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Outsourcing Model in Manpower Organizations

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Abstract

In this paper we present an outsourcing model in manpower organization, In particular, the financial implication for outsourcing personnel was considered for the academic staff in a manpower organization. We gave a real life example; our results gave the total cost of financing outsourcing personnel in the organization..

Keywords:outsourcing model, financial implication, academic staff, organization, total cost.

1.0 Introduction

One of the fundamental goals of any organization is growth or survival. It is therefore imperative to employ some strategic human development concepts in order to achieve these goals. Regardless of size, sector and internationalization, business players encounter the necessity to continuously innovate in order to survive and remain in business.

The practice of using external personnel for the purpose of achieving this strategic organizational goal is termed outsourcing. Most privately owned universities in Nigeria rely on outsourcing for senior resource persons. These outsourced personnel enter into the existing system as adjunct staff, contract staff and associate staff to run most of their programmes.

Organizations outsource for personnel for quite a number of reasons [1, 2], some of which are:

(i) Human resource outsourcing can acquire expertise, skills and technologies that are not readily available within the organization.
(ii) Human resource outsourcing can reduce costs through superior provider's performance and provider's lower cost structure.
(iii) Human resource outsourcing can improve credibility and image by associating with superior providers.
(iv) Human resource outsourcing can accelerate expansion by tapping into the provider's developed capacity, processes, and systems.

However, despite the benefits of outsourcing, the practice is not without pitfalls. The disadvantages amongst others [1, 2] are:

(i) Human resource outsourcing can increase employees" insecurity, whether staff will remain in the organization or hired by the agency.
(ii) Human resource outsourcing can compromise the organization's control over the functions that are outsourced.
(iii) Human resource outsourcing can damage morale and motivation as jobs appear to be lost.
(iv) Human resource outsourcing can reduce the organization's learning capability by depleting its skill base.

The pros and cons of human resource outsourcing should be considered when organizations make strategic decisions as to whether or not to outsource functional human resource activities. Most researchers that have worked on outsourcing either explain the process and theories. The reason for human resource outsourcing in the literature is costs reduction among others. However, there is no mathematical model to evaluate the cost implication of human resource outsourcing in an organization. Essentially, we proposed a model to evaluate the financial costs of outsourcing academic staff in a manpower organization. Judit and Dieu [3] reviewed developments in human resource outsourcing in the light of the severe economic recession prevailing since 2007. They established that companies are increasingly outsourcing for human resource in order to cut costs. However, the article is of the view that outsourcing strategy could be viable only in the short term, and that the effectiveness of this strategy is questionable in the long term.

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Saka [3] examined the nature of outsourcing in Nigeria Universities. The reasons for outsourcing and how it can improve University programmes were identified; on the other hand, the paper also discussed how outsourcing can impede University programme effectiveness. However, the paper fails to examine how the gap between these two extremes could be closed. Elmuti et al [4] considered the consequences of outsourcing strategies on employee quality of work life attitudes and performance in an industrial setting. Particularly, the results obtained in the study indicate that the outsourcing strategies had negative impact on the perceived quality of work-life dimensions. However the financial implication of outsourcing to organization's decision was not their main focus but rather it was on human cost.

Manisha and Deepa [1] reviewed articles on human resource outsourcing, the paper makes specific recommendations as regards the process of human resource outsourcing and it's pre-requisites. The article also highlights the fact that the human resource outsourcing should be viewed having the pro's and con's in mind. Nwabueze [5] examined some challenges of human resource outsourcing in Nigerian public sector organizations. The issues and prospects were considered. The findings revealed that the centralized human resource management and training structure of the public sector does not allow for flexibility and the tapping of the huge benefits and potentials of human resource outsourcing. However, it was recommended that proactive policy concerning human capital development that will enable the growth of human resource outsourcing should be put in place. This became necessary because of the problem of inadequate funding which strangles the use of competent and capable service providers.

