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An Entropy Decision Model for Selection of Enterprise Resource Planning System

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Abstract- **There exist some several method offer similar functions and current technologies are poor to discriminate the important weights of attributes of enterprise resource planning system, due to the complexity of metrics and involvement of consumer's vague perception. Entropy method is used to determine the weight of evaluation indexes and establish multi-level fuzzy synthetic evaluation model. Its application is illustrated with example, which can provide the intuitive and effective method for decision-makers in enterprise resource planning system selection. In this paper, we introduce a linguistic entropy method and fuzzy synthetic evaluation method. Moreover, a satisfaction-based index of software quality model is established to perform the discrimination of fuzzy ranking of alternatives. Finally, a numerical example is given to demonstrate the process of enterprise resource planning system selection. The experimental results demonstrated that it is a feasible and trustworthy manner to select of the system selection using the proposed scheme.**

Keywords- fuzzy synthetic evaluation method, Linguistic entropy method, enterprise resource planning

I. INTRODUCTION

Enterprise Resource Planning (ERP) system which makes business process more efficiency and business management more simplified is one of the most important information to organizations. Business worked to improve their efficiency and reduced their lead time to customer. But defining ERP is still difficult because there are many variations of the term within the manufacturing literature [13]. ERP software companies developed many standalone applications for product data management, detailed execution system support, final assembly configurations and many other areas of the business decision support. Wognum et al.[31] indicated that when organizations implement such large like ERP systems should regard as a project implementing and devote full participation in it. Besides, owing to the complexity of the business environment, the limitations in available resources and the diversity of ERP alternatives, ERP system selection is a tedious and time consuming [30]. Therefore, ERP system selection is crucial in the early phase of ERP implementation of project.

ERP system selection is one of business management major direction. Many studies have demonstrated that data mining such as Analytic Hierarchy Process (AHP), Fuzzy synthesis evaluation, neural networks, Data Envelopment Analysis (DEA) and Grey Relation Analysis (GRA) ([1], [2], [4], [9],[17], [19], [24], [32], [35], [36]).

Many researchers ([3], [28]) who have studied the fuzzy AHP which are extension of Saaty's theory have provided evidence that fuzzy AHP shows relatively more sufficient description of these kinds of decision making processes compared to the traditional AHP methods. The specific fuzzy AHP methods can be found in ([5], [6], [15], [16], [20], [27]). The critical problem of using the AHP model to evaluate the ERP implementation readiness is to determine the index weights of the indices and their index values. Usually, the index weight can be allocated using subjective methods like fuzzy synthetic evaluation method, AHP method etc., or objective methods like entropy method, main factor analysis method [10]. When adopt the subjective methods, it relies on the experts' experience too much. Although the objective methods is according to the interrelationship of the indices and their variant degree of the samples to determine the indices weight, thus can avoid the man-made influence, but it is affected easily by the random error of the samples. In order to avoid these influence, we combination the fuzzy synthetic evaluation method with the entropy method to get an entropy fuzzy synthetic evaluation method [22].

II. EVALUATION INDEX SYSTEM OF THE ERP SYSTEM

When implementing in ERP project, price and time are both the most important factor, besides, the vender's support is also a crucial issue [25]. Wei and Wang [30] shift three categories of attributes to select an ERP system including project factors, software factors and vender factors. Everdingen et al.[8] explored that software system and supplier are the major criteria which contains 10 sub-criteria for selecting an ERP system. ISO 9126 is an international standard for the evaluation of software quality. The fundamental objective of this standard is to address some of the well known human biases that can adversely affect the delivery and perception of a software development project. Therefore, the ISO 9126 software quality model is also been chosen to describe the software quality characteristics in our proposed procedure. The quality model established in the first part of the standard, ISO 9126-1, classifies software quality in a structured set of characteristics and sub-characteristics as follows [21]:

