Analyze the factors influencing human-robot interaction using MCDM method

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ABSTRACT
Robots play a key role in medical equipment manufacturing industry by safeguarding human workers from hazardous environment and risky jobs. Human robot interaction (HRI) is one of the robotic features that are enhanced in industrial robots. They mimic human behavior while arriving at a decision, contributing to the proficiency of the product. Tasks involving human cognitive skills and flexibility in the workers are combined with robots to obtain high-level accuracy, repeatability, and speed. Further, more challenges are to be met for achieving an effective human-robot interaction. In this paper, risk factors affecting the interaction between both robot and humans are discussed, and a contextual case is performed in a top south Indian medical equipment manufacturing industry. Industrial experts' inputs and relevant literature are considered to recognize the risk factors. Multi-Criteria decision-making method (MCDM) like DEMATEL (Decision Making Trial and Evaluation Laboratory) is used to analyze the risk factors influencing HRI in the assembly section. The paper's findings show that automation level and reliability of the robot are the most influential factor in the assembly section and need more attention to control and reduce the risk factor for the effective assembly.