

A Model Based on Linguistic of Transferring Qualified Personnel Resource to Qualified Personnel Capital

Weiya Miao¹ Linxiang Zhang²

1.School of Management, Electronic University of Science and Technology of China, Chengdu 610054, China

2. Luzhou committee organizing department of CCP, Luzhou 64600,China

Abstract

This paper presents a model based on linguistic value for the transform from qualified personnel resource to qualified personnel capital. It is important to transform from qualified personnel resource to qualified personnel capital for transferring the mode of economic increase in many countries. The model of fuzzy comprehensive evaluation is established to explain the method of comprehensive benefit-evaluation for the transform from qualified personnel resource to qualified personnel capital. However, the model based on linguistic value is better than the fuzzy comprehensive evaluation to explain people's habit of thought.

Keywords: Qualified personnel resource, Qualified personnel capital, Benefit-evaluation, Linguistic evaluation

1. Introduction

Transferring qualified personnel resource to qualified personnel capital is one of the key contents of knowledge economy, and realizing the transformation is also one of the major contents of research on qualified personnel resource management. As is well known, the qualified personnel resource has become the most important resource that can develop continuously at present, and the qualified personnel capital has been becoming one of the crucial factors of the enterprise, regional economy and even the national comprehensive competition. Transferring qualified personnel resource to qualified personnel capital is an important measure to realize countries' socioeconomic sustainable development, so it has important theory with actual meanings of study on the evaluation of transferring qualified personnel resource to qualified personnel capital (Beker, 1962; Alexander, 1983; Amit & Belcourt, 1999; Ban-dyopadhyay, 2003; Schultz, 2003). It's not only existing many factors with fuzzy information and stochastic information in

the process of transferring the qualified personnel resource to qualified personnel capital, but also is facing with many difficulties in the process of analyzing the comprehensive benefit of the transformation. Therefore, it's necessary to establish the theory and methods that can handle the evaluation of transferring qualified personnel resource to qualified personnel capital, which is multifactor and of diversified benefit forms.

It is very important to explain the principle of the transferring qualified personnel resource to qualified personnel capital because there are many factors with qualitative information in the process of evaluation. In fact, people usually use the linguistic tool to process qualitative information (Herrera, 2000; Zadeh, 1996; Yang Xu, etc., 2003, 2004).

This paper aims at discussing an evaluation model based on linguistic variable. In this paper, we present a basic mathematics model of transferring qualified personnel resource to qualified personnel capital based on linguistic.

The organization of this paper is as follows. The basic model based on linguistic of transferring qualified personnel resource to qualified personnel capital is introduced in section 2, and this section includes six aspects of contents, such as the process and the model of transferring qualified personnel resource to qualified personnel capital; depiction of social benefit; depiction of economic benefit; depiction of quality; depiction of potentiality; and depiction of the construction of ability. Section 3 is conclusions that explain the advantage of the model based on linguistic and some suggestions of transferring qualified personnel resource to qualified personnel capital.

2. The basic model based on linguistic

What the transform from qualified personnel resource to qualified personnel capital is transferring the quality and ability of personnel resource to economic and

social benefit of qualified personnel capital through a certain social condition, and this process is shown as Fig.1.

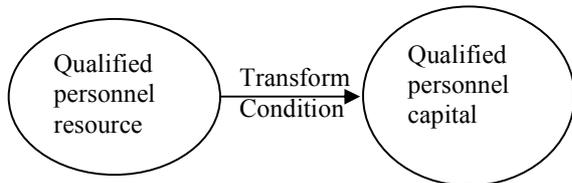


Fig.1: The process of the transferring qualified personnel resource to qualified personnel capital.

The model of transferring qualified personnel resource to qualified personnel capital is shown as Fig.2.

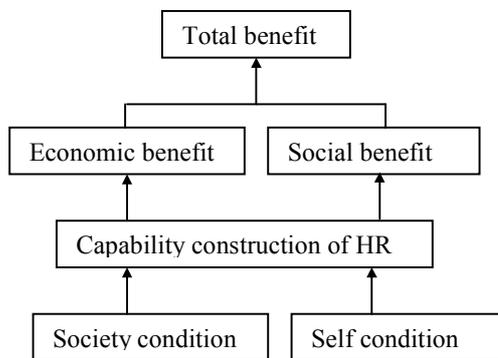


Fig.2: the model of transferring qualified personnel resource to qualified personnel capital.