- Functionality - A set of attributes that bear on the existence of a set of functions and their specified properties. The functions are those that satisfy stated or implied needs. Functionality (C_1) contains 5 criteria: Suitability (C_{11}), Accuracy (C_{12}), Interoperability (C_{13}), Compliance (C_{14}), and Security (C_{15}).
- Reliability - A set of attributes that bear on the capability of software to maintain its level of performance under stated conditions for a stated period of time. Reliability (C_2) contains 3 criteria: Maturity (C_{21}), Recoverability (C_{22}), and Fault Tolerance (C_{23}).
- Usability - A set of attributes that bear on the effort needed for use, and on the individual assessment of such use, by a stated or implied set of users. Usability (C_3) contains 3 criteria: Learn ability (C_{31}), Understandability (C_{32}) and Operability (C_{33}).
- Efficiency - A set of attributes that bear on the relationship between the level of performance of the software and the amount of resources used, under stated conditions. Efficiency (C_4) contains 4 criteria: Time Behaviour (C_{41}), and Resource Behaviour (C_{42}).
- Maintainability - A set of attributes that bear on the effort needed to make specified modifications. Maintainability contains 4 criteria: Stability (C_{51}), Analyzability (C_{52}), Changeability (C_{53}) and Testability (C_{54}).
- Portability - A set of attributes that bear on the ability of software to be transferred from one environment to another. Portability (C_6) contains 4 criteria: Install ability (C_{61}), Replace ability (C_{62}), Adaptability (C_{63}), and Conformance (C_{64}).

Each quality sub-characteristic (e.g. adaptability) is further divided into attributes. An attribute is an entity which can be verified or measured in the software product. Attributes are not defined in the standard, as they vary between different software products. Six second-level targets including functionality, reliability, usability, efficiency, maintainability, and portability have been used for the comprehensive and systematic evaluation of the software quality characteristics. Regarding each second-level target, the segmentation has been proposed by twenty one third-level targets. These indicators are constituted for the ERP system evaluation index system as show in Fig 1.

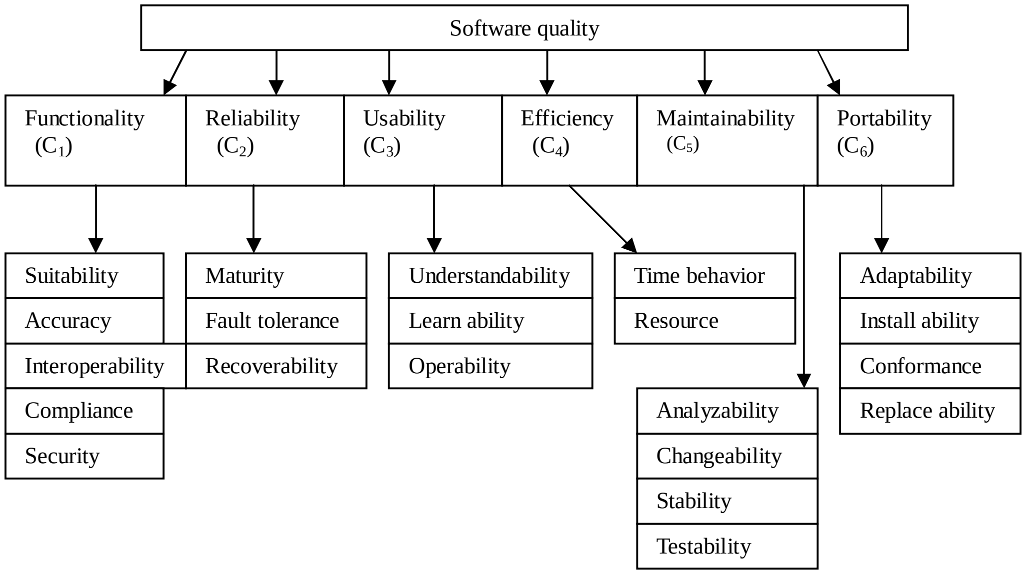

Figure 1 Indices for assessing the ERP system

III. THE PROPOSED MODEL

A new resolution process to select ERP system, extending Zenley's entropy method [34] to evaluate the fuzzy weight of ERP attributes and outrank the ERP system is proposed in this section. Our proposed method is composed of the enhanced version of linguistic entropy method and fuzzy synthetic evaluation method which will be described as follows.

