MAPPING COMPLEX DEBATES: A CASE STUDY ON AUSTHINK RATIONALE

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ABSTRACT: *Argumentation is considered the most important way humans can deal with conflicting information (Besnard & Hunter, 2008) by finding and organizing justifications for proposed claims. Argumentation is widely used in several domains such as law, politics and management (as decision support). Consequently, for any domain in which a structured argument may be developed, a computer system may be used to aid the process (eg. by storing facts, automatically evaluating arguments or visually representing argument maps). The current paper presents a case study on creating argument visualizations (argument maps) for complex arguments, using the Austhink Rationale software.*

KEY WORDS: *argumentation, computer systems, learning.*

JEL CLASSIFICATION: *D83, L86.*

1. ELEMENTS OF ARGUMENTATION

1.1. Basic concepts

Argumentation is a complex domain with various concepts that may be defined and interpreted in different ways. A few short definitions are provided below to some of the more basic yet defining concepts of argumentation.

An argument is defined as "a sequence of statements such that some of them (the premises) purport to give reasons to accept another of them, the conclusion"." (The Cambridge Dictionary of Philosophy)

The **premises** are assumptions that are usually proposed as true and serve as reasons to trust the conclusion.

A **counterargument** may be either a rebutting argument or an undercutting argument. An argument A2 is a rebutting argument for A1 if the conclusion proposed

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by A2 is the negation of the conclusion proposed by A1. A2 is an undercutting argument for A1 if its conclusion is the negation of one of the premises of A1. (Besnard & Hunter, 2008)

An **argument map** "is a diagram that captures the logical structure of a simple or complex argument" (Lau & Chan, 2004), or, more simply put – a graphical visualization of the structure of an argument.

The model proposed by Toulmin, S. (2003) introduces some new elements of practical argumentation. Howeverm this model is not directly implemented in the *Austhink Rationale* software and is therefore outside the scope of the current paper.

1.2. Types of argumentation

Argumentation may be classified using various criteria such as *argumentation objective* or *conversation type*.

Considering the argumentation objective, the two most used types of argumentation are *completion argumentation* and *collaboration argumentation.* Argumentation is competitive when it is backed by the desire to persuade a public or an opponent of a certain conclusion or set of conclusions (Andriessen, 2006). Argumentation is collaborative when it is backed by a desire to explore a problem domain using different (opposing views) and search for the best solution in an argumentative setting (Nonnon, 1996). Some authors, e.g. Besnard and Hunter (2008), propose other possible objectives of argumentation such as *information* (informing the audience about some verifiable information) and *positional argumentation* (informing the audience about the speaker's position on an issue).

Considering the conversation, there are two types of argumentation: *monological* (in which there is only one speaker that presents his argument) and *dialogical* (in which there are two or more speakers that develop their arguments and rebut the arguments of others).

The current paper provides a study on a dialogical, competitive argument, developed by the interaction of two speakers, as presented in section 2.2.

2. MAPPING COMPLEX DEBATES IN "RATIONALE"

2.1. Rationale overview

Austhink Rationale is an argument mapping software with desktop and online versions. More specifically, it is a *graph-based system*, i.e. a system that displays claims, premises and data as boxes or nodes and the relations between them as edges (or arrows) (Scheuer et al., 2010).

Rationale has allows the creation of three types of maps: grouping maps, reasoning maps and advanced reasoning maps.

- **Grouping maps** are the most basic; they can be used to represent any top-down graph with different colour boxes with no role.
- **Reasoning maps** provide three types of boxes: *contention*: used to specify the conclusion or claim; *reason*: a premise (or a group of premises) used to

support the conclusion or another reason; *objection*: a conclusion, premise or group of premises used to contradict a reason or a contention.

- **Advanced reasoning maps** provide the same boxes as reasoning maps and a *co-premise* box. The contention, reason and objection boxes may hold more than one premises, making a clear distinction between "premise" and "reason". This allows developing more clear maps (e.g. by explicitly adding implied co-premises) and also allows the representation of both rebutting and undercutting arguments: the first is shown as an objection to a conclusion, reason or objection and the second is displayed as an objection to a specific co-premise of a reason or objection.

Since container maps are simple and less relevant, Figure 1 shows a simple argument structure represented in a simple and an advanced map.