Suppose (1) Total benefit = S (social benefit, economic benefit).

To study the principle of the transform from qualified personnel resource to qualified personnel capital, normally it can be depicted to solve the following optimization problem:

Goal: Max S (social benefit, economic benefit)
 condition: Subject to: Related to condition. Where, S is a binary monotone increasing (based on the common understanding order, in the same way hereinafter.) linguistic-valued mapping, which can be depicted as follows.

Suppose that (1) The linguistic value sets of evaluation for social benefit and economic benefit are both {little, middling, big}, S can be given by Table 1.

S	Little	Middling	Big
Little	Little	Little	Middling
Middling	Little	Middling	Big
Big	Middling	Big	Big

Table 1: the result of S.

2.1. Depiction of social benefit

Social benefit = S1 (the quantity of qualified personnel capital in social benefit, the quality of qualified personnel capital in social benefit), where, S is a binary monotone increasing linguistic-valued mapping, which can be depicted as follows.

Suppose (1) The linguistic set of the quantity of qualified personnel capital in social benefit is {little, middle, big}. (2) The linguistic set of the quality of qualified personnel capital in social benefit is {bad, fair, good, excellent}.

S1 can be given by Table 2.

S1	Bad	Fair	Good	Excellent
Little	Little	Little	Middling	Middling
Middling	Little	Middling	Middling	Big
Big	Middling	Middling	Big	Big

Table 2: the result of S1

The quantity of qualified personnel capital in social benefit = F1 (quality, potentiality) where, F1 is a binary monotone increasing linguistic-valued mapping, which can be depicted as follows.

Suppose that

(1) The linguistic value set of evaluating quality is {bad, fair, good, excellent}.

(2)The linguistic value set of evaluating potentiality is {little, middling, big}.

F1 can be given by Table 3.

F1	Little	Middling	Big
Bad	Little	Little	Middling
Fair	Little	Middling	Middling
Good	Middling	Middling	Big
Excellent	Middling	Big	Big

Table 3: the result of F1.

The quality of qualified personnel capital in social benefit = F2 (quality, ability).

Where F2 is a binary monotone increasing linguistic-valued mapping, which can be depicted as follows:

Suppose that

(1) The linguistic value set of evaluating quality is {bad, fair, good, excellent}.

(2) The linguistic value set of evaluating ability is {little, middling, big}.

F2 can be given by Table 4.

F2	Little	Middling	Big
Bad	Bad	Bad	Middling
Fair	Bad	Middling	Good
Good	Middling	Good	Very good
Excellent	Good	Very good	Very good

Table 4: the result of F2.

2.2. Depiction of economic benefit

Economic benefit = S2 (the quantity of qualified personnel capital in economic benefit, the quality of qualified personnel capital in economic benefit), Where, F2 is a binary monotone increasing linguistic-valued mapping, which can be depicted as follows.

Suppose that (1) The linguistic set of the quantity of qualified personnel capital in economic benefit is {little, middling, big}. (2) The linguistic set of the quality of qualified personnel capital in economic benefit is {bad, fair, good, excellent}. S2 can be given by Table 5.

S2	Bad	Fair	Good	Excellent
Little	Little	Little	Middling	Middling
Middling	Middling	Middling	Big	Big
Big	Middling	Big	Big	Big

Table 5: the result of S2.

The quantity of qualified personnel capital in economic benefit = F3 (quality, potentiality)

Where F3 is a binary monotone increasing linguistic-valued mapping, which can be depicted as follows.

Suppose

(1) The linguistic value set of evaluating predisposition is {bad, fair, good, excellent}.

(2) The linguistic value set of evaluating potentiality is {little, middling, big}, and F3 can be given by Table 6.

F3	Little	Middling	Big
Bad	Little	Little	Middling
Fair	Little	Middling	Middling
Good	Middling	Middling	Big
Excellent	Middling	Big	Big

Table 6: the result of F3.

The quality of qualified personnel capital in economic benefit = F4 (quality, potentiality) Where F4 is a binary monotone increasing linguistic-valued mapping, which can be depicted as follows:

Suppose (1) The linguistic value set of evaluating predisposition is {bad, fair, good, excellent}. (2) The linguistic value set of evaluating ability is {little, middling, big}. F4 can be given by Table 7.