A. Basic definition of fuzzy number

IN this section, we review some arithmetic operations on fuzzy numbers for the purpose of representing the proposed algorithm in the following section.

Definition 1: A triangular fuzzy number $\tilde{A}$ is the special class of fuzzy number whose membership defined by three real numbers, expressed as (*a, b, c*).

$$\tilde{A}(x) = \mu_{\tilde{A}}(x) = \begin{cases} (x-a)/(b-a), & a \le x \le b \\ (c-x)/(c-b), & b \le x \le c \\ 0 & otherwise \end{cases} \quad (1)$$

Definition 2**:** α-cut. The α-cuts of fuzzy number $\tilde{A}^{\alpha}$ is defined by

$$\forall \alpha \in [0,1] \quad \tilde{A}^{\alpha} = \{x_i : u_{\tilde{A}}(x_i) \ge \alpha, x_i \in X\}$$

Where $\tilde{A}^{\alpha}$ is non-empty bounded closed interval contained in X and $\alpha \in [0,1]$. It represents the interval of confidence at level α and denotes as

$$\tilde{A}^{\alpha} = [a_L^{\alpha}, a_R^{\alpha}] = [(b-a)\alpha + a, -(c-b)\alpha + c] \quad (2)$$

Definition 3: Fuzzy arithmetic operations. The arithmetic operations of the positive fuzzy numbers described by the interval of confidence are expressed below:

Addition $\oplus$:

$$(a_1, b_1, c_1) \oplus (a_2, b_2, c_2) = (a_1 + a_2, b_1 + b_2, c_1 + c_2)$$

Subtraction □ :

$(a_1,b_1,c_1)\ominus(a_2,b_2,c_2)=(a_1-a_2,b_1-b_2,c_1-c_2)$ (3)

Multiplication $\otimes$:

$(a_1,b_1,c_1)\otimes(a_2,b_2,c_2)=(a_1a_2,b_1b_2,c_1c_2)$

Division /: $(a_1,b_1,c_1)/(a_2,b_2,c_2)=(a_1/c_2,b_1/b_2,c_1/a_2)$

Definition 4: The normalized Hamming distance between two triangular fuzzy numbers (TNF). If $\tilde{A}$ and $\tilde{B}$ are two TFNs, then the normalized Hamming distance between $\tilde{A}$ and $\tilde{B}$ can be calculated as:

$$I(\tilde{A},\tilde{B})=\left\|\tilde{A}-\tilde{B}\right\|=\sum_{i=1}^{n}\left|\tilde{\mu}_A(x_i)-\tilde{\mu}_B(x_i)\right|$$

$$=\sum_{x\in X}\left|\tilde{\mu}_A(x)-\tilde{\mu}_B(x)\right| \tag{4}$$

B. Fuzzy entropy measure

Shannon and Weaver [26] employed to estimate uncertainty of object based on information theory using probability function. It can be represented by

$$H(p(x))=-k\sum_{k=1}^{q}p(x_k)\ln p(x_k) \tag{5}$$

De Luca and Termini [7] defined non-probabilistic entropy of fuzzy set. It is a measure the degree of "fuzziness" of fuzzy set $\tilde{A}(x)$. This definition uses the membership function $\mu_{\tilde{A}}(x)$ to replace the Shannon's probability function $p(x_k)$ by:

$$H(\tilde{A}(x))=-k\sum_{k=1}^{q}u_{\tilde{A}}(x_k)\ln u_{\tilde{A}}(x_k), \tag{6}$$

where k is the normalized constant which equals to 1/ln q. Yager [33] introduced another form entropy function of fuzzy set based on distances function between the fuzzy set and its component,

Definition 5**:** The entropy of fuzzy set $\tilde{A}(x)$, $H(\tilde{A}(x))$ is defined as the summation of difference between a given fuzzy set (each for $x\in X$) and its fuzzy complement [33].

