

FUZZY DECISION-MAKING MODEL FOR GROCERY STORE SELECTION WITH STRENGTH AND WEAKNESS ANALYSIS

(Model Pembuatan Keputusan Kabur untuk Pemilihan Kedai Runcit dengan Analisis Kekuatan dan Kelemahan)

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ABSTRACT

Decision-making is a complex process which involves assessment over multiple criteria in obtaining the best option. Usually, decision-making process is fashioned by uncertainty and vagueness due to lack of information and complexity of alternatives. This issue can be overcome by reducing the number of evaluations over pairwise comparisons using consistent fuzzy preference relation (CFPR). This research integrates the CFPR with weighted aggregated sum product assessment (WASPAS) approach to rank the best grocery stores by evaluating several criteria: price, convenience, freshness, service and parking area. Among these criteria, respondents tend to prioritize freshness or quality of products in selecting the best grocery store. The CFPR promises consistent decision preferences in evaluating the criteria weights, while the WASPAS combines the aggregated sum and aggregated product of decision preferences in ranking the alternatives. The stability of the obtained results is tested using different utility values in combining the weighted sum and weighted product of alternatives selection in WASPAS. Further, the strength and weakness of each grocery store are analysed over all criteria. The findings of the research can be shared with the grocery stores to improve their offered service to stay relevant in the industry.

Keywords: consistent fuzzy preference relation; grocery store selection; fuzzy decision-making

ABSTRAK

Pembuatan Keputusan merupakan suatu proses yang rumit, melibatkan penilaian terhadap beberapa kriteria dalam menentukan pilihan terbaik. Kebiasaanya, proses pembuatan keputusan dicirikan oleh ketidakpastian dan keraguan disebabkan kekurangan maklumat dan kerumitan alternatif. Masalah ini boleh diatasi dengan mengurangkan jumlah penilaian pada perbandingan berpasangan menggunakan hubungan keutamaan kabur konsisten (CFPR). Kajian ini menggabungkan CFPR dengan penilaian hasil tambah dan darab berpembarat beragregat (WASPAS) untuk memangkatkan kedai runcit terbaik dengan menilai beberapa kriteria: harga, keselesaan, kesegaran, servis dan kawasan parkir. Antara kriteria-kriteria ini, responden cenderung mengutamakan kesegaran atau kualiti produk dalam memilih kedai runcit terbaik. CFPR menjamin keutamaan keputusan yang tekal dalam pengiraan pemberat kriteria, manakala WASPAS menggabungkan hasil tambah dan hasil darab agregat keutamaan keputusan dalam pemeringkatan alternatif. Kestabilan keputusan yang diperolehi diuji menggunakan nilai utiliti berbeza dalam menggabungkan hasil tambah dan darab berpembarat bagi pemilihan alternatif dalam WASPAS. Seterusnya, kekuatan dan kelemahan setiap kedai runcit dianalisa berdasarkan semua kriteria. Hasil kajian boleh dikongsi bersama kedai-kedai runcit untuk meningkatkan servis yang ditawarkan untuk kekal relevan dalam industry.

Kata kunci: hubungan keutamaan kabur konsisten; pemilihan kedai runcit; pembuatan keputusan kabur

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