

An integrated sustainable manufacturing strategy framework using fuzzy analytic network process

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ABSTRACT

This paper adopts a fuzzy analytic network process approach for developing a sustainable manufacturing strategy under the influence of stakeholders' interests. Frameworks developed in literature tend to structure manufacturing strategy in such a way that addresses market needs and expectations. As the move towards sustainability becomes highly pronounced, literature in domain manufacturing is developing approaches and initiatives that explore different facets of sustainability. However as this impetus becomes increasingly famous, manufacturing firms are faced with the challenge of integrating sustainability with the classical function of manufacturing, which is to support firms' competitive advantages. Thus, an inclusive approach would constitute a manufacturing strategy that would support not only sustainability but enhance the competitive strategy of a firm. In order to integrate these two objectives it is necessary to take into consideration the different stakeholders' interests as significant drivers towards sustainability. This work explores the significance of these interests when developing a manufacturing strategy using the proposed approach. In the proposed method, an analytic network process handles the complexity of the decision framework, and judgment elicitation during pairwise comparisons is described using linguistic variables with equivalent triangular fuzzy numbers. The proposed approach is useful when handling complexity and uncertainty especially in group decision-making. The content of the sustainable manufacturing strategy using a fuzzy analytic process is presented in this paper.

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Integrirana strategija trajnostne proizvodnje z uporabo analitičnega mrežnega procesa

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POVZETEK

Raziskava je bila namenjena prilagoditvi mehkega analitičnega mrežnega procesa za razvoj strategij trajnostne proizvodnje pod vplivom interesov vpletenih deležnikov. Iz literature je mogoče razbrati, da se proizvodne strategije poskuša strukturirati tako, da zadostijo pričakovanjem in potrebam trga. Ker je trajnostni razvoj vedno bolj zaželen, je mogoče zaslediti čedalje več razvojnih pristopov in pobud, ki raziskujejo različne vidike sonaravne proizvodnje. Podjetja morajo zato poleg izvajanja utečenega proizvodnega postopka vgraditi v svoj razvoj tudi načela trajnostnega razvoja, kar prispeva k njihovim konkurenčnim prednostim. Takšen celosten pristop torej ne vključuje le trajnostnega razvoja podjetja, ampak izboljšuje njegovo strategijo konkurenčnosti. Da bi spojili ta dva cilja je treba upoštevati interese različnih deležnikov. To delo raziskuje pomembnost teh interesov pri razvoju proizvodnih strategij z uporabo predlaganega pristopa. V predlaganem pristopu analitični mrežni proces obvladuje kompleksne odvisne povezave odločitvenega problema, medtem ko teorija mehkih množic obravnava nejasnost individualne presoje. Predlagan pristop je koristen, ko je treba obvladovati zapletenost in negotovost, še posebej v skupinskem odločanju.

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PODATKI O ČLANKU

Ključne besede:

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