Optimization of a multi-objective location model of manufacturing base considering cooperative manufacturing capabilities and service benefits

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ABSTRACT

Improving customer satisfaction and shortening the manufacturing cycle have become common concerns of current manufacturers. This paper presents a multi-objective location model considering the maximization of collaborative manufacturing capabilities and service benefits. This method first uses the two dimensions of *customer share* and *market consumption* to segment customers, and identify the weight of various customer groups. Secondly, the space vector model (VSM) is used to calculate the matching between manufacturing capabilities and manufacturing requirements. Then build a multi-objective location model based on the two goals of collaborative manufacturing capabilities and service benefits. Finally, the model was tested with simulation data, which proved the validity and feasibility of the model. According to the simulation results, managers can accurately select the optimal manufacturing base from multiple candidate manufacturing bases with regard to less costs, shorter lead times, better manufacturing capabilities, better service benefits. In this paper, Fuzzy theory, Logit model and VSM are combined to solve the problem of manufacturing base location. Considering resources and service benefits of each manufacturing base, it is helpful to optimize the location of enterprises. From the academic and practical points, this study provides a new perspective for the location problem.

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Optimizacija večkriterijskega modela lokacije proizvodne baze ob upoštevanju sodelujočih proizvodnih zmogljivosti in storitvenih ugodnosti

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POVZETEK

Dandanes želijo proizvajalci izboljšati zadovoljstvo strank in skrajšati proizvodni cikel. Ta članek predstavlja večkriterijski lokacijski model, ki upošteva maksimiranje sodelujočih proizvodnih zmogljivosti in storitvenih ugodnosti. Za segmentacijo kupcev in ugotavljanje pomembnosti različnih skupin kupcev metoda najprej uporabi dve razsežnosti: *delež kupcev* in *tržno porabo*. Nato je uporabljen model prostorskih vektorjev (VSM) za izračun ujemanja med proizvodnimi zmogljivostmi in proizvodnimi zahtevami. V nadaljevanju je zgrajen večkriterijski lokacijski model, ki temelji na dveh ciljih, in sicer skupni proizvodni zmogljivosti in storitvenih ugodnostih. Na koncu je bil model testiran s simulacijskimi podatki, ki so dokazali veljavnost in izvedljivost modela. Glede na rezultate simulacije lahko menedžerji natančno izberejo optimalno lokacijo proizvodne baze izmed več možnih proizvodnih baz z upoštevanjem nizkih stroškov, krajših dobavnih rokov, boljše proizvodno zmogljivost in ugodnejše storitve. Da bi rešili težavo lokacije proizvodne baze so v tem članku združeni mehka logika, model Logit in VSM. Glede na vire in storitvene ugodnosti vsake proizvodne baze je koristno optimizirati lokacijo podjetij. Z akademskega in praktičnega vidika ta študija ponuja nov pogled na problematiko izbire lokacije.

PODATKI O ČLANKU

Ključne besede:

Proizvodna baza;
Lokacijski model;
Večkriterijski model;
Optimizacija;
Odločanje;
Preferenca povpraševanja strank;
Sodelujoča proizvodnja

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