novel advancements beyond state-of-the-art techniques?
2. How could CA formalisms be extended to effectively model and analyze essential elements of institutional PIC?
3. What methods could be employed to extract relevant information from actual PIC case studies to apply the developed CA models, and how can we verify that these models meet the criteria for effective communication?
4. What algorithms are necessary to implement these models and what innovative software tools could be developed?

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Therefore, the project activities have been organized in such a way as to address the research questions listed above, with particular attention to the dissemination of the results achieved.

2. Project Description

The project is structured into five key activities, each of which is designed to build on the previous one. The first activity, completed in June 2024, involved an in-depth **conceptual analysis** with the aim of identifying and defining the requirements of an effective PIC from an argumentation perspective. This involved an examination of existing PIC case studies to understand the needs and challenges faced by institutional actors. The knowledge gained was the basis to outline the specific characteristics and capabilities that CA models must possess to effectively support and improve PIC efforts.

In this first phase, we analysed Web-based initiatives promoting fruit and vegetable consumption, selecting those representing the different agencies that can launch a green diet communication campaign and the different ways in which it can be implemented. Our goal is to examine the arguments used and their distinguishing characteristics. We explored various aspects, such as the values conveyed, the use of structured argumentation schemes, presentation styles, and argument sources. Additionally, we investigated relationships beyond the attack/support dynamic, identifying subgoal, specialization, and expansion. Finally, we considered how the temporal dimension influences argument relevance and effectiveness in a campaign. As a result of the initial phase, a preliminary pipeline for analysing the arguments was established, and a list of modelling requirements addressing the abovementioned aspects was developed.

In light of the requirements identified in the first activity, the second activity focuses on the development of **formal argumentation models** that could be adapted to PIC. These models will address crucial aspects of PIC, such as coherence, persuasiveness, and the ability to manage long-term communication strategies. The formal models will provide a theoretical basis that can be used to analyze and improve PIC campaigns in a more systematic way.

The third activity consists in **applying the developed models** to real-world PIC instances to **test their validity and effectiveness**. This phase involves identifying test cases consisting of publicly available institutional PIC instances. The aim is to link natural language sources with formal models, employing both automated and manual annotation techniques to extract relevant information. This will result in the creation of a targeted dataset that could serve as a benchmark for the evaluation of the models. The feedback from these evaluations will be used to refine and adapt the models if necessary.

The fourth activity involves the **development of reasoning algorithms** based on the formal models obtained in the previous phases. These algorithms will automate the generation of argumentative footprints and provide formal representations of communication traces, thus making them adaptable for computer analysis and visualization. The project will take advantage of existing CA tools and techniques, adapting them to the specific needs of PIC. The developed algorithms will form the basis for research-level test tools, which will be tested with a selected group of stakeholders to gather feedbacks and identify areas for further improvement.

The final activity is conducted alongside the other ongoing initiatives to facilitate the communication of **project results** and to ensure their impact extends beyond the academic community. This entails disseminating results through publications, conferences and workshops and involving potential users and stakeholders. The project will also explore the possibilities of exploiting the tools and techniques developed to integrate them into existing platforms used by public and private institutions to manage social networks and other PIC-related activities.

3. Possible Applications and Impact

EPICA is a research initiative that explores how CA can improve PICs by developing new models and algorithms tailored to the specific needs of argumentative discourse. EPICA aims to make substantial contributions to the theoretical and practical aspects of PIC argumentation by addressing the gaps in

current CA methods. The project aims to significantly advance the field of CA by producing state-of-the-art tools that reveal new possibilities for the design, analysis, and management of PIC campaigns.

EPICA is also expected to have a considerable impact at the societal level. The project aims to improve the effectiveness of PIC campaigns, which is particularly important for addressing pressing societal challenges such as public health crises, environmental issues, and social policy debates. The improved communication strategies facilitated by EPICA will promote a more informed public discourse, thus increasing public trust and engagement.

Acknowledgments

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