Implementation of Technology Such As Enterprises Resource Planning (ERP) Through Integration of Human Capital with Quality using Analytic Hierarchical Process (AHP)

P.V.S. Kiran, A. Mohammed Faisal

Abstract: Information technology Such as Enterprises Resource Planning (ERP) supports the processes of electronic human resource management (e-HRM) but it lacks the other factors such human capital and quality in decision making. Human capital is related to the skill and knowledge of employee. Total Quality Management (TQM) is more emphasis on the internal customer that includes the employee within the organization. Human Capital (HC) and Quality can be integrated to improve the quality of the output. Many studies have integrated the Quality with HRM through e-HRM to improve the performances but only a few studies have done for e-HRM with the integration of HC with Quality. The purpose of this study is to implement the e-HRM through the integration of HC with Quality using Analytic Hierarchy Process (AHP). The exploration type of research design to integrate the HC with Quality is analyzed using AHP analysis based on the critical success factors (CSFs). The analysis of AHP is resulted that Employee involvement (EI = 0.234), Training, Education & Learning (TL = 0.234), Quality Measures (QM = 0.146), Performance Appraisal (PA = 0.131) and Quality Factors (QF = 0.096) are selected for implementation of the e-HRM through the integration of HC with Quality. Based on the five CSFs, the conceptual model can be designed for implementation of the e-HRM through the integration of HC with Quality. The conceptual model for implementation of the e-HRM through the integration of HC with Quality needs to be empirically tested.

Keywords : AHP, CSFs, ERP, Human Capital, Quality.

I. INTRODUCTION

Technology Such as Enterprises Resource Planning (ERP) has been a great impact on the reduction of the time taken for processes of electronic human resource management (e-HRM) [1]. Information technology supports the processes of electronic human resource management (e-HRM) at the different level, but it lacks the other factors

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Retrieval Number: B3350129219/2019©BEIESP DOI: 10.35940/ijeat.B3350.129219 Journal Website: <u>www.ijeat.org</u> such human capital and quality in decision making [2]. Total Quality Management (TQM) is more emphasis on the internal customer when compared to external customers. Internal customer includes the employee within the organization. Human capital is related to the skill and knowledge of employee. To improve the quality of the output, the organizations need to have a human capital with the integration of TQM.

The concept of human capital through human resource management (HRM) was integrated with TQM in operations and quality [3]. Then, the later studies are more emphasized on implementation of Human Capital through HRM. The model was developed by the researchers based on the human resource architecture and human capital theory [2]. The usage of human capital was examined through strategic HRM on the performance of the firm [5] and human resource (HR) configuration supported for four employment modes [6]. Some researchers found that the human capital had significantly impacted on the learning and performance [7] and HR structure were important for the development of human capital [8]. Later, human capital was studied for customer interactions in the service organizations [9]. The critical success factors (CSFs) such as organizational performance [10], Employment relationship [11] and leadership with learning [12] were studied with the human capital.

Many studies have integrated the Quality with HRM to improve the performances [13] through e-HRM [1] but only a few studies have done with the integration of Human Capital (HC) with Quality (Tab. 1 and 2). The weights of each CSF using Analytic Hierarchy Process (AHP) [14] can support for integration of HC with Quality. The basic TQM concepts to improve the quality measure [6,15] can be integrated with HC. The purpose of this study is to implement the e-HRM through the integration of HC with Quality using Analytic Hierarchy Process (AHP).

Tab. 1 Literature Survey of CSFs based on the Quality and HC

CSFs	Authors										
COLS	1	2	3	4	5	6	7	8	9	10	
Leadership										*	
Quality	*				*		*				
Factors											





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CSFs	Authors									
COIS	1	2	3	4	5	6	7	8	9	10
Teamwork			*			*				
Continuous Improvement	*									
Employee Involvement	*	*	*	*		*			*	
Training, Education & Learning	*			*	*	*		*		*
Communicatio n			*							
Rewards and Recognition	*			*						
Performance Appraisal	*			*			*	*	*	
Staffing	*					*				
Quality Measures			*	*	*	*	*	*		
Capital Intensity			*							
Productivity			*	*						

Tab. 2 Total no. of CSFs based on the literature survey of Quality and HC

CSFs	Total
Employee Involvement	6
Training, Education & Learning	6
Performance Appraisal	5
Quality Measures	5
Quality Factors	3
Productivity	2
Teamwork	2
Rewards and Recognition	2
Staffing	2
Leadership	1
Continuous Improvement	1
Communication	1
Capital Intensity	1

II. RESEARCH METHODOLOGY FOR ANALYTIC HIERARCHY PROCESS (AHP)

The type of research design is the exploration to implement the e-HRM through the integration of HC with Quality. In order to integrate the HC with Quality, AHP analysis is used for exploration based on the CSFs. Business Performance Management Singapore (BPMSG) is run by Klaus D. Goepel who developed a software that is called as AHP Online System (AHP-OS) to analysis the AHP through web [16]. AHP is analyzed through the following steps:

• Select the CSFs based on the highest number of articles that

was considered by the researchers (Tab. 3)

- Build an AHP model based on the selection of the CSFs (Fig. 1)
- Assessment of an AHP model using AHP-OS
- \circ Input the CSFs that were selected based on the consideration of the researchers
- Perform pairwise comparison based on AHP scale (1-9) for the selected CSFs (Fig. 2)
- O Determine the decision matrix for the selected CSFs (Tab. 4)
- o Determine the normalized weights for each CSF

Tab. 3 Selection of CSFs for AHP analysis based on the highest number of articles

S. No.	CSFs		Total
1	Employee Involvement	EI	6
2	Training, Education & Learning	TL	6
3	Performance Appraisal	PA	5
4	Quality Measures	QM	5
5	Quality Factors	QF	3
6	Productivity	PR	2
7	Teamwork	TW	2
8	Rewards and Recognition	RR	2
9	Staffing	SF	2



Fig. 1 An AHP model for integration of HC with Quality based on the selection of the CSFs



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A - wrt AHP priorities - or B?		Equal	How much more?	
1	● EI	OTL	• 1	0203040506070809
2	● EI	OPA	O 1	● 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9
3	I I	OQM	O 1	●2○3○4○5○6○7○8○9
4	● El	\bigcirc QF	O 1	0203@40506070809
5	● EI	\bigcirc PR	O 1	0203040506070809
6	● EI	OTW	O 1	0203040506070809
7	● EI	\bigcirc RR	O 1	020304@506070809
8	● EI	OSF	Ο1	0203040506070809
9	● TL	OPA	О1	● 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9
10	© TL	OQM	O 1	• 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9
11	● TL	○ Q F	Ο1	○ 2 ○ 3 ● 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9
12	● TL	\bigcirc PR	О1	020304@506070809
13	● TL	OTW	O 1	0203040506070809
14	◉ TL	\bigcirc RR	O 1	0203040506070809
15	● TL	⊖SF	О1	0203040506070809
16	O PA	● QM	Ο1	● 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9
17	PA	OQF	• 1	0203040506070809
18	PA	\bigcirc PR	Ο1	0203@40506070809
19	PA	OTW	O 1	020304@506070809
20	PA	\bigcirc RR	O 1	0203040506070809
21	PA	⊖SF	О1	0203040506070809
22	● QM	○QF	О1	● 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9
23	QM	\bigcirc PR	Ο1	02 • 3 0 4 0 5 0 6 0 7 0 8 0 9
24	QM	OTW	O 1	0203@40506070809
25	● QM	\bigcirc RR	O 1	0203040506070809
26	● QM	⊖SF	O 1	02 • 3 04 05 06 07 08 09
27	QF	\bigcirc PR	О1	• 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9
28	QF	Отw	О1	○ 2 ● 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9
29	QF	\bigcirc RR	O 1	○ 2 ● 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9
30	QF	⊖SF	O 1	○ 2 ○ 3 ● 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9
31	• PR	OTW	О1	● 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9
32	• PR	\bigcirc RR	O 1	• 2 0 3 0 4 0 5 0 6 0 7 0 8 0 9
33	\odot pr	● SF	Ο1	● 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9
34	• TW	ORR	О1	●2 ○3 ○4 ○5 ○6 ○7 ○8 ○9
35	$^{\circ}$ WT $^{\circ}$	● SF	О1	© 2 0 3 0 4 0 5 0 6 0 7 0 8 0 9
36	\odot RR	● SF	О1	© 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9

Fig. 2 Pairwise comparison for the selected CSFs through Web Analysis [16]

Tab. 4 The decision matrix for the selected CSFs

	EI	TL	PA	QM	QF	PR	TW	RR	SF
EI	1	1.00	2.00	2.00	4.00	5.00	5.00	5.00	5.00
TL	1.00	1	2.00	2.00	4.00	5.00	5.00	5.00	5.00
PA	0.50	0.50	1	0.50	1.00	4.00	5.00	5.00	4.00
QM	0.50	0.50	2.00	1	2.00	3.00	4.00	4.00	3.00
QF	0.25	0.25	1.00	0.50	1	2.00	3.00	3.00	4.00
PR	0.20	0.20	0.25	0.33	0.50	1	2.00	2.00	0.50
TW	0.20	0.20	0.20	0.25	0.33	0.50	1	2.00	0.50
RR	0.20	0.20	0.20	0.25	0.33	0.50	0.50	1	0.50
SF	0.20	0.20	0.25	0.33	0.25	2.00	2.00	2.00	1

III. RESULT ANALYSIS

AHP analysis has completed nearly 36 pairwise comparison for the entire CