PROJECT FACTSHEET

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OCTogone

Designing a technological solution to optimize the management of waste sorting centres for construction sites.

Inspiration

All construction sites entail the production of waste that must then be eliminated in the best possible way. For this reason, it is impossible for the main contractor to ignore the sorting of waste. To be executed in an effective way, this activity requires a specific management. The main contractor then calls on companies specialized in waste management, such as the Luxembourgish company Polygone.
Faced with numerous variables and several types of waste, which change over the course of the project, this planning - both complex and largely 'manual' - in fact represents a significant combinatorial optimization challenge. Behind this challenge actually lies the hidden opportunity of achieving multiple efficiency and utility gains, attainable via the optimization of the essential features of waste sorting centres management (aspects such as stocks, transport, fleet, staff, installation, maintenance, etc.)
The optimization and automation of organisations and processes is a key expertise domain in which operates LIST researchers specialised in operations and supply chain optimization. This area is essential's to Polygone's vision, which sees it as a major differentiation opportunity on the market. Based on this assessment, Polygone and LIST have put in place a collaborative research project in view of creating a prototype answering this decision-making need.

Innovation

With OCTogone, the partners focus on optimizing the planning of waste sorting centres. For this, they automate the steps of the current process, create new calculation methods - in particular via the optimization of waste sorting centre utility criteria - and enhance the speed, precision and added value of this process. Together, the partners are developing an IT tool prototype, aiming to respond quickly and in an individual and optimal way to the needs of Polygone's customers. Furthermore, this will result in a technological solution that belongs to the very active research area on improving the sustainability of the urban environment and the management of resources. The first analysis and results already reveal a marked potential for efficiency and productivity gains compared to current practices. Likewise, it is also apparent that this approach can handle the main characteristics and constraints of the waste management process.

Impact

At the end of the project, the partners will have finalized a prototype of a decision-making tool for the management of waste sorting centres. The aim of the prototype is to validate the fact that the optimization and automation of the design of waste sorting centres allows businesses specialized in this area to become more efficient, highly performing and competitive. The course envisioned is that Polygone will then integrate this technology within its processes, still leveraging LIST's expertise.
More generally, the research carried out and the methods developed in the project constitute an experience feeding into LIST's knowledge in optimizing operations. This expertise has also been leveraged for several other projects, like for instance solutions in the automobile sector, or in the design of buildings and the urban environment, or matters related to mobility. To conclude, these skills in applied mathematics and data science can be used to quickly bring added value to businesses by helping them in their digital transformation process

Financial Support

Polygone

Contact

5, avenue des Hauts-Fourneaux
L-4362 Esch-sur-Alzette
phone: +352 275 888 - 1 | LIST.lu

Emile SIMON (emile.simon@list.lu)

LUXEMBOURG INSTITUTE OF SCIENCE AND TECHNOLOGY | LIST