Concept Analysis of Climate Change Agreements

Introduction

This is an exploration of the use of the software application Leximancer to analyze the existing and draft climate change agreements. Leximancer is able to take a substantial body of text and rapidly consolidate it into meaningful 'Themes', 'Concepts' and their associated relationships. These are presented on an interactive map with which various analytical tools are associated. The map may be zoomed to various levels of conceptual detail, with the concepts linked to the texts from which they were derived.

Two texts were analyzed and compared in anticipation of the United Nations Climate Change Conference (Copenhagen, 2009). They were the United Nations Framework Convention on Climate Change and the draft UN's Climate Change Agreement (under discussion for Copenhagen).

Concept analysis and mapping with Leximancer

The application processes text automatically, allowing for subsequent user-controlled exploration, notably with the aid of a dynamically created taxonomy. Salient Concepts are identified, each with an associated Thesaurus of ranked evidence terms in the text. The Concepts are grouped into Themes, allowing the Concepts to be coded via the weight of sufficient evidence terms.

Results of the analysis are presented as a 'Concept Map', which can be readily interrogated at either the Theme, Concept or Thesaurus level, with drill-down capability to the supporting text. The results can be exported in a variety of formats. Concept maps can be exported, notably in JPEG format.

Text input may be provided in a variety of formats in addition to web-crawling features. In the case of the climate change treaty texts, HTML versions were downloaded from the web.

Preliminary maps

<table>
<thead>
<tr>
<th>Comparison of maps of existing and draft agreements (reduced; click images for enlarged versions)</th>
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Automatic comparison report of Existing v. Draft texts

This is an automated Report [PDF] that can be generated using the settings in the Concept Location phase, as follows:

- Set the level of granularity (i.e. number of Concepts required)
- Select the 'Categories' of interest (e.g. Tags)
- Select which 'Concepts' to investigate The Report is in 5 Sections - described below.
The description is based on data that has been 'categorised' ('tagged') in the technology to analyse positive and negative sentiment; however the Report can be produced across any combination of Categories of Concepts.

Section 1: Quadrant Overview: This is a high-level, visual chart displayed in a 'magic quadrant' format. The axes are:

- **Relative Frequency**: a measure of the conditional probability of the Concept, given the Category (in this case positive/negative sentiment) e.g. given we are looking at occurrences of positive (or negative) sentiment, how likely is it that the Concept 'service' is mentioned

- **Strength**: a measure of the conditional probability of the Category (in this case positive/negative sentiment) given the particular Concept e.g. given we are looking at occurrences of the Concept 'service', how often is it mentioned in a positive (or negative) sentiment, i.e. the 'strength' of the association

There are four pertinent areas to the Quadrant; the differing colours of the Concepts denoting their association with the particular Category. Concepts in Quadrant 1 are weak and less prevalent or likely within the Category - a good place for any negative sentiment to manifest. Concepts in Quadrant 4 are strong, prominent and more likely to co-occur with the Category - a good place for positive sentiment to manifest [Given the Category in this description is based on positive/negative sentiment].

Section 2: Ranked Concepts for Categories Overview: This is a more quantitative analysis in ranked barchart format of the most prominent Concepts within the particular Category - defined via a measure of the combination of their strength and frequency characteristics. It also contains hyperlinks to the appropriate reference in Section 4 of the Report - see below.

Section 3: Ranked Compound Concepts for Categories Overview: This is similar to Section 2, providing a ranked list of the most prominent Concept pairs for the Category.

Section 4: Supporting Text Overview: This provides a good supporting text excerpt, and real evidence, for the top related Concepts - for each of the Concepts identified and ranked in Section 2.

Section 5: Ranked Concept Count: This provides the actual ranked list of ALL Concepts and their associated reference count from the original base data.

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