

A language model to investigate the temporal transformation of semantics in the literature on Made in Italy

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Abstract

This study falls within the Made in Italy – Circular and Sustainable (MICS) Extended Partnership, whose vision is “to make Made in Italy (MI) design and production practices circular, self-sufficient, self-regenerative, reliable, safe and sustainable”. The transformation of MI towards circularity and sustainability requires the investigation of what MI is and has been. Since circular and sustainable economy is capturing the attention of MI producers and consumers, we investigate the transformation of the perception of MI by exploring the language of the relevant scientific literature. Experts from various disciplinary areas in the MICS have selected articles and books, which constitute the corpus of text documents, with metadata, subject to analysis. To explore the language of corpus we rely on Natural Language Processing techniques to build language models providing insights into the semantics of words, interpretable by calculations based on word embeddings. However, traditional approaches for word embeddings, such as Word2Vec and GloVe, do not consider any document variable when training the model. Since the focus is on the temporal transformation of the language, we first map the literature on *temporal word embeddings*, and then selected the *Temporal Word Embeddings with a Compass* method as the most appropriate one for our case. Moreover, we collect and formalize interesting tools to explore a temporal language model pivoting around words of interest. Preliminary results suggest that the meaning of words like “circular” and “sustainable”, which was less defined and fuzzy in earlier times, is approaching the definitions assumed in the MICS Project, namely the concepts of circular and sustainable economy.

Keywords: Made in Italy, Circular Economy, Sustainability, Language Model, Temporal Word Embeddings