Ranjana and Syeedun [6] examined Knowledge process outsourcing using India's emergence as a global leader. The paper examined the challenges faced by Knowledge process outsourcing (KPO). India strength lies in the large pool of trained manpower. The future prospects of Knowledge process outsourcing were also highlighted. In particular, the educational sector needs to be examined to strike a balance between demand and supply of knowledge workers. Also, the issues of the quality and quantity of knowledge of workers need to be examined. Dhar and Balakrishnan [7] considered, the risks, benefits and some of the challenges faced in global IT outsourcing. Some of the benefits of outsourcing like lower cost, improved productivity, high quality of personnel to mention a few were considered. However, many challenges and risk associated with IT outsourcing were also identified. The paper also examined a case study of two firms to validate claims made by previous researchers on IT outsourcing. Kosnik [8] examined outsourcing versus in sourcing and develop a topology of the human resource supply chain (HRSC) models that enable comparison of different models for making more informed strategic human resource (HR) outsourcing decision making.

Basically, five generic models were considered. These models were divided into two categories, namely two in sourcing model (local contracting and human resource centralizing) and three outsourcing models (purchasing HR, non-staffing HR, and staffing HR) . However, the relationship between organizational structure and the HR function is a significant variable that has not yet been thoroughly addressed or given adequate attention in past research. For further research, the paper is of the view that account for different HRSC models should be used to address various dependent variables, especially distribution of power and HR competencies in managing HR supply chain and contribution to firms performance.

The study by Elmuti [9] identified current outsourcing strategy trend and practices for randomly selected firms in the United States. The study revealed that organizations generally considered themselves successful at outsourcing. However, while they achieve important improvement in their performance, they have not attained the size of improvement ascribed to outsourcing strategies. Tomas.et al [10] gave a resource-based view of outsourcing and its implications for organizational performance in hotel sector.

Hsu Justine [11] considered the relative efficiency of public and private service delivery of healthcare. The indicator shows that the efficiency level shows inconclusive evidence. The evidence – base used however needs to be expanded so as to measure the inputs and outputs of systems to identify and quantify inefficiency, key causes and constraints, and possible interventions or structural changes to improve performance. Shaimaa El – Fayyoumy et al [12] gave a theoretical approach on measurement of catalyst efficiency in asymmetric chemical reactions. Since there has not been any unifying way of measuring asymmetric catalyst quantitatively until date. The study proposed that a catalyst is more efficient if fewer atoms are utilized to give a product in a required enatiometric excess.

2.0 ASSUMPTIONS OF THE PROPOSED MODEL

(i) Amount payable to outsource staff in grade i varies directly with the number of credit units.
(ii) There is a total fixed cost paid to outsource staff by the organization.
(iii) The difference in the amount payable to outsource staff in the two consecutive grades is constant.
(iv) The number of outsource staff in each grade i may not necessarily be equal.

3.0 Mathematical Notations And Their Meanings

TRCO (R,n) : Total amount used to finance outsourcing personnel in the institution in a session
$[\![n]\!]_i$: number of outsourcing staff in grade i.
n : Total number of outsourcing staff in the organization or institution.
$[\![R]\!]_i$: Total variable cost paid to outsourcing staff in grade i.
h : Highest rank in the institution.
k _i : Fixed cost paid to an outsourcing staff in grade i
K : Total fixed cost paid to outsourcing personnel in the organization.

m_i : Cost paid per unit load to an outsourcing staff in grade i for a course in grade i .
j : Unit load per course, j =1, 2, 3…t
⟦ n⟧_ij : Number of courses in grade i having j units.
t : highest number of unit
m: column vectors h x1 of cost paid per unit course.
G : row vectors of unit load per course.
n=h x t matrix
C=G n^T : a row vector 1 x h
e : a column vector of 1 , of dimension h x 1
Ω=[m(G n^T)]e : column vector of total variable cost paid to outsourcing staff in the different grades.
K=⟦(k_1 n_(1) k_2 n_(2) … k_h n_h)⟧^T= column vector of total fixed cost of the different grades of the organization.

