

Expert Based System Design for Integrated Waste Management

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Abstract : Recently, an increasing number of researchers have been focusing on working out realistic solutions to sustainability problems. As sustainability issues gain higher importance for organisations, the management of such decisions becomes critical. Knowledge representation is a fundamental issue of complex knowledge based systems. Many types of sustainability problems would benefit from models based on experts' knowledge. Cognitive maps have been used for analyzing and aiding decision making. A cognitive map can be made of almost any system or problem. A fuzzy cognitive map (FCM) can successfully represent knowledge and human experience, introducing concepts to represent the essential elements and the cause and effect relationships among the concepts to model the behavior of any system. Integrated waste management systems (IWMS) are complex systems that can be decomposed to non-related and related subsystems and elements, where many factors have to be taken into consideration that may be complementary, contradictory, and competitive; these factors influence each other and determine the overall decision process of the system. The goal of the present paper is to construct an efficient IWMS which considers various factors. The authors' intention is to propose an expert based system design approach for implementing expert decision support in the area of IWMSs and introduces an appropriate methodology for the development and analysis of group FCM. A framework for such a methodology consisting of the development and application phases is presented.

Keywords : factors, fuzzy cognitive map, group decision, integrated waste management system

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