AI to Facilitate Legal Analysis in the PESTLE Context

MAURO VALLATI
ALESSIA GRASSI
PESTLE is a framework used to analyse uncontrollable external environmental factors.

It has been used for decades to help companies in taking challenging and complex decisions.

The model is particularly utilised when business are developing new products, or are expanding in new countries or new markets.

Managers and Marketers can conceptualise different scenarios, and develop potential alternatives.
The different elements of the PESTLE Analysis

Example: opening new stores in a country
How is PESTLE currently used?

- **Manually**: Human experts have to collect relevant information and analyse them.

- This makes particularly cumbersome to deal with Legal aspects:
  - Health and safety;
  - Advertisement policies;
  - Price transparency;
  - Patents & copyright;
  - Working conditions.
Importance of legal aspects

- By being able to effectively investigate and identify all the regulations necessary for their businesses, companies can:
  - Have a better understanding of the context
  - Avoid paying fines and penalties.

- Examples include GlaxoSmithKline forced to pay $3 billion for misbranding, and Google breaching Europe’s data privacy laws (GDPR)
Idea: AI for PESTLE

- We envisage a framework for exploiting emerging AI techniques for supporting the analysis of the Legal aspects of the model.

- Recent developments in AI, particularly KR&R, suggest that a large part of the Legal part of the PESTLE analysis can be supported by AI-based agents.
AI applications to legal domain are gaining importance
- Dedicates venues (conferences, journals)
- EU projects (MIREL)

Use of ontologies to represent information, and automated reasoning (e.g., argumentation) to deal with the queries

Human in the loop, and not on the loop.
Proposed Framework

- Ontology
- Argumentation and KR approaches
- Human-AI interaction
- Legal Docs
- Expert
- Argumentation and KR approaches
- AI
- Ontology
Main barriers to direct application

- Large body of regulations and laws not electronically stored
- Some degree of freedom (interpretation)
- Complexity of retrieving information and reasoning on large amount of data
  - Very hard to reason with more than few docs
- Representation of the Knowledge
Can we use ML?

- Mostly: no.
  - How to train?
  - Importance of explainability and transparency
  - Allowing the user to change query and investigate alternative options
Evaluation

- This is an open research question, and we are actively working on developing the framework and identifying suitable testing scenarios.

- We had some qualitative discussions with PESTLE and marketing experts.
  - Very well receipt: excitement of companies and experts.
Conclusions and future work

- Focus on legal aspect of the PESTLE analysis

- We introduced a framework for exploiting AI to support companies

- Future work:
  - Developing a prototype
  - Collaborate with companies and experts for scenario and HCI
  - Gather real data
  - Check if the framework can be extended to handle other PESTLE factors
Thank you!

Mauro Vallati, Alessia Grassi