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CODING, EVALUATION AND SELECTION OF AUTOMOBILE VEHICLES - A MADM APPROACH

An attempt has been made to develop a new methodology for coding, evaluation and selection of optimum auutomobile vehicle for a particular application, particular customer's / industry's requirements. The various conflicting attributes which characterize the automobile vehicles on basis of its structure and the performance of subsystems have been identified. These attributes are classified under different subsystems and evaluated and quantitatively to make the coding of each attribute. A new way of specification of the vehicle based on this coding procedure is developed. A database containing all the available vehicles in the market has been created, based on the proposed specification procedure. This 3-stages selection procedure, based on the MADM [Multiple Attribute Decision Making] ideology, starts with the 'Elimination Search' in which the large number of vehicle alternatives are reduced to a manageable shortlisted potentially suitable vehicle, using the pertinent atrributes. This selection procedure procedds to evaluate and then to rank the shortlisted alternatives by employing a cardinal preference MADM method, TOPSIS [Technique for Order Preference by Similarity to Ideal Solution]. An expert system has been developed as part of the software package to assist an inexperienced user to establish priorities and to oversee the selection process at various stages. Finally the suitable / optimum automobile vehicle is selected from, the list of ranked vehicles keeping in view the new priorities has been illustrated with the help of an example.

Key words: MADM method, expert system, motor vehicle, selection of vehicle, coding of vehicle.

KODIRANJE I SELEKCIJA MOTORNIH VOZILA METODOM "VIŠESTRUKIH ATRIBUTA"

U radu je data orginalna metodologiija za kodiranje i izbor motornih vozila prema zahtevima namene vozila, posebnim zahtevima kupaca i zahtevima industrije. Identifikovani su različiti atributi vozila koji se međusobno isključuju ako se uzmu u obzir različiti aspekti dizajna i performansi vozila. Ovi atributi su klasifikovani u različite podsisteme i svaki od njih je analiziran sa aspekta kvaliteta i kvantiteta. Na bazi ove procedure kodiranja vozila razvijen je novi metod identifikacije vozila. Autori su napravili bazu podataka koja sadrži podatke za raspoloživa vozila, a koji su smešteni tako da je omogućeno lako korišćenje predložene metodologije. Trostepena selekcija, bazirana na MADM metodi (metod određivanja višestrukih atributa), počinje tzv. "eliminacionim pretraživanjem" kojim se broj alternativnih atributa redukuje. Sledeći korak predstavlja rangiranje preostalih alternativnih atributa prema značaju - TOPSIS (tehnika rangiranja - težnja ka idealnom rešenju). Razvijen je ekspertni sistem koji je deo softverskog paketa i koji omogućava neiskusnim kupcima da utvrde prioritete pri izboru. Izbor vozila se vrši prema individualnim potrebama i željama iz postojeće baze podataka. Primerom je ilustrovan jedan mogući izbor vozila.

Ključne reči: MADM metod, ekspertni sistem, izbor vozila, kodiranje.