

INTERVIEW WITH THOMAS SCHMITZ, CEO ZOELLER GROUP ABOUT ARTIFICIAL INTELLIGENCE IN WASTE MANAGEMENT

When it comes to artificial intelligence, most people first think of Chat GPT, Midjourney and similar generative technologies. AI. Its use in waste management may not seem so obvious at first. However, it offers many opportunities for more efficient work, for climate protection and the circular economy.

Where is artificial intelligence already being used in waste management and what opportunities does it offer?

AI is only being used very hesitantly in waste management - but the possibilities are enormous and offer huge potential.

For example, imaging AI systems use cameras to record the lorry environment and can detect littering, detect types of waste containers and proactively and independently move the lifting devices on the lorry into the correct position to provide the best possible support for the worker. They can recognise impurities in the collected waste fractions and also initiate a stop if too many metals are detected in a container not intended for this purpose, such as the organic waste bin.

However, AI is also becoming increasingly important in recycling plants and sorting facilities and will soon be indispensable. Robots are helping to separate objects by type - a „run“ is already beginning on material flows of the purest type so that they can be sent for correct recycling. This goes far beyond recognising materials. What an object was used for will become much more important, for example in the plastics sector: is the packaging from a food product or was it a machine oil bottle? In future, there will be digital recycling commodity exchanges where sorted material will be valued and sold according to its degree of purity.

It is becoming increasingly important to actively move towards a circular economy - but to do so, the topic must become „sexy“ and products and solutions must not be developed without the customer (commercial and municipal customers) in mind.

The topic of gamification has incredible potential to involve people directly. We should utilise certain trends and preferences in society, take disruptive paths and break old habits („we've always done it this way“) and reshape them.

Climate change presents us all with major challenges. What are these challenges in waste management and municipal waste disposal?

There are numerous different rules and regulations governing municipal waste disposal. Not only across countries, but sometimes they even differ from municipality to municipality within a country. For example, if someone moves to a different district or city, the way in which waste must be disposed of may differ. These formal hurdles naturally present citizens with unnecessary challenges. A standardised system or the use of the latest AI technology can help here.

How could artificial intelligence help to overcome such challenges and improve the efficiency of the waste management industry?

Specifically, AI can really help with the separation. With the daily flood of new products, citizens need easy and simple support on how something should be disposed of. This would be the simplest and most efficient way to achieve reasonably clean material flows and minimise the effort involved in sorting. Corresponding AI apps with object recognition could help here.

Recognising barcodes, QR codes, watermarks or RFID chips on products is not far-reaching enough and not general enough.

So can AI reduce mountains of waste and improve recycling rates?

AI cannot prevent mountains of waste. However, AI can help to keep the mountains of waste sorted, to separate it better and more efficiently and to recycle the relevant material flows in a targeted manner. The goal must be a zero-waste concept with which the circular economy conserves our natural resources and our planet can recover from overexploitation in the best possible way.

The waste management industry as a game changer for the environment?

Unfortunately or thankfully, the conflicts that are currently raging across countries are a drastic reminder of how important it is to operate sustainably and conserve resources. Whereas the industry used to be the end of every product, it now takes centre stage. The industry's final step is no longer disposal; instead, it is the absolute focus of recycling and reutilisation. However, the circular economy needs completely new, innovative approaches to tackle the issue. Our world is changing so rapidly that we can only master the challenges by using sustainable technology.

With DeepScan and SmartScan from SCANTEC, the ZOELLER GROUP has already put concrete applications of AI and smart technology on the road in the truest sense of the word. Is the technology already being used a lot?

By founding the start-up SCANTEC, the ZOELLER GROUP has taken responsibility and addressed the issue of sustainability through technology. The market is constantly growing and the two products mentioned are currently being placed on the market with great success. Various flagship projects have been successfully rolled out internationally and serve as showcase projects for other municipalities and partners.

How exactly do the systems work?