3.1 Model Development

$$TRCO\,(R,n) = K + \sum_{i=1}^{h} R_i \quad (1)$$

where $K = \sum_{i=1}^{h} n_i k_i$
Hence,

$$TRCO\,(R,n) = \sum_{i=1}^{h} n_i k_i + \sum_{i=1}^{h} R_i = \sum_{i=1}^{h} (n_i\, k_i + R_i) \quad (2)$$

But

$$R_i = m_i \sum_{j=1}^{t} j\, n_{ij} \quad , \quad i = 1(1)h \; ; \; j = 1(1)t \quad (3)$$

If there is a natural ordering of the unit load of the available courses in an institution. In other words, there is at least the existence of a 1 - unit course in the institution.
However, in some institutions, a 1-unit course may not exist. If this is the case, equation (3) reduces to

$$R_i = m_i \sum_{j=2}^{t} j\, n_{ij} \quad , \quad i = 1(1)h \; ; \; j = 2(1)t \quad (4)$$

Summarily,

$$R_i = \begin{cases} m_i \sum_{j=1}^{t} j\, n_{ij} \, , & \text{if } j = 1,2,\dots,t \\ m_i \sum_{j=2}^{t} j\, n_{ij} \, , & \text{if } j = 2,3,\dots,t \\ \sum_{j=1}^{t} m_i\, j\, n_{ij} \, , & \text{otherwise} \end{cases} \quad (5)$$

Therefore the variable cost paid to outsourcing personnel in the organization is given by (5)
Generally, total cost of financing outsourcing personnel in an organization is given by

$$TRCO\,(R,n) = \sum_{i=1}^{h} (n_i\, k_i + m_i \sum_{j=1}^{t} j\, n_{ij}) \quad (6)$$

3.2 Condition 1

If the unit load of the courses in an institution follows the order
j = 1,2 , 3,…t then the total cost of financing outsourcing personnel in the institution is given by

$$TRCO\,(R,n) = \sum_{i=1}^{h} (n_i\, k_i + m_i \sum_{j=1}^{t} j\, n_{ij}) \quad (7)$$

3.3 Condition2

If there is no possibility of 1 - unit course, then the total cost of financing outsourcing personnel in the institution is given by

$$TRCO\,(R,n) = \sum_{i=1}^{h} (n_i\, k_i + m_i \sum_{j=2}^{t} j\, n_{ij}) \quad (8)$$

Expand (8) becomes

$$\text{TRCO}(R, n) = \sum_{i=1}^{h} n_i k_i + \sum_{i=1}^{h} m_i \sum_{j=2}^{t} j\, n_{ij} \qquad (9)$$

Table 1. Framework indicates number of courses taught by outsourcing staff in grade i having j credit units.

number of taught courses / grade i	n_{i1}	n_{i2}	n_{i3}	…	n_{it}	$\sum_{j=1}^{t} n_{ij}$
1	n_{11}	n_{12}	n_{13}	…	n_{it}	$\sum_{j=1}^{t} n_{1j}$
2	n_{21}	n_{22}	n_{23}	…	n_{2t}	$\sum_{j=1}^{t} n_{2j}$
3	n_{31}	n_{32}	n_{33}	…	n_{3t}	$\sum_{j=1}^{t} n_{3j}$
4	n_{41}	n_{42}	n_{43}	…	n_{4t}	$\sum_{j=1}^{t} n_{4j}$
5	n_{51}	n_{52}	n_{53}	…	n_{5t}	$\sum_{j=1}^{t} n_{5j}$
6	n_{61}	n_{62}	n_{63}	…	n_{6t}	$\sum_{j=1}^{t} n_{6j}$
7	n_{71}	n_{72}	n_{73}	…	n_{7t}	$\sum_{j=1}^{t} n_{7j}$
⋮	⋮	⋮	⋮	⋮	⋮	⋮
h	n_{h1}	n_{h2}	n_{h3}	…	n_{ht}	$\sum_{j=1}^{t} n_{hj}$
	$\sum_{i=1}^{h} n_{i1}$	$\sum_{i=1}^{h} n_{i2}$	$\sum_{i=1}^{h} n_{i3}$	…	$\sum_{i=1}^{h} n_{it}$	$\sum_{i=1}^{h}\sum_{j=1}^{t} n_{ij}$

Table 2 . Framework indicates total amount of money the organization is using to finance outsourcing personnel in grade i

