

The Key Elements on Selection of Training Outsourcing

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Abstract

In this paper, we develop a new index system for the selection of training outsourcing. With the new system, we find key elements of the selection of training outsourcing through factor analysis are helpful to improve the accuracy of decisions of the contracting business, which make contracting businesses select the vendor companies to meet their requirements.

Keywords: Training outsourcing, Human resource management, Key element, Factor analysis

1. Introduction

In 21st century, the employee value has become significant to business asset contracture. Therefore, many firms pay a lot to hire a high value staff and organize course for existing staff training to improve their knowledge and skill. Staff training is the main form of human resource development and is also one of the ways to enhance the competitiveness of enterprises, however, simply relying on their own internal resources to train staff has been unable to meet the development needs of corporate human resources. Therefore, many firms prefer to use external training organizations for personnel training, which would reduce cost and improve management efficiency. Such, it is important for a business to concern how they can select or choose an appropriate training organization.

Outsourcing was proposed by Gray Hamel and C. K. Prahalad in 1990, which refers to that enterprises outsourced some important but non-core business functions to professional outsourcing suppliers in order to improve the quality of services and products, short the production cycle and reduce costs, enterprises focus on those business that can create more value to maximize the potential efficiency and enhance the core competitiveness of companies (Lu, 2009). Outsourcing mainly includes production outsourcing, marketing outsourcing, R & D outsourcing and human resource management outsourcing and so on. Training outsourcing as an important form means that enterprise entrust some or all of the training business to the professional training outsourcing provider by the way of bidding and the contract, monitor the entire process of training activities and evaluate the training effect in order to achieve the targets (Xu and Mei, 2007). Training outsourcing generally relates to the training plan, the design of training courses, training time, the choice of methods as well as a lecturer, the assessment and feedback of training effectiveness and so on. Training outsourcing can be a more specialized division of labor, corporate outsourced training business to suppliers, which is very helpful to simply the complexity of management and to improve the core competitiveness of enterprises allowing companies to focus on business advantages and to reduce the cost (Lin, Zhang and Wang, 2008).

From previous literature, exception of risk and motivation of outsource, we do not find any studies on key elements of supplier selection of training outsourcing. In this paper, we will study what kinds of elements which may affect business to select a training outsourcing, which will provide a theoretical knowledge to firms when they looking for a training outsourcing provider

2. Method of Factor Analyses

Factor analysis originated in the early 20th century and was proposed by K. Pearson and C. Spearman to define and measure intelligence by the statistical analysis (Lin and Qian, 2010). According to the internal dependencies of the correlation matrix, factor analysis integrated some variables with intricate relationship to few factors. Factor analysis is statistical method to determine the essence and classification of certain variables by use of different factors. In a word, variables are grouped on the basis of the correlation, so variables within the same group have higher correlation and less correlation within different groups. Each variable represents a basic structure, this basic structure is called factor (Hou, 2010). Therefore, factor

analysis can be used to identify a few potential factors, which hidden in a large number of observed variables.

Generally, we can use variables for factor analysis, its mathematical model is expressed as follows:

We assume several variables, X_i ($i=1, 2, \dots, p$) p , the expression as follows: $X_i = a_{i1}F_1 + a_{i2}F_2 + \dots + a_{im}F_m + \varepsilon_i$ ($m \leq p$)

The second type of expression as follow:

$$\begin{pmatrix} X_1 \\ X_2 \\ \vdots \\ X_p \end{pmatrix} = \begin{pmatrix} a_{11} & a_{12} & \dots & a_{1m} \\ a_{21} & a_{22} & \dots & a_{2m} \\ \vdots & \vdots & \ddots & \vdots \\ a_{p1} & a_{p2} & \dots & a_{pm} \end{pmatrix} \begin{pmatrix} F_1 \\ F_2 \\ \vdots \\ F_m \end{pmatrix} + \begin{pmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \vdots \\ \varepsilon_p \end{pmatrix}$$

$$X = AF + \varepsilon$$

The common factor is unobservable variable such as $F_1, F_2, \dots, F_m$. Their coefficients (a_{ij}) are called factor loading, ε_i is special factor and can not be included by the former several common factors. And, $\text{cov}(F, \varepsilon) = 0$, F, ε_i represents there is no correlation between variables.

Two core issues of factor analysis are how to construct the factor variable and to name explanation, there are four basic steps for factor analysis: (1) determine whether the original numbers of variables is appropriate or not; (2) construct factor of variables; (3) make factor variables have interpretability by using rotation; (4) calculate the score of factor variables (Sun, 2008).

3. Literature Review

Wang and Wang (2007) point out that the main factors about selecting providers included the reputation, financial condition, training experience, relevant documents, recruitment and training, shared values, the relevant data, time and the commitments. Ren and Cun (2008) use AHP on quantitative research on the selection of training contractor and find some factors such as cultural cohesion, motivating force and compatible degrees, staff, customers, contract management, brand, reputation, the recognition of industry, curriculum design, training effects are important for outsource provider selection. Tang, Sun and Gao (2008) establish an index system of selection evaluation of training outsourcing vendor including industry status, reputation, the richness degree of relevant training experience, the proportion of qualified trainers, the completeness of training materials, the level of cross-cultural management, corporate values match, the communication and coordination capacity of the training team, the price level of training and post-training follow-up service. Qing and Deng (2009) studied decision-making selection of training outsourcing provider by using AHP, and they believe

main factors which will affect the decision of selecting training outsourcing are reputation, price, financial condition, professional quality and cultural degree of coupling.

Considering the enterprises actual needs of the outsourcing, suggestions from human resources experts and corporate executives, we in this paper develop a new evaluation system which includes ten indicators to judge whether an enterprise select a proper external resourcing training organization: the quality of training service, cultural degree of coupling, cultural cohesion and driving forces, training skills, the recognition of industry, training experience, the position in the industry, the relevant data, reputation and brand. The new evaluation system emphasize more on characteristics of service and the cooperation between the contracting companies, which can more accurately reflect the focus of the training outsourcers.

4. The Analysis of Key Elements of Training Outsourcing

According to the above ten selection indicators of training outsourcing, we build the Table 1 below following the Likert scale, the scale use five points to score, where one, two, three, four, five respectively represents this indicator is not very important, unimportant, important, more important and most important, the greater score means that outsourcers are more satisfied with the services of training outsourcing supplier. Expert Review Committee compose of human resource management experts, senior executives scored this criterion, and this scale is sent to twenty people to answer, the effective data after the recovery and analysis shown in Table 2:

Table 1. The Selection Criteria of Training Outsourcing and Likert Scale

Indicator code	Supplier selection of criteria of training outsourcing(name of index)	Not very important	unimportant	important	More important	most important
		1	2	3	4	5
<i>X1</i>	The quality of training services					
<i>X2</i>	cultural degree of coupling					
<i>X3</i>	Cultural cohesion and driving forces					
<i>X4</i>	Training skills and experience					
<i>X5</i>	Awareness of the industry					
<i>X6</i>	Teacher resource					
<i>X7</i>	The position in the industry					
<i>X8</i>	The relevant data					
<i>X9</i>	credit					
<i>X10</i>	brand					

Table 2. The Original Data

index number	<i>X1</i>	<i>X2</i>	<i>X3</i>	<i>X4</i>	<i>X5</i>	<i>X6</i>	<i>X7</i>	<i>X8</i>	<i>X9</i>	<i>X10</i>
01	1	5	4	1	1	1	1	1	1	1
02	2	5	5	2	2	2	1	2	1	1
03	4	3	3	3	3	4	1	4	1	1
04	4	3	4	4	4	4	2	4	2	2
05	4	4	3	3	4	4	1	4	1	1
06	4	3	3	3	4	3	2	3	1	2
07	4	4	4	4	3	3	2	4	1	1
08	1	5	3	1	1	1	1	1	1	1
09	4	4	5	4	4	4	2	4	1	1
10	5	4	3	5	4	5	3	5	3	3
11	5	4	3	4	4	4	2	5	2	2
12	5	4	5	4	4	5	3	5	2	2
13	3	5	5	2	1	2	1	3	1	1
14	5	3	4	3	3	3	2	5	2	2
15	4	5	5	3	3	3	2	4	1	1
16	4	4	4	4	5	3	1	4	1	1
17	5	4	4	5	5	5	4	5	4	4
18	5	4	4	2	4	3	1	5	1	1
19	5	4	5	5	4	5	3	5	3	3
20	5	4	4	5	5	5	2	5	1	2

The target of factor analysis extracted few representative factors from the original indicator variables, so it is necessary to test the correlation between the indicator variables before the use of factor analysis, if the correlation is not strong, indicator variables is not suitable for factor analysis (Xu, and Li, 2009). The correlation between variables was verified by KMO and Bartlett's test. The value of the approximate chi-square is 226.757 (Table 3), the degree of freedom is 45, the value of probability is 0.000, the correlation matrix is not a unit matrix, so those variables can be analyzed by factor analysis. KMO is an index to use compared the value of observation indicators with the value of partial correlation coefficient, its value is closer to one, indicating that these variables are more appropriate to use factor analysis (Gong and Zhou, 2010). The value of KMO is 0.740, which means the results of factor analysis are acceptable.

Table 3. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy	.740
Bartlett's Test of Sphericity Approx Chi-Square	226.757
df	45
Sig.	.000

When the main factors were extracted to substitute the information in the original indicator variables, we obtain the cumulative variance and characteristic roots of each component (Table 4). There are three characteristic roots of factors are more than one and respectively called F1, F2 and F3. The explained variance of the first principal component or the contribution rate is 62.82%, the one of the second principal component or the contribution rate is 15.28%, the one of the third principal component or the contribution rate is 11.13%, moreover, the cumulative variance contribution rate of these three principal component is 89.22%, which shown F1, F2 and F3 have covered 90% of content of the raw data with a strong representation.

Table 4. Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
X1	6.282	62.815	62.815	6.282	62.815	62.815	4.424	44.235	44.235
X2	1.528	15.276	78.091	1.528	15.276	78.091	3.191	31.906	76.141
X3	1.113	11.132	89.223	1.113	11.132	89.223	1.308	13.082	89.223
X4	.407	4.069	93.292						
X5	.293	2.931	96.222						
X6	.155	1.550	97.772						
X7	.117	1.166	98.938						
X8	.060	.603	99.540						
X9	.042	.420	99.961						
X10	.004	.039	100.000						

Extraction Method: Principal Component Analysis

To calculate the factor loading matrix by principal component analysis, these data can specify

the load of each factor on each variable, which is the extent (Table 5).

Table 5. Component Matrix

	Component		
	1	2	3
X6	.938		
X4	.922		.136
X1	.900	-.234	.245
X8	.887	-.185	.293
X5	.845	-.307	.171
X7	.828	.468	-.127
X10	.811	.394	-.389
X9	.751	.493	-.363
X2	-.574	.615	.197
X3		.582	.757

Extraction Method: Principal Component Analysis.

a. 3 components extracted.

However, the initial factor loading matrix was carried on orthogonal rotation in order to make coefficient differentiate from zero to one, the rotated factor loading matrix is shown in Table 6 below.

Table 6. Rotated Component Matrix

The evaluation index of training outsourcing provider	Component		
	1	2	3
The quality of training service(X1)	.920	.282	
Relevant data(X8)	.908	.284	
The recognition of industry(X5)	.876	.236	-.126
Teacher source(X6)	.823	.464	
Training skills and experience(X4)	.777	.513	
Cultural degree of coupling(X2)	-.636		.583
credit(X9)	.223	.943	
brand(X10)	.302	.928	-.117
The position of industry(X7)	.397	.863	.131
Cultural cohesion and driving forces(X3)			.955

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations

With factor extraction and orthogonal rotation, we obtain three factors and the loading coefficient of ten indicators is above 0.5. The results of Rotated Component Matrix can make the meaning about factor variables clearer. F1 reflects the quality of training services, the relevant data, the recognition of industry, faculty strength and training skills and experience, so this factor variable is named as professional level. F2 presents reputation, brand and the position in the industry, so this factor variable is named as the overall image. F3 mainly stands for the cultural degree of coupling, cultural cohesion and driving forces, so the variable may be named corporate culture.

5. Conclusions

Specialization and the development of information technology promote more intense market competition; training outsourcing has become one of the inevitable choices for various types of enterprises. However, how to effectively select a proper training outsourcing provider has become significant. With our analysis and studies, we find that the contracting companies mainly take three indicators to select their appropriate training outsourcing providers, see Table 7.

Table 7. Selection Index System of Training Outsourcing

The first level indicators	% of variance explained	The second level indicators	Load factor	score mean
Professional standards	62.815	The quality of training service	0.920	3.95
	0.603	Relevant data	0.908	3.9
	2.931	The recognition of industry	0.876	3.4
	1.550	Teacher resource	0.823	2.15
	4.069	Training skills and experience	0.777	3.35
The overall image	12.276	credit	0.583	4.05
	0.420	Brand	0.943	1.55
	0.039	The position in the industry	0.928	1.65
Corporate culture	1.166	Cultural degree of coupling	0.863	1.85
	11.132	Cultural cohesion and driving forces	0.955	4

In the first column, the first level indicators are classified and named by the rotated factor loading matrix in Table 6. In the second column, % of variance explained is the percentage of the explanatory power for ten indicator variables. In the third column, the second level indicators were obtained by previous comments of selection criteria. The load factor (column 4) presents an index scale comparing the second level indicators to the first level indicators, and derived by factor analysis.

The finding of key elements of the selection of training outsourcing through factor analysis are helpful to improve the accuracy of decisions of the contracting business, which make contracting businesses select the vendor companies to meet their requirements. As the same time, the choice of the key elements contribute to obtain appropriate indicators for enterprises in order to specify the relevant assessment criteria and refer to the different weights of the various indicators, which may be more operational selection and evaluation indicators of training outsourcing provider selection.

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