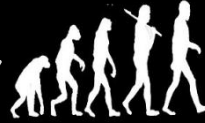


Understanding the Evolution of Circular Economy using Language Change

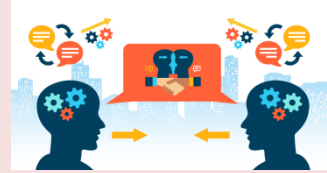
Sampriti Mahanty, Frank Boons, Julia Handl, Riza Batista Navarro



Language as an indicator of Scientific Development



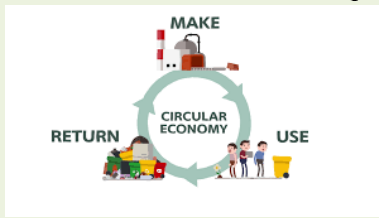
- Philosophers of science understood the process of scientific development using metaphors relating to 'Darwin's "Theory of Natural Selection"'.
 - Scientific development constituting an "evolutionary process".



- Production of scientific knowledge closely related to human language.
 - Scientific communities tend to use the same umbrella terms ("lexicon kind-terms").

Semantic change in Circular Economy Discourse

What is a Circular Economy?



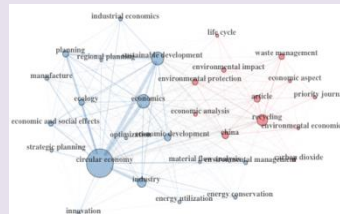
Why Circular Economy?

- Roots in Industrial Ecology (macro perspective), nowadays actively referred in context of micro level interventions such as product design, business models.
- Contemporary features evolved to incorporate features & concepts beyond CE which share theme of closed loops.

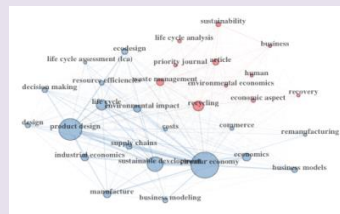
Methods and Results

- LDA Topic Modelling
- 3300 article abstracts
- Topic proportions over time
- Structural difference in 2015, helped identify early & contemporary periods

Generated keyword co-occurrences



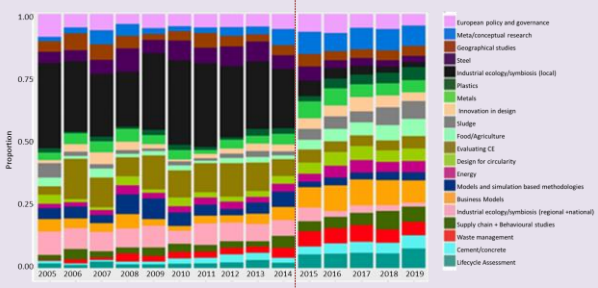
Early period



Contemporary period

- Full text articles
- Word embeddings by training two datasets
- Compared based on "Circular Economy"
- Cosine similarity bw 2 periods- 0.195

Early period	Contemporary period
Resource	Innovation
Materials	Business Models
Recycling	Social
China	Strategies
Environmental	Companies
Economic	Supply Chain
Industrial	Sustainable development



Findings

- Contemporary literature strongly linked to "business models", "supply chain", "product design".
- Early literature strongly linked to "ecology", "industrial economics", "environmental management".
- Concept undergone semantic change by additional layers being added, central theme remained same.