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A Persuasive Design Framework for Waste Management Application based on Maqasid al-Shari'ah: A Fuzzy Delphi Study

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Abstract

Municipal Solid Waste (MSW) management remains a critical challenge affecting environmental sustainability and public health. Existing technological interventions, however, often overlook the integration of Islamic ethical perspectives, particularly Maqasid al-Shari'ah (Objectives of Islamic Law), which provides a holistic foundation for responsible human behaviour. This study proposes a Persuasive Design Framework for waste management applications grounded in the five essential principles of Maqasid Al-Shari'ah i.e. preservation of religion, life, intellect, progeny, and wealth, aimed at promoting sustainable waste management practices among Muslim communities. Validation of the framework was conducted using the Fuzzy Delphi Method (FDM) with twelve

domain experts representing Islamic jurisprudence, Islamic economics, ICT and Islam, Human-Computer Interaction (HCI), and waste management. Two rounds of expert review identified 12 core persuasive elements comprising of reduction, tunneling, tailoring, personalization, self-monitoring, simulation, rewards, reminders, suggestion, liking, authority and verifiability. The findings demonstrate the potential of embedding Islamic ethical values within persuasive system design to strengthen intrinsic motivation, and behavioural compliance in waste management practices and provides actionable guidance for designing ethical and culturally relevant waste management solutions. © 2025 IEEE.

Author keywords

climate change; Maqasid al-Shariah; municipal solid waste management; persuasive system design framework

Indexed keywords

Engineering controlled terms

Behavioral research; Economics; Environmental management; Ethical aspects; Human computer interaction; Public health; Sustainable development; Systems analysis; Waste management

Engineering uncontrolled terms

Critical challenges; DELPHI study; Design frameworks; Fuzzy Delphi; Management applications; Maqasid al-shariah; Municipal solid waste management; Persuasive designs; Persuasive system design framework; Waste management practices

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