$$H(\tilde{A}(x))=\sum_{x\in X}(1-I(\tilde{A}(x),\tilde{A}^c(x))), \tag{7}$$

Where $I(\tilde{A}(x),\tilde{A}^c(x))$ represents the normalized Humming distance of $\tilde{A}(x)$, $\tilde{A}^c(x)$ represents fuzzy complement of $\tilde{A}(x)$, i.e. $\tilde{A}^c(x)=1-\tilde{A}(x)$.

$$\tilde{A}^c(x)=\mu_{\tilde{A}^c}(x)=\begin{cases}(b-x)/(b-a), & a\le x\le b\\(x-b)/(c-b), & b\le x\le c\\1 & otherwise\end{cases} \tag{8}$$

C Establishment of the evaluation set

Consider the problem of ERP system $s_i:(i=1,\ldots,m)$. A group of decision marks $d_k:(k=1,\ldots,q)$ is formed to identify ERP attribute based on both crisp and linguistic terms regarding a set of attribute alternative $c_j:(j=1,\ldots,n)$. Since Satty's pair-wise comparison matrix might create an unbalanced scale of judgment, the ratings assigned by decision makers are designed in linguistic terms which is fixed interval of five-scale linguistic term, for assessing its normalized weights of ERP attributes as Table 1. And then assign performance rating to the alternatives for each attribute with Table 2.

Table 1 Linguistic Terms for the weigh of c_j

Linguistic Terms	Triangular fuzzy number
Very low (VL)	(0.0,0.0,0.1)
Low (L)	(0.0,0.1,0.3)
Medium low (ML)	(0.1,0.3,0.5)
Medium (M)	(0.3, 0.5,0.7)
Medium high (MH)	(0.5,0.7,0.9)
High (H)	(0.7,0.9, 1.0)
Very high (VH)	(0.9,1.0,1.0)

Table 2 Linguistic Terms for the rating of each alternative

Linguistic Terms	Triangular fuzzy number
Very poor (VP)	(1,1,3)
Poor (P)	(1,3,5)
Fair (F)	(3,5,7)
Good (G)	(5,7,9)
Very good (VG)	(7,9,9)

D. Formation of the fuzzy evaluation matrix [29]

The rating on important of ERP attributes are represented by a fuzzy rating matrix $\tilde{R}=[\tilde{r}_j^k]$, where $\tilde{r}_j^k$ denotes the linguistic rating of attribute c_j assessed by d_k is showed as

$$[\tilde{r}_j^k]_{q\times n} = \begin{array}{c} d_1 \\ d_2 \\ \\ \\ d_q \end{array} \begin{bmatrix} \tilde{r}_1^1 & \tilde{r}_2^1 & & \tilde{r}_n^1 \\ \tilde{r}_1^2 & \tilde{r}_2^2 & & \tilde{r}_n^2 \\ & & & \\ & & & \\ \tilde{r}_1^q & \tilde{r}_2^q & & \tilde{r}_n^q \end{bmatrix} \quad (9)$$

The entropy method [18] is an object empowerment approach, in which the weight values of individual indicators are determined by calculating the entropy and entropy weight. The amount of useful information that the target provides to the decision-maker is reduced. If the entropy weight is zero, it provides no useful information to the decision-maker, and this indicator may be removed [12]. The main steps of the entropy weight method include: the information of the evaluation matrix; the standardization of the evaluation matrix; the calculation of the entropy and the entropy weight. By the definition of Yager's entropy function of fuzzy set [33], the fuzzy entropy measure of an attribute is denoted as e_j

$$e_j = H(\tilde{r}_j) = \sum_{x\in X}(1 - I(\tilde{r}_j(x), \tilde{r}_j^c(x))) \qquad (10)$$