Variable cost / grade i	$m_i 1\ n_{i1}$	$m_i 2\ n_{i2}$	⋯	$m_i t\ n_{it}$	$R_i = \sum_{j=1}^{t} m_i\ j\ n_{ij}$	$n_i k_i$
1	$m_1 1\ n_{11}$	$m_1 2\ n_{12}$	⋯	$m_1 t\ n_{1t}$	$\sum_{j=1}^{t} m_1\ j\ n_{1j}$	$n_1 k_1$
2	$m_2 1\ n_{21}$	$m_2 2\ n_{22}$	⋯	$m_2 t\ n_{2t}$	$\sum_{j=1}^{t} m_2\ j\ n_{2j}$	$n_2 k_2$
3	$m_3 1\ n_{31}$	$m_3 2\ n_{32}$	⋯	$m_3 t\ n_{3t}$	$\sum_{j=1}^{t} m_3\ j\ n_{3j}$	$n_3 k_3$
4	$m_4 1\ n_{41}$	$m_4 2\ n_{42}$	⋯	$m_4 t\ n_{4t}$	$\sum_{j=1}^{t} m_4\ j\ n_{4j}$	$n_4 k_4$
5	$m_5 1\ n_{51}$	$m_5 2\ n_{52}$	⋯	$m_5 t\ n_{5t}$	$\sum_{j=1}^{t} m_5\ j\ n_{5j}$	$n_5 k_5$
6	$m_6 1\ n_{61}$	$m_6 2\ n_{62}$	⋯	$m_6 t\ n_{6t}$	$\sum_{j=1}^{t} m_6\ j\ n_{6j}$	$n_6 k_6$
7	$m_7 1\ n_{71}$	$m_7 2\ n_{72}$	⋯	$m_7 t\ n_{7t}$	$\sum_{j=1}^{t} m_7\ j\ n_{7j}$	$n_7 k_7$
⋮	⋮	⋮	⋮	⋮	⋮	⋮
h	$m_h 1\ n_{h1}$	$m_h 2\ n_{h2}$	⋯	$m_h t\ n_{ht}$	$\sum_{j=1}^{t} m_h\ j\ n_{hj}$	$n_h k_h$
	$\sum_{i=1}^{h} m_i 1\ n_{i1}$	$\sum_{i=1}^{h} m_i 2\ n_{i2}$	⋯	$\sum_{i=1}^{h} m_i t\ n_{ht}$	$\sum_{i=1}^{h} R_i$	$\sum_{i=1}^{h} n_i k_i$

From Table 2, we have that

$$\sum_{i=1}^{h} R_i = \sum_{j=1}^{t} m_1\ j\ n_{1j} + \sum_{j=1}^{t} m_2\ j\ n_{2j} + \sum_{j=1}^{t} m_3\ j\ n_{3j} + \cdots + \sum_{j=1}^{t} m_h\ j\ n_{hj} \quad (10)$$

(10) implies

$$\sum_{i=1}^{h} R_i = \sum_{i=1}^{h}\left(\sum_{j=1}^{t} m_i\ j\ n_{ij}\right) = \sum_{i=1}^{h} m_i \sum_{j=1}^{t} j\ n_{ij} \quad (11)$$

and

$$\sum_{i=1}^{h} n_i k_i = n_1 k_1 + n_2 k_2 + n_3 k_3 + \cdots + n_h k_h \quad (12)$$

Applying (11) and (12) yields the total cost of financing outsourcing personnel in the organization. given by

$$TRCO\ (R, n) = \sum_{i=1}^{h} n_i k_i + \sum_{i=1}^{h} R_i = \sum_{i=1}^{h} (n_i\ k_i + R_i) \quad (13)$$

3.4 Transformation Of Total Amount Of Money Used In Financing Outsourcing Personnel In An Institution Into Matrix Form

We transformed (13) into the matrix form given by

$$TRCO(R, N) = k n^T e + m(G\ n^T)\ e \quad (14)$$

(14) gives the total amount of money used in financing outsourcing personnel in an institution in matrix form.