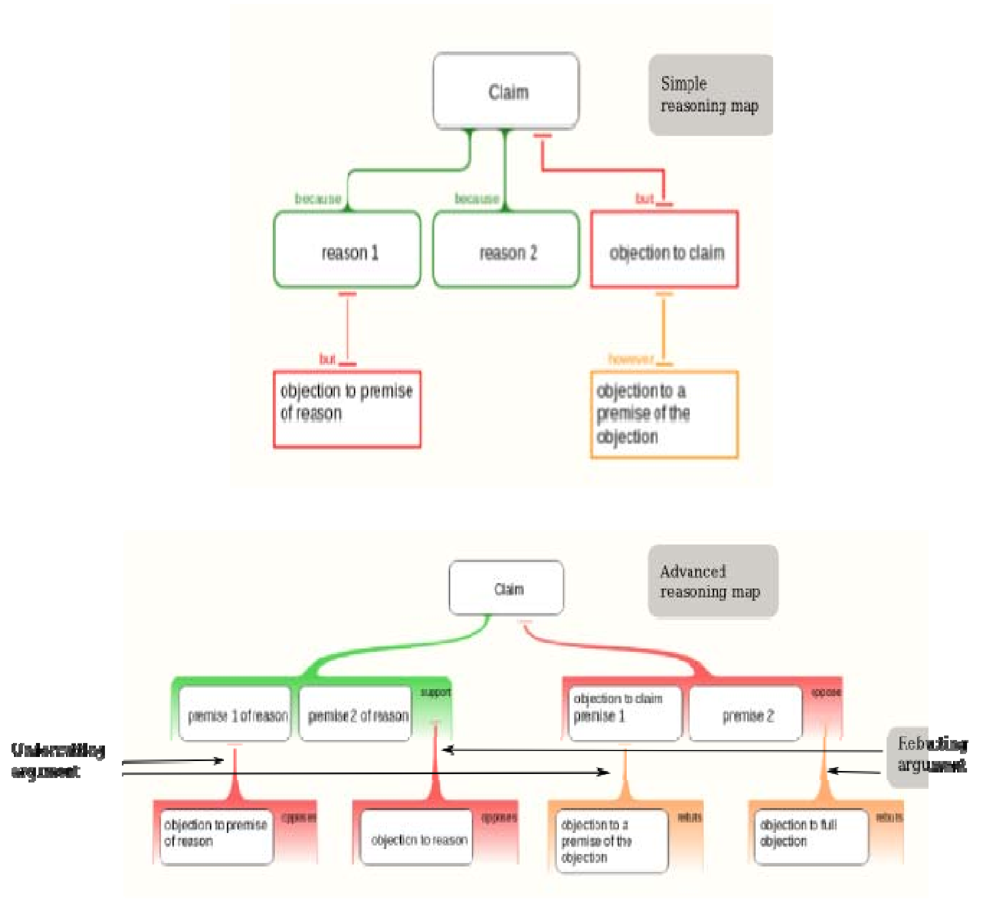

Figure 1. Simple and advanced reasoning maps in Rationale

2.3. Some findings

To better test the system, a more complex text has been chosen: a transcript of the debate on the benefits of religion, between Christofer Hitchens and Tony Blair. (hitchensdebates, 2010).

The selected text is a natural-language expression of several arguments that create a hierarchy pointing to the main argument (that "Religion is not a force for good in the world"). The hierarchy is expected, since each reason (or objection) for any claim may have supporting reasons (or objection) itself, thus turning it into a simpler, lower-lever argument.

To represent the text, it had to be first prepared, so that most figures of speech have been disregarded, focus has been put on claims (for each argument, including low-lever ones) and on the reasons for each claim. Thus the text has been changed as shown in figure 2:

Argument no. 5

Premises:

1. Religion supports political power even when that political power doesn't uphold human rights.

Proof: The Russian Church openly supports the Russian Government, which is an increasingly xenophobic, tyrannical, expansionist, and aggressive regime.

2. Religion promotes ideas that put people at risk.

Proof: In Africa, the Church teaches that "AIDS may be wicked but not as wicked as condoms"

Conclusion: Religion has a detrimental effect on society.

Figure 2. Argument preparation

The basic tools and methods for map creation are pretty straight-forward. Even though the major terms used ("contention", "reason" and "objection") are different from what we would find in argumentation theory, they are quite clear and practical.

Both the *reasoning mode* and the *advanced readosoning mode* allow boxes to be placed either downward, either side-by-side, with connections being constructed automatically as needed. The lack of manual connections between boxes may be seen as a trade-off between complexity and clarity: while in some cases a manual connection would have been useful, it is clear that such an option would influence other features of the software, such as the automatic structuring of boxes.