F4	Little	Middling	Big
Bad	Bad	Bad	Fair
Fair	Bad	Fair	Good
Good	Fair	Good	Excellent
Excellent	Good	Excellent	Excellent

Table 7: the result of F4.

2.3. Depiction of quality

Quality = M₁ (the construction of ability of qualified personnel resource) Where M₁ is a binary monotone increasing linguistic-valued mapping, which can be depicted as follows.

Suppose (1) The linguistic set of the quality of qualified personnel resource is {little, middling, big}, and M₁: {little, middling, big} → {bad, fair, good, excellent} ,

little → fair

middling → good

big → excellent

2.4. Depiction of potentiality

Potentiality = M₂ (the construction of ability of qualified personnel resource)

where M₂ is a binary monotone increasing linguistic-valued mapping, which can be depicted as follows:

Suppose

(1) The linguistic set of the potentiality of qualified personnel resource is {little, middling, big}, and

M₂ {little, middling, big} → {bad, fair, good, excellent} ,

little → fair

middling → good

big → excellent

2.5. Depiction of the construction of ability

Construction of ability=N (social condition, the self's condition).

Where N is a binary monotone increasing linguistic-valued mapping, which can be depicted as follows:

Suppose

(1) The linguistic set of the social condition and the self's condition are {bad, fair, good, excellent}.

N can be given by Table 8.

N	Bad	Fair	Good	Excellent
Bad	Little	Little	Little	Middling
Fair	Little	Little	Middling	Big
Good	Little	Middling	Big	Big
Excellent	Middling	Big	Big	Big

Table 8: the result of N.

The social condition =G (idea, structural metal, mechanism, cultivation, environment)

Where, G is five variables of monotonous linguistic value with increasing that can be depicted as follows:

Suppose that

(1) The linguistic set of the social condition is $A=\{\text{bad, fair, good, excellent}\}$.

(2) The linguistic value sets of evaluating idea is $A1=\{\text{out-of-date, more new, very new}\}$.

(3) The linguistic value sets of evaluating structural metal $A2=\{\text{unreasonable, more reasonable, very reasonable}\}$.

(4) The linguistic value sets of evaluating mechanism is $A3=\{\text{bad, fair, good}\}$.

(5) The linguistic value sets of evaluating cultivation is $A4=\{\text{weakness, fair, mightiness}\}$.

(6) The linguistic sets of evaluating environment is $A5=\{\text{bad, fair, good, excellent}\}$.

And then

$G:A1 \times A2 \times A3 \times A4 \times A5 \longrightarrow A$

(out-of-date, unreasonable, bad, weakness, bad) \mapsto bad

(out-of-date, unreasonable, bad, weakness, middling) \mapsto bad

(out-of-date, unreasonable, bad, weakness, good) \mapsto bad

(out-of-date, more reasonable, bad, weakness, very good) \mapsto middling

(out-of-date, more reasonable, bad, fair, very good) \mapsto middling

(out-of-date, more reasonable, bad, fair, good) \mapsto middling

(out-of-date, more reasonable, bad, fair, middling) \mapsto middling

(more new, more reasonable, bad, fair, middling) \mapsto middling

(more new, more reasonable, fair, fair, bad) \mapsto middling

(more new, more reasonable, fair, fair, middling) \mapsto middling

(more new, more reasonable, fair, fair, good) \mapsto good

(more new, more reasonable, good, fair, good) \mapsto good

(more new, more reasonable, fair, good, good) \mapsto good

(more new, more reasonable, good, mightiness, good) \mapsto good

(more new, very reasonable, good, mightiness, good) \mapsto good

(very new, very reasonable, good, mightiness, good) \mapsto good

(very new, very reasonable, fair, mightiness, excellent) \mapsto good

(very new, very reasonable, good, fair, good) \mapsto good

(very new, very reasonable, good, fair, excellent) \mapsto good

(very new, very reasonable, very good, mightiness, excellent) \mapsto excellent

3. Conclusions

We put forward detailed description using linguistic variables for the structure of evaluation of the transform. The model based on linguistic value presented in this paper can be used to explain the principle of transferring qualified personnel resource to qualified personnel capital. It must be pointed out that the process and the evaluation of the transform are very complex and difficult, so it's useful to study on the actual application according to people's habit of thought.

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