$$TRCO(R, N) = [k n^T + m(G\ n^T)]e = K + \Omega \quad (15)$$

$$C = G\ n^T : \text{ a row vector } 1 \times h \quad (16)$$

suppose $C = (c_{1j})$, $j = 1, 2, 3, \ldots, h$ and $m = (m_{i1})$, $i = 1,2,3, \ldots h$

$$m = \begin{pmatrix} m_{11} \\ m_{21} \\ \vdots \\ m_{h1} \end{pmatrix} \quad (17)$$

$$G = (1 \quad 2 \quad 3 \quad 4) \quad (18)$$

$$e = \begin{pmatrix} 1 \\ 1 \\ 1 \\ \vdots \\ 1 \end{pmatrix} \quad (19)$$

$$n = \begin{pmatrix} n_{11} & \cdots & n_{1t} \\ \vdots & \ddots & \vdots \\ n_{h1} & \cdots & n_{ht} \end{pmatrix} (20)$$

$$n^T = \begin{pmatrix} n_{11} & \cdots & n_{h1} \\ \vdots & \ddots & \vdots \\ n_{1t} & \cdots & n_{ht} \end{pmatrix} (21)$$

$$k = \begin{pmatrix} k_1 n_1 \\ k_2 n_2 \\ \vdots \\ k_h n_h \end{pmatrix} \quad (22)$$

By substitution yields

$$TRCO(R,N) = \begin{pmatrix} k_1 n_1 \\ k_2 n_2 \\ \vdots \\ k_h n_h \end{pmatrix} + \left\{ \begin{pmatrix} m_{11} \\ m_{21} \\ \vdots \\ m_{h1} \end{pmatrix} \left[(1 \quad 2 \quad 3 \quad \ldots \ t) \begin{pmatrix} n_{11} & \cdots & n_{h1} \\ \vdots & \ddots & \vdots \\ n_{1t} & \cdots & n_{ht} \end{pmatrix} \right] \right\} \begin{pmatrix} 1 \\ 1 \\ 1 \\ \vdots \\ 1 \end{pmatrix} \quad (23)$$

Applying (19) yields

$$mC = \begin{cases} m_{i1}\, c_{1j}\,, & \text{for } i = j \\ 0 & \text{otherwise} \end{cases} \quad (24)$$

4.0 Numerical Example

Table 3. Cell entries indicates number of courses taught by outsource staff in grade i having j unit credit load.

number of taught courses / grade i	n_{i1}	n_{i2}	n_{i3}	n_{i4}	$\sum_{j=1}^{4} n_{ij}$
Graduate Assistant	2	22	18	0	42
Assistant Lecturer 02	1	23	19	0	43
Lecturer II 03	5	104	68	0	177
Lecturer I 04	5	92	120	16	233
Senior Lecturer 05	1	27	57	8	93
Associate professor	0	26	55	8	89
Professor 07	0	25	55	9	89
	14	319	392	41	$\sum_{i=1}^{7}\sum_{j=1}^{4} n_{ij} = 766$

4.1 Applying Condition 1 : If the unit load of the courses in an institution follows the order j = 1, 2, 3 and 4 then the total cost of financing outsourcing personnel in the institution is given in Table 4.

$$\sum_{i=1}^{7} R_i = \sum_{j=1}^{4} m_1\, j\, n_{1j} + \sum_{j=1}^{4} m_2\, j\, n_{2j} + \sum_{j=1}^{4} m_3\, j\, n_{3j} + \cdots + \sum_{j=1}^{4} m_7\, j\, n_{7j} \quad (25)$$

(25) simplifies to

$$\sum_{i=1}^{7} R_i = \sum_{i=1}^{7} m_i \sum_{j=1}^{4} j\, n_{ij} \quad (26)$$

$$TRCO(R,n) = \sum_{i=1}^{7} n_i k_i + \sum_{i=1}^{7} R_i = 215000 + 52720000 = ₦52935000 \quad (27)$$

4.2 Applying Condition 2: If there is no possibility of 1 unit course taught by outsourcing staff, that is for j = 2, 3 and 4 then the total amount of money used to finance outsourcing personnel in the institution is the model given by equation (9) . The results are given in table 5

Table 5. Total amount of money used to finance outsource staff if there is no possibility of a one unit course taught by an outsource staff in the institution.

$$TRCO(R,n) = \sum_{i=1}^{7} n_i\, k_i + \sum_{i=1}^{7} m_i \sum_{j=2}^{4} j\, n_{ij}$$

$$= 215000 + 52430000 = ₦52645000$$

The entries given by (28) indicate the number of courses taught in grade i having j credit units in an institution. In our own case, the first entry 2 indicates that two courses that are taught by graduate assistance has one unit load, the second entry 22 indicates that twenty two courses that are taught by graduate assistance has two unit load, continuing in that manner, the last entry 9 indicates that nine courses are taught by Professor for a course having four unit load.

