CONSUMER ACCEPTANCE AND INNOVATIVE CIRCULAR BUSINESS MODEL

ECOSYSTEM DIGITAL TWIN AS AN ASSISTANCE TOOL FOR NOVEL STRATEGIES

MAGNO

Transforming EU food systems with innovative strategies for sustainable packaging

SUSTAINABILITY AND END OF LIFE OPTIONS

PACKAGING USE IN THE FOOD SYSTEM

PACKAGING MANUFACTURING PRACTICES

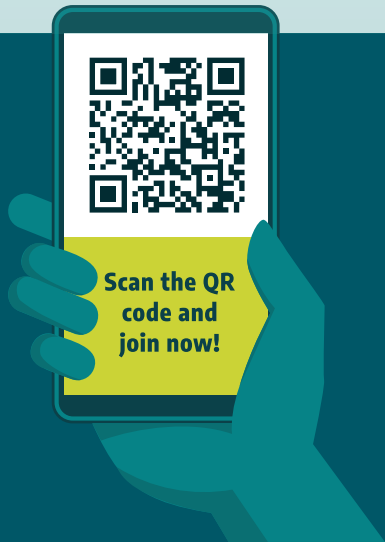
By leveraging cutting-edge technologies like AI-powered Digital Twins and advanced computational models, MAGNO is working to optimize the packaging lifecycle. This includes processes from design and production to end-of-life stages, such as recycling and reuse or Safe and Sustainable by Design approaches shaped for the ecological transition required by the European Green Deal and EU 2030 climate target plan.

Join our Multi-Actor Community and become part of MAGNO project!

This initiative unites stakeholders from the food packaging value chain, including companies, academic institutions, research centers, NGOs, local authorities, and European associations.

Why Join? Shape the Future:

Engage in key discussions that will shape the future of food packaging. Network: Discover synergies and connect with industry professionals. Early Access: Get a sneak peek at emerging trends, technological advancements, and consumer behavior studies. Collaborate: Participate in webinars, workshops, and initiatives with consortium partners. Innovate: Gain insights on digital solutions promoting a circular economy in food packaging.

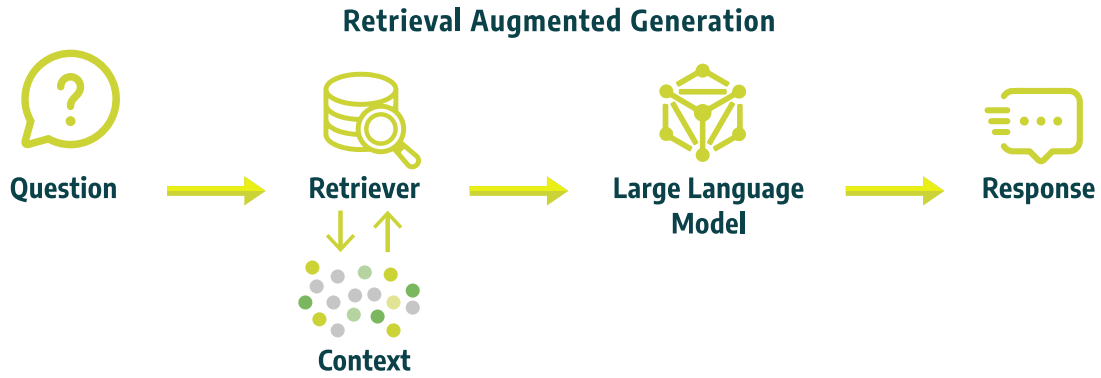


Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Commission. Neither the European Union nor the granting authority can be held responsible for them.

Funded by the European Union.

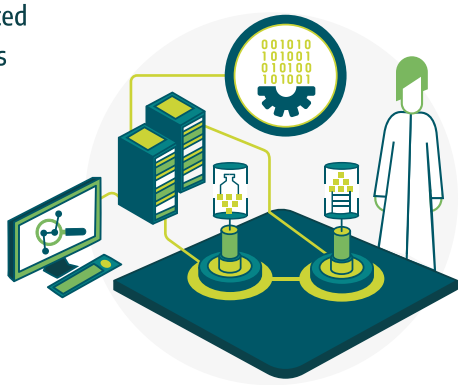
MAGNO on AI and NLP as drivers for a more sustainable food packaging value chain

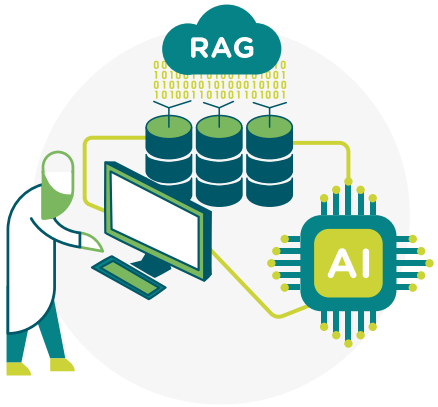
The European Union faces an enormous challenge with plastic waste. The EU seeks improving packaging effectiveness and sustainability, particularly in reducing plastic packaging pollution, which has become a top tier environmental concern. Addressing this issue is crucial not only for maintaining ecological balance but also for meeting consumer expectations and regulatory requirements focused on environmental sustainability. The planet cannot wait.



On MAGNO we advocate for AI and NLP (Natural Language Processing) to support research in packaging sector:

To tackle this problem, MAGNO has adopted a strategy that utilises advanced computational technologies, essential for collecting and analysing large amounts of data. This information then feeds into a **Digital Twin**, which basically is a digital replica of a real-world system that allows to simulate and optimise real-world functions. The project dedicates a big number of resources on developing and using up-to-date Machine Learning algorithms, more specifically **NLP** algorithms, to gain knowledge from an automatic web search, which will then be supplied to the Digital Twin.





These NLP algorithms include the development of a **RAG** (Retrieval Augmented Generation). RAG is a Generative AI tool that helps AI systems give accurate answers to specific questions by using relevant information from external data sources. Essentially, when the RAG needs to respond to a question, it first uses **embeddings** – mathematical representations of the words – to quickly locate the most useful information from a large database to provide an answer. Then, it combines this information with its own knowledge, using **LLMs** (Large Language Models), which are powerful tools capable of generating text that mimics how humans speak, and combining all of this, it builds an answer to the provided query.

By adopting MAGNO's NLP techniques, end-users can boost accuracy in packaging design and waste reduction, leading to significant cost savings and improved productivity. Further, they could enhance transparency towards their customers, building trust and developing new business models. It not only aids in meeting environmental regulations but also in fulfilling customer demands for sustainable packaging. Furthermore, using these advanced technologies helps keep up with a quickly changing industry and make a strongly positive impact on the environment urgently needed.