AI4 WASTE

FOSTERING AWARENESS AND INNOVATION IN ADULT EDUCATION

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TOOLKIT

Case Study #2 of application of artificial intelligence to the urban waste management sector in Europe

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SUMMARY

Case Study #2 of application of artificial intelligence to the urban waste management sector in Europe – ZenRobotics Recycler (Finland).



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Case Study: ZenRobotics (Finland) - Artificial Intelligence (AI) and robotics

ZenRobotics is a Finnish company, is a pioneer in applying **Artificial Intelligence (AI) and robotics** to the waste management sector, particularly in automated waste sorting. Founded in 2007, ZenRobotics uses advanced AI-powered systems to transform the way recycling facilities operate, making the sorting of waste more efficient, accurate, and sustainable.

How ZenRobotic's Solutions Works

- ZenRobotics' flagship product, the ZenRobotics Recycler (ZRR), combines robotic arms with AI and computer vision to automatically sort and separate waste materials. The system is capable of identifying, picking, and separating recyclable materials such as plastics, metals, wood, and construction debris from mixed waste streams. This is achieved through:
    - **AI and Machine Learning Algorithms**: The AI system is trained using large datasets of waste material images, allowing the robot to learn how to identify and categorize different types of waste. Over time, the system improves its accuracy by continuously analyzing new data.
    - **Robotic Arms**: The system uses robotic arms equipped with sensors and cameras to pick out specific materials from conveyor belts. These robotic arms are capable of sortingup to 4,000 picks per hour with precision, a speed and accuracy that surpasses human labor.
    - **Advanced Sensors**: The robotic system uses various sensors, such as 3D laser scanning, metal detectors, and spectral cameras, to analyze the physical properties of the waste materials, like texture, color, and material composition, ensuring accurate identification.

Benefits of ZenRobotic's Solutions

- Increased sorting efficiency, cost savings, environmental impact, scalability and flexibility.

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