Where $\tilde{r}_j = \frac{1}{q} \otimes (\tilde{r}_j^1 \oplus .... \oplus \tilde{r}_j^q)$, it might be crisp or fuzzy form depending on nature of ERP attributes: $\oplus$ and $\otimes$ represents fuzzy additive and multiplication operation that defined in definition 4. By the definition fuzzy entropy, e_j represents the amount of uncertainty with respect to the j the attribute. The relative weighting of j th attribute can be measured by the normalization of complement of e_j, i.e., 1-e_j. The normalization fuzzy weighting of $\tilde{r}_j$ is given by ([22], [34])

$$w_j = (1 - e_j)/(n - \sum_{i=1}^{n} e_i) \qquad (11)$$

As can be seen from the above, $0 \le w_j \le 1$ and $\sum_{i=1}^{n} w_i = 1$

E. The fuzzy synthetic evaluation

The decision makers have to assign the performance ratings to each ERP systems s_i with respect to attribute c_j. The fuzzy performance rating matrix $\tilde{X}$ is shown as

$$\tilde{X} = [\tilde{x}_{ij}]_{m\times n} = \begin{array}{c} s_1 \\ s_2 \\ \\ \\ s_m \end{array} \begin{bmatrix} \tilde{x}_{11} & \tilde{x}_{12} & & \tilde{x}_{1n} \\ \tilde{x}_{21} & \tilde{x}_{22} & & \tilde{x}_{2n} \\ & & & \\ & & & \\ \tilde{x}_{m1} & \tilde{x}_{m2} & & \tilde{x}_{mn} \end{bmatrix} \quad (12)$$

where $\tilde{x}_{ij} = \frac{1}{q} \otimes (\tilde{x}_{ij}^1 \oplus .... \oplus \tilde{x}_{ij}^q)$, $\tilde{x}_{ij}^k$ represents the individual fuzzy rating of ERP system s_i with respect to attribute c_j assessed by d_k; $\tilde{x}_{ij}^k$ might be crisp or fuzzy form depending on nature of ERP attributes. To rank the ERP system compatibly between evaluation attributes, the matrix $\tilde{X}$ has to be normalized for transforming the distinct scales of attributes into a numerically comparable scale. For ERP system attributes, there exist two basic types: utility-oriented and cost-oriented attributes. Both are mutually conflict and inconsistent and need to tradeoff. A linear scale transformation is applied for forming the normalized fuzzy rating matrix $\tilde{R}$ to avoid the complicated normalization as follows.

$$\tilde{R} = [\tilde{r}_{ij}]_{m\times n}$$

$$\forall j \in utility\ attributes, \tilde{r}_{ij} = \tilde{x}_{ij} / \tilde{x}_j^+ = (\frac{a_{ij}}{c_j^+}, \frac{b_{ij}}{c_j^+}, \frac{c_{ij}}{c_j^+}) \wedge 1$$

$$= (\tilde{a}_{ij}^u, \tilde{b}_{ij}^u, \tilde{c}_{ij}^u)$$

$$\forall j \in cost\ attributes, \tilde{r}_{ij} = \tilde{x}_{ij} / \tilde{x}_j^- = (\frac{a_j^-}{c_{ij}}, \frac{a_j^-}{b_{ij}}, \frac{a_j^-}{a_{ij}}) \wedge 1$$

$$= (\tilde{a}_{ij}^c, \tilde{b}_{ij}^c, \tilde{c}_{ij}^c) \qquad (13)$$

where

$$\tilde{x}_j^+ = \max_j(a_{ij}, b_{ij}, c_{ij}) = c^+_j, if\ \ j \in unility\ attributes,$$

$\tilde{x}_j^- = \min_j(a_{ij}, b_{ij}, c_{ij}) = a_j^-, if \ \ j \in \cos t \ attributes,$

The matrix $\tilde{R}$ is constructed by m alternatives of ERP system and n alternatives of attributes. u,c belongs to a set of utility attributes and cost attributes, respectively. It needs to avoid generating an outbound condition (i.e., $\tilde{r}_{ij}$ exceeds to the value 1), $\tilde{r}_{ij}$ has to be constrained by upper bound 1.

