Similarly, the total grey statistics of evaluation matrix of scheme B and C can be calculated.

$$(n_B)_{13\times1}=[22.05\ 21.64\ 21.46\ 22.32\ 22.57\ 22.91\ 22.05\ 22.32\ 22.10\ 22.46\ 23.23\ 23.14\ 22.46]^T$$

$$(n_C)_{13\times1}=[22.68\ 23.02\ 23.55\ 23.13\ 25.32\ 22.91\ 23.55\ 22.96\ 22.17\ 22.97\ 23.19\ 22.96\ 23.63]^T$$

e) Grey evaluation weight and weight matrix

Grey weight can be calculated according to formula (11).

$$r_{ij}=\frac{n_{ij}}{n_i} \tag{11}$$

Integrate grey weights which are the i-th evaluation factor arguing for the j-th evaluation criteria given by 10 experts. Single factor fuzzy evaluation weight matrix R which is composed of r_{ij} is as follows.

$$R=\begin{bmatrix} r_{11} & r_{12} & \cdots & r_{1m} \\ r_{21} & r_{22} & \cdots & r_{2m} \\ \cdots & \cdots & \cdots & \cdots \\ r_{n1} & r_{n2} & \cdots & r_{nm} \end{bmatrix} \tag{12}$$

Single factor fuzzy evaluation weight matrixes of the three schemes are calculated as follows.

$$R_A=\begin{bmatrix} 0.346 & 0.324 & 0.347 & 0.400 & 0.392 & 0.334 & 0.301 & 0.349 & 0.307 & 0.330 & 0.334 & 0.335 & 0.391 \\ 0.370 & 0.366 & 0.383 & 0.382 & 0.385 & 0.367 & 0.351 & 0.372 & 0.345 & 0.375 & 0.367 & 0.380 & 0.398 \\ 0.255 & 0.252 & 0.255 & 0.203 & 0.223 & 0.270 & 0.305 & 0.234 & 0.276 & 0.267 & 0.270 & 0.271 & 0.210 \\ 0.029 & 0.058 & 0.015 & 0.015 & 0.000 & 0.029 & 0.042 & 0.045 & 0.072 & 0.029 & 0.029 & 0.015 & 0.000 \end{bmatrix}^T$$

$$R_B=\begin{bmatrix} 0.378 & 0.401 & 0.414 & 0.353 & 0.364 & 0.335 & 0.378 & 0.363 & 0.377 & 0.356 & 0.306 & 0.322 & 0.356 \\ 0.395 & 0.396 & 0.399 & 0.378 & 0.405 & 0.380 & 0.395 & 0.365 & 0.381 & 0.394 & 0.332 & 0.364 & 0.394 \\ 0.227 & 0.203 & 0.186 & 0.224 & 0.230 & 0.271 & 0.227 & 0.242 & 0.226 & 0.249 & 0.276 & 0.285 & 0.249 \\ 0.000 & 0.000 & 0.000 & 0.045 & 0.000 & 0.015 & 0.000 & 0.030 & 0.015 & 0.000 & 0.086 & 0.029 & 0.000 \end{bmatrix}^T$$

$$R_C=\begin{bmatrix} 0.343 & 0.338 & 0.302 & 0.317 & 0.298 & 0.335 & 0.302 & 0.334 & 0.356 & 0.339 & 0.326 & 0.334 & 0.287 \\ 0.378 & 0.372 & 0.364 & 0.346 & 0.372 & 0.380 & 0.364 & 0.367 & 0.367 & 0.386 & 0.370 & 0.367 & 0.332 \\ 0.265 & 0.261 & 0.306 & 0.294 & 0.316 & 0.271 & 0.306 & 0.270 & 0.262 & 0.261 & 0.276 & 0.270 & 0.296 \\ 0.015 & 0.029 & 0.028 & 0.043 & 0.013 & 0.015 & 0.028 & 0.029 & 0.015 & 0.015 & 0.029 & 0.029 & 0.085 \end{bmatrix}^T$$

3) Use Fuzzy Mathematical to evaluate evaluation grade

a) Calculate the fuzzy comprehensive evaluation matrix B

The fuzzy comprehensive evaluation matrix B can be calculated based on compositional operation which is performed between weighted subset W and single factor fuzzy evaluation matrix R. $\sum_{i=1}^{m} b_i = 1$ will be made by normalization. The fuzzy evaluation matrixes for three evaluation schemes are as follows.

$B_A=[0.35, 0.37, 0.25, 0.03]$, $B_B=[0.37, 0.39, 0.23, 0.01]$, $B_C=[0.33, 0.37, 0.28, 0.02]$

b) Calculation the evaluation result Z

First, determine the grade matrix C ($C=[V_1, V_2, \cdots V_m]^T$). Then, according to Z=BC, calculate the comprehensive evaluation result Z. The evaluation for some scheme can be made by Z value. The bigger Z value is, the better the scheme is.

$Z_A = 7.06$, $Z_B = 7.24$, $Z_C = 6.98$ can be calculated.

4) The analysis on evaluation result

The three evaluation results are sorted as $P_B > P_A > P_C$ .Scheme B can be seen as an optimal solution. Consider comprehensively the key indexes of economy, technology and system operation in the construction of distribution centers, and make the most optimal configuration. The enterprise should adopt the scheme B as planning standards, and the scheme A as an alternative one. The result is stable by using the sensitivity analysis,

IV. CONCLUSION

Grey fuzzy comprehensive evaluation theory provides a new method for the evaluation of the distribution center planning scheme. Although this method has not been widely used in the planning scheme evaluation, but it has good effect in the distribution center location and other fields. Therefore, there is considerable room for development of grey fuzzy method in the field of logistics, and the method can very well compensate for the limitations of existing models in practice.

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