$$n = \begin{pmatrix} n_{11} & n_{12} & n_{13} & n_{14} \\ n_{21} & n_{22} & n_{23} & n_{24} \\ \vdots & \vdots & \vdots & \vdots \\ n_{71} & n_{72} & n_{73} & n_{74} \end{pmatrix} = \begin{pmatrix} 2 & 22 & 18 & 0 \\ 1 & 23 & 19 & 0 \\ 5 & 104 & 68 & 0 \\ 5 & 92 & 120 & 16 \\ 1 & 27 & 57 & 8 \\ 0 & 26 & 55 & 8 \\ 0 & 25 & 55 & 9 \end{pmatrix} \quad (28)$$

The entries given by (29) indicate the transpose of the number of courses taught in grade i having j credit units in an institution.

$$n^T = \begin{pmatrix} 2 & 1 & 5 & 5 & 1 & 0 & 0 \\ 22 & 23 & 104 & 92 & 27 & 26 & 25 \\ 18 & 19 & 68 & 120 & 57 & 55 & 55 \\ 0 & 0 & 0 & 16 & 8 & 8 & 9 \end{pmatrix} \quad (29)$$

The entries given by (30) indicate column vectors 7 x 1 of cost paid per unit course in the institution. In our own case, ₦10000 is the cost paid per unit load for graduate assistance, ₦ 15000 is the cost paid per unit load to an assistant lecturer, ₦20000 is the cost paid per unit load to a Lecturer II, ₦ 25000 is the cost paid per unit load to a Lecturer I, ₦ 30000 is the cost paid per unit load to a Senior Lecturer, ₦ 35000 is the cost paid per unit load to an Associate Professor and ₦ 40000 is the cost paid per unit load to a Professor.

$$m = \begin{pmatrix} m_{11} \\ m_{21} \\ \vdots \\ m_{71} \end{pmatrix} = \begin{pmatrix} 10000 \\ 15000 \\ 20000 \\ 25000 \\ 30000 \\ 35000 \\ 40000 \end{pmatrix} \quad (30)$$

The entries given by (31) indicate column vector of total fixed cost paid to outsource staff in grade i, i = 1(1)7. In our own case, a total fixed cost of ₦0 are paid to graduate assistance and assistant lecturer since there is no outsourcing staff in grade 1 and 2, a total fixed cost of ₦ 5000 is paid to a lecturer II since there is one (1) outsourcing staff in grade 3, a total fixed cost of ₦ 20000 s paid to a lecturer I since there are four (4) outsourcing staff in grade 4,. a total fixed cost of ₦ 75000 is paid to a Senior lecturer having fifteen (15) outsourcing staff, a total fixed cost of ₦20000 is paid to associate Professors having four (4) outsourced associate Professors., a total fixed cost of ₦ 95000 is paid to Professors having nineteen (19) outsourced. This brings the total number of outsourced staff in the institution to forty three (43) .

The entries given by (31) indicate the column vector of the total fixed cost paid to outsourcing staff in the organization.

$$K = \begin{pmatrix} 0 \\ 0 \\ 5000 \\ 20000 \\ 75000 \\ 20000 \\ 95000 \end{pmatrix} \quad (31)$$

The entries given by (32) indicate row vectors of unit load per course

$$G = (1 \quad 2 \quad 3 \quad 4) \quad (32)$$

The entries given by (33) a column vector of 1, of dimension 7 x 1

$$e = \begin{pmatrix} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \end{pmatrix} \quad (33)$$

By substitution gives

$$TRCO(R,N) = \begin{pmatrix} 0 \\ 0 \\ 5000 \\ 20000 \\ 75000 \\ 20000 \\ 95000 \end{pmatrix} + \left\{ \begin{pmatrix} 10000 \\ 15000 \\ 20000 \\ 25000 \\ 30000 \\ 35000 \\ 40000 \end{pmatrix} \left[(1 \quad 2 \quad 3 \quad 4) \begin{pmatrix} 2 & 1 & 5 & 5 & 1 & 0 & 0 \\ 22 & 23 & 104 & 92 & 27 & 26 & 25 \\ 18 & 19 & 68 & 120 & 57 & 55 & 55 \\ 0 & 0 & 0 & 16 & 8 & 8 & 9 \end{pmatrix} \right] \right\} \begin{pmatrix} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \end{pmatrix} \quad (34)$$