After the evaluation matrix $\tilde{R} = [\tilde{r}_{ij}]_{m\times n}$ and the weight vector w= $[w]_{1\times n}$ are obtained, the comprehensive evaluation results of the current level can be determined through fuzzy arithmetic operations, then the final evaluation results can then be obtained through the stepwise computation, as formulated below ([11], [23]):

$$\tilde{Q}(s_i) = [\tilde{r}_{ij}] \otimes [w_j]^t =$$

$$\begin{bmatrix} \tilde{r}_{11} & \tilde{r}_{12} & & \tilde{r}_{1n} \\ \tilde{r}_{21} & \tilde{r}_{22} & & \tilde{r}_{2n} \\ & & & \\ \tilde{r}_{m1} & \tilde{r}_{m2} & & \tilde{r}_{mn} \end{bmatrix} \otimes \begin{bmatrix} w_1 \\ w_2 \\ \\ w_n \end{bmatrix}$$

$$= \begin{bmatrix} (\tilde{r}_{11} \otimes w_1) \oplus (\tilde{r}_{12} \otimes w_2) \oplus .... \oplus (\tilde{r}_{1n} \otimes w_n) \\ (\tilde{r}_{21} \otimes w_1) \oplus (\tilde{r}_{22} \otimes w_2) \oplus .... \oplus (\tilde{r}_{2n} \otimes w_n) \\ \\ (\tilde{r}_{m1} \otimes w_1) \oplus (\tilde{r}_{m2} \otimes w_2) \oplus .... \oplus (\tilde{r}_{mn} \otimes w_n) \end{bmatrix} \qquad (14)$$

However, the aggregation results $\tilde{Q}(s_i)$ is still fuzzy number, which cannot be applied directly to outrank the ordering. The α cut of fuzzy numbers can provide a comparable-based ranking for alternatives. The α cut analysis is applied to transform the total weighted performance matrices into interval performance matrices which are showed with α Left and α Right for each alternative as follows:

$$\tilde{Q}^{\alpha}(s_i) = [\tilde{Q}_{iL}^{\alpha}, \tilde{Q}_{iR}^{\alpha}], \text{ i = 1, 2,…, m} \qquad (15)$$

where, $\tilde{Q}_{iL}^{\alpha}, \tilde{Q}_{iR}^{\alpha}$ represents left and right side of interval for $\tilde{Q}^{\alpha}(s_i)$ respectively.

It is done by applying the λ function which represents the attribute of the decision maker that is maybe optimistic, moderate or pessimistic. They are responded λ to =0, 0.5, 1.0. Decision maker with optimistic attribute will take the medium lambda and the pessimistic person will take the minimum λ in the range of [0, 1] as follows:

$$\tilde{Q}^{\alpha}(s_i) = \lambda * \tilde{Q}_{iR}^{\alpha} + [(1-\lambda) * \tilde{Q}_{iL}^{\alpha}] \qquad (16)$$

IV. AN ILLUSTRATION EXAMPLE

A numerical example is used to demonstrate the developed comprehensive evaluation method. There have three alternatives of ERP system for selection, s_i (i =1, 2, 3). There have four decision marks, $d_k : (k = 1,...,4)$. The main steps of the developed method are:

Step 1. Determine the factor set and evaluation set

The details of these attributes are listed in section 2.

Step 2: Determine the weight of each sub-criteria using the entropy weight method

The decision makers use the linguistic terms denoted table 1 to product the weight rating. The entropy of the jth attribute is computed using Eq. (10) as the four column of Table 3. The entropy weight value of the jth attribute is computed using Eq. (11) as the five column of Table 3.

Step 3: Evaluating the score of each alternative

The decision makers use the linguistic terms denoted table 2 to product the score of each alternative with respect to ERP attribute. The average individual rating to product the fuzzy decision matrix use Eq. (12), normalize its using Eq. (13).