Rationale maintains a structured map by automatically pushing existing boxes apart to make room for new boxes. The only options available to map creators are *resizing* of boxes and *placing* or moving them (to connect them to some other boxes, or disconnect them). This limitation might frustrate some users used to more flexibility, but it ensures maps will be consistent and organized. One noticeable feature in this sense is the organization on levels – adding boxes on the vertical axes tends to place them on the same level (connections are fixed and cannot be resized). This is unfortunately hindered by boxes with a large amount of text, since parallel connection

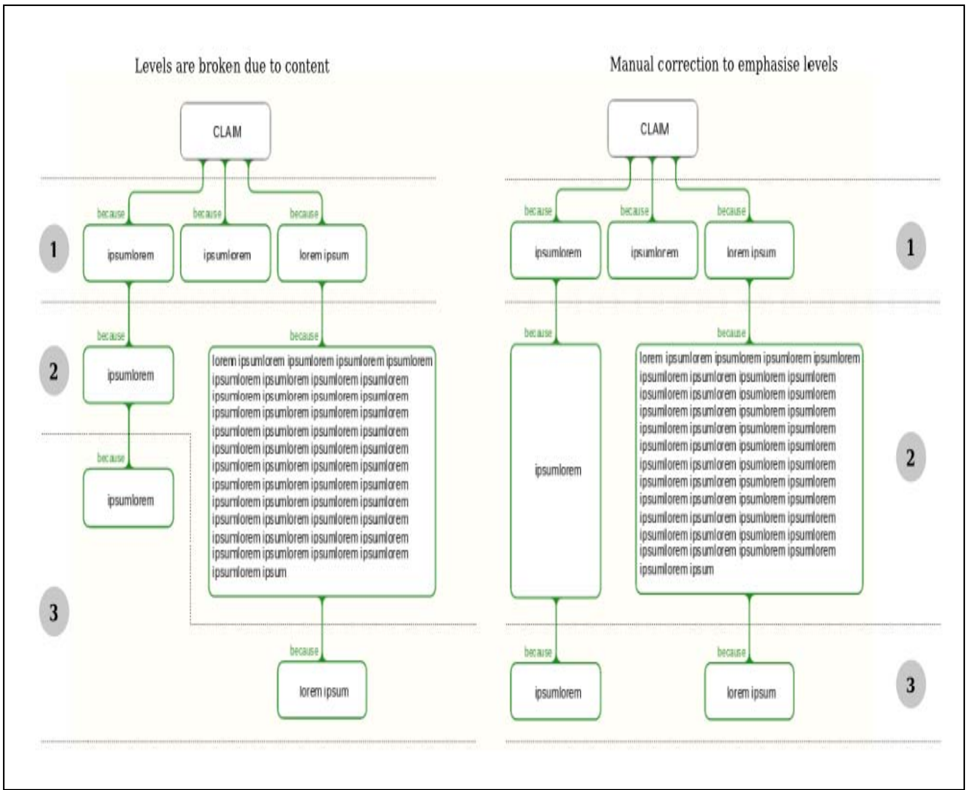

Figure 3. Structuring arguments with levels

will not be resized and the levels will not be visible anymore and it has to be manually corrected by vertically resizing boxes (see Figure 3).

Another downside of automatic positioning of boxes is that complex argument maps get very large really quickly. The complete map of the chosen text got to a width of 6 pages A4 (landscape) and needed three such rows in height. This would be hard to display in printed form and even poses difficulties for viewing as is, in digital format. For reasoning maps this issue may be solved by rotating the map by 90 degrees, making it spread vertically instead of horizontally. This is unfortunately not possible for the advanced maps, that are necessary since they offer the essential functionality of co-premises (which in turn allows both undercutting and rebutting, as described in section 3.1).

Regarding the *evaluation* features, these only offer some extra visualization tools, allowing the emphasis or de-emphasis of boxes, in correlation with the developer's opinion on the strength of a reason or objection. Map creators may thus mark reason or objection boxes as *strong, weak,* or *nill*, while the main claim (as well as the co-premises from the advanced maps) may be marked A*ccepted, Hmmm* (which means “take no stand”) or *Rejected.* This is a useful tool for visualization, yet some automation might be useful as well. For example, if all the reasons supporting a claim are marked strong, the claim should automatically be marked *accepted*. Likewise, if all the co-premises of a reason (in the advanced maps) are marked *rejected*, the reason may be automatically marked as *nill*. This could also be propagated from lower levels to higher levels, making map analysis easier and the evaluation more correct.

The last missing feature is the possibility to number the reasons, objection and premises. This feature is needed in the creation of the large maps mainly for two reasons: first, discussing over such a large map needs a way to point out to an exact reason or premise; second, in a complex debate such as this, some reasons may be repeated to support different claims and some numbering and referring system may make the map more clear.

4. CONCLUSIONS

The current paper presents some findings of a process to visually represent a complex argument, ie. to create an argument map using Austhink Rationale.

The findings include positive aspects such as the clarity of the process and the possibility to represent both undercutting and rebutting arguments. Some negative aspects are also presented. The objects are not numbered, the software does little to aid the user in evaluating maps and the maps get really large really fast, making visualization harder.

Future work would aim to automatize the process of turning an argumentative text into an argument map. These findings will prove useful to bypass some caveats of mapping a large quantity of information.

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