

Waste 4.0: Towards Digitalization in Waste Management Segregation

Nurul Mohamed Samir Khan, Sandeep Jagtap

Cranfield University, UK

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Medical Waste Categorization







1. The current system of color-coded bins is ineffective in monitoring the waste condition.





2. The generation of medical waste increasing over the years.

REPORTED MEDICAL WASTE TONNAGE IN

UK





3. Manual management in all medical waste procedures.





4. Non-specific digitalization planning in segregation the of medical waste.

Digitalization planning of medical waste



Shirke, S.I. et al. (2019)	Separation by moisture
Sen Gupta, Y. et al. (2021)	
Das, A. et al. (2021)	
Wang, H. et al. (2022)	QR code tagging
Sri Suvetha, C. et al. (2022)	360 camera image processing of 4 groups of waste



Research Questions

What is the importance of waste segregation in the healthcare industry?

How is the current method used in monitoring waste segregation? How can digitalisation help make adequate waste segregation and benefit the monitoring system as a whole?



Current Monitoring Methodology

Category	Colour code	Label
Sharps	Yellow	marked 'SHARP' with a biohazard symbol
Infectious Waste	Yellow	Biohazard symbol
Pathological	Yellow	Biohazard symbol
Pharmaceutical and Genotoxic	Brown	Hazard symbol
Chemical Waste	Brown	Hazard symbol
Radioactive waste	-	Radioactive symbol
General waste	Black	General waste



To propose a recommended method to digital the segregation of medical waste in hospitals.



- 1. To capture current approaches of medical waste segregation via a structured literature review.
- 2. To find a method to segregate the waste digitally without human intervention.





Research Method





Proposed Methodology



Proposed Method

Process facility

Proposed Method

- Decrease human intervention and injuries in waste management
- Decrease amount of hazardous waste
- Promote recycling

Digitalization of segregation will smooth the waste management procedures, generate real-time data that can be easily shared, reduce the amount of hazardous waste, and promote more recycles of waste from the healthcare industry

cranfield.ac.uk/people/nurul-hamizahbinti-mohamed-34092312

T: +44 (0)1234 750111

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