Table 3 The weightings of attribute

	Criteria	Sub-criteria	e_j	w_j
1	C_1	C_{11}	0.733	0.0545
2		C_{12}	0.8	0.0408
3		C_{13}	0.633	0.0749
4		C_{14}	0.9	0.0204
5		C_{15}	0.733	0.0545
6	C_2	C_{21}	0.633	0.0749
7		C_{22}	0.8	0.0408
8		C_{23}	0.733	0.0545
9	C_3	C_{31}	0.8	0.0408

10		C_{32}	0.8	0.0408
11		C_{33}	0.9	0.0204
12	C_4	C_{41}	0.8	0.0408
13		C_{42}	0.8	0.0408
14	C_5	C_{51}	0.733	0.0545
15		C_{52}	0.633	0.0749
16		C_{53}	0.8	0.0408
17		C_{54}	0.633	0.0749
18	C_6	C_{61}	0.733	0.0545
19		C_{62}	0.8	0.0408
20		C_{63}	0.8	0.0408
21		C_{64}	0.9	0.0204

Step 4: Aggregating the synthetic scores

The final evaluation results can then be obtained through the stepwise computation, as formulated below:

$\tilde{Q}(s_i) = [\tilde{r}_{ij}] \otimes [w_j]^t$

=

$$\begin{array}{c} \\ s_1 \\ s_2 \\ s_3 \end{array} \begin{array}{c} C_{11} \ldots\ldots\ldots\ldots\ldots C_{12} \qquad\qquad C_{64} \\ \begin{bmatrix} (0.333 & 0.555 & 0.777), \ldots\ldots & (0.555 & 0.777 & 1.000) \\ (0.555 & 0.777 & 1.000), \ldots\ldots & (0.333 & 0.555 & 0.777) \\ (0.333 & 0.555 & 0.777), \ldots\ldots & (0.555 & 0.777 & 1.000) \end{bmatrix} \end{array} \otimes \begin{bmatrix} w_1 \\ w_2 \\ \\ \\ w_{21} \end{bmatrix}$$

$$= \begin{bmatrix} (0.438 & 0.661 & 0.843) \\ (0.335 & 0.508 & 0.712) \\ (0.392 & 0.591 & 0.824) \end{bmatrix}$$

The aggregation result $\tilde{Q}(s_i)$ is a still fuzzy number, which cannot be applied directly to outrank the ordering. Calculate the judgment matrix using Eq. (15) as follows:

$\tilde{Q}^{\alpha}(s_1)$ = (0.438+0.233 α , 0.843- 0.182 α), $\tilde{Q}^{\alpha}(s_2)$ = (0.335+ 0.173 α , 0.712-0.204 α), and $\tilde{Q}^{\alpha}(s_3)$ = (0.392+0.199 α , 0.824 -0.233 α).

$Q(s_1)$ = (1- λ)(0.438+0.233)+ λ (0.843- 0.182 α), $Q(s_2)$ = (1- λ)(0.335+0.173 α)+ λ (0.712-0.204 α), and $Q(s_3)$ = (1- λ)(0.392+0.199 α)+ λ (0.824 -0.233 α)

Step 5: Outranking the order of alternative

A set of crisp score for each alternative is attained through the selection of α and index of optimism degree λ using Eq. (16). These kinds of satisfaction degree (pessimistic, moderate, and optimistic; λ = 0, 0.5, 1.0 respectively) are considered and its corresponding α = 0.05, to construct the matrix integrated judgments shown in Table 4.

Table 4 judgment matrix

	Pessimistic λ =0	Moderate λ =0.5	Optimistic λ =1.0
S_1	0.44965	0.64177	0.8339
S_2	0.34365	0.52272	0.7018
S_3	0.40195	0.60710	0.8123

From the Table 4, the ranking order of three ERP system can be stated as $S_1 > S_3 > S_2$ for λ =0, 0.5, 1.0. In summary, a decision of selecting S1 is suggested.

V. CONCLUSION

This paper presents an evaluation index system for the quality of ERP system based on the fuzzy comprehensive evaluation and weight method. The proposed linguistic entropy could effectively screen the insignificant attributes, objectively analyze the importance weights of ERP system alternative and compatibly prioritize alternative of ERP system. The experimental results demonstrated that it is a feasible and trustworthy manner to select of the system selection using the proposed scheme. The further research will focus on performing the ranking of index system and selection with fuzzy linear programming technique.

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