DeepScan works with the physical process of electromagnetic detection of metals. This enables plastic containers to be analysed and contaminants to be detected across the entire height and depth of the container even before they are emptied. SmartScan analyses the waste composition AI-based on the basis of optical data. Valuable information for continuous citizen communication is obtained from both systems using the ScanSuite online portal.

To what extent can the integration of AI in waste management contribute to achieving the sustainability goals of a municipality or city?

Various large municipalities have set themselves a zero-waste target. The use of AI and corresponding feedback can help to improve separation behaviour.

Material flows must be sorted by type and recycled in a targeted manner. The products of the ZOELLER GROUP/SCANTEC are information systems. The data obtained can help to provide targeted multilingual information right down to the level of the citizen. In today's society, language barriers should not be a reason for information not reaching its destination.

Where do local authorities stand when it comes to utilising AI?

Local authorities are also facing economic challenges. New technology must bring an advantage and not simply cost money. However, various ordinances provide a guideline here to help with tenders.

The current challenge is to launch an appropriate communication concept right down to the citizen level. After all, if material streams such as organic waste are separated correctly in households, this ultimately helps the local authority to operate a compost or biogas plant economically. Contaminated material flows can cause expensive plant malfunctions or even entire production line failures.

What role do citizens and local communities play in the implementation of AI solutions in waste management?

Society in general plays a decisive role in the implementation of the circular economy. One key to success will be to sensitise the mindset to the fact that a functioning circular economy will be a kind of guarantee of survival for future generations. The foundations we are laying now are fundamentally important.

The use of appropriate technology and continuous further development can help to ensure that the topic not only gains acceptance in society, but also becomes so interesting that in future no-one will think about the importance of a circular economy and it will become a matter of course.

What about data security? Many citizens are probably not particularly happy if someone, even if it is „only“ AI, „rummages“ through their rubbish and perhaps draws conclusions from it. Are such concerns justified?

Data security is very important in the circular economy. The Scantec technologies offered are and will be tested for correctness by independent institutes, such as TÜV, not only in accordance with the strictest data protection regulations, but also in accordance with the latest EU AI Act requirements. Throughout its history, the ZOELLER GROUP has always paid attention to absolute correctness in this regard. We only launch our developments on the market when we are 100 per cent sure that all legal requirements have been met. This may sometimes be a speed disadvantage, but in the end we work cleanly and correctly from the outset and do not have to make any subsequent improvements or accept grey areas.

In today's international society, where many cultures live and interact in close proximity, it is important to be as transparent as possible with the technologies used. Traceability, documentation and utilisation, i.e. what happens with which data, must not be a question, but a matter of course.

Finally, a quick look into the crystal ball: how do you see the future of waste management? Both in terms of AI and other technologies, as well as in terms of environmental protection, resource conservation and recycling.

The waste management industry has already begun to change into a circular economy. There are numerous successful processes in which the transition towards the reuse of material flows is working, for example PET-to-PET, glass recycling and building material recycling.

Technologies such as AI and robotics are currently developing and positioning themselves and will make a significant contribution to environmental protection, CO² reduction and resource conservation in all areas.

The challenges, but also the opportunities, lie in the diversity of the areas. These range from familiar topics such as building material recycling and mattress recycling to the exciting field of battery recycling.

But where a „gold-rush atmosphere“ could really arise would be if the mixed residual waste could be analysed for recyclables and valuable materials using appropriately trained AI.

The „holy grail“ would then lie in the many closed residual waste landfills around the world - opening these up to search for valuable resources that were deposited at the time and using robotics to mine and sort them again would certainly have enormous potential in the future.

The ZOELLER GROUP is ideally positioned here with its SCAN-TEC products and has the potential to claim the position of an internationally recognised gamechanger in the field of valuable recycling management.

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Any questions? Just give us a call.

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ABOUT THE ZOELLER GROUP

The ZOELLER GROUP is an expert in modern refuse collection vehicles and emptying systems for waste containers with headquarters in Mainz, Germany. In 2023, the group generated a turnover of over 578 million euros, employs over 3,000 people worldwide and produces in a total of nine countries.