(34) simplifies to

$$TRCO(R,N) = \begin{pmatrix} 0 \\ 0 \\ 5000 \\ 20000 \\ 75000 \\ 20000 \\ 95000 \end{pmatrix} + \left\{ \left[\begin{pmatrix} 10000 \\ 15000 \\ 20000 \\ 25000 \\ 30000 \\ 35000 \\ 40000 \end{pmatrix} (100 \quad 104 \quad 417 \quad 613 \quad 258 \quad 249 \quad 251) \right] \right\} \begin{pmatrix} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \end{pmatrix} \quad (35)$$

(35) further simplifies to

$$TRCO(R,N) = \begin{pmatrix} 0 \\ 0 \\ 5000 \\ 20000 \\ 75000 \\ 20000 \\ 95000 \end{pmatrix} + \begin{pmatrix} 1000000 \\ 1560000 \\ 8340000 \\ 15325000 \\ 7740000 \\ 8715000 \\ 10040000 \end{pmatrix} = \begin{pmatrix} 1000000 \\ 1560000 \\ 8345000 \\ 15345000 \\ 7815000 \\ 8735000 \\ 10135000 \end{pmatrix} \quad (36)$$

4.4 Discussion Of Results

Cell entries in Table 3 indicate number of courses taught by outsourcing staff in grade i having j credit units. We computed the total amount of money the organization is using to finance outsourcing personnel in the organization. If there is a natural ordering of the unit load of the available courses in an institution, in other words, there is at least the existence of a 1 - unit course in the institution, results of such scenario were given in Table 4. We also computed the

total amount of money the organization is using to finance outsourcing personnel in the organization given that there is no possibility of a 1 - unit course taught by outsourcing staff, the results were given in Table 5 . We also transformed our proposed model given by (13) into (14), The entries given in (14) is the total amount used to finance outsourcing personnel in the institution in a session denoted as $TRCO(R,N)$ given in matrix form. If there is at least the existence of a 1 - unit course in the institution, the results revealed that a total of ₦1000000 is used to finance graduate assistance in the institution in a session, a total of ₦1560000 is used to assistant Lecturers in the institution in a session, a total of ₦8345000 is used to finance Lecturer II, a total of ₦15345000 is used to finance Lecturer I, a total of ₦7815000 is used to finance Senior lecturers, a total of ₦8735000 is used to finance associate Professors, and a total of ₦10135000 is used to finance Professors . However If there is no possibility of 1 unit course taught by outsourcing staff in the institution, the results obtained indicates that a total of ₦980000 is used to finance graduate assistance in the institution in a session, a total of ₦1545000 is used to assistant Lecturers in the institution in a session, a total of ₦8240500 is used to finance Lecturer II, a total of ₦15220000 is used to finance Lecturer I, a total of ₦7785000 is used to finance Senior lecturers, a total of ₦8735000 is used to finance associate Professors, which is equivalent to the cost of financing associate Professors in the previous case since no associate Professor taught a 1 - unit course , a total of ₦ 10135000 is used to finance Professors also equivalent to the cost of financing Professors in the previous case, this is also due to the fact that a 1 - unit course is not taught by Professors under the scenario.

5.0 Conclusion

We have developed a model in which outsourcing in manpower organization shall be analyzed. In particular, the financial implication of outsourcing academic staff was considered. Essentially, we have proposed a model for evaluating the financial implication of outsourcing academic staff in a manpower organization. We gave a real life example and the results obtained indicate an aggregate of ₦ 52935000 is used to finance forty three outsourcing personnel in a session given that there is at least the existence of a 1 - unit course in the institution, However If there is no possibility of 1-unit course taught by outsourcing staff in the institution, a total of ₦52645000 is used to finance forty three outsourcing personnel in the institution in a session, The results also indicates that a positive difference of ₦290000 is realized by applying case 2. This difference indicates a reduction in the cost of outsourcing academic staff in institutions when there is no possibility of 1 unit course taught by outsourcing staff.

Table 4. Variable cost, fixed cost and total cost paid to outsource staff if there is a least the existence of a one unit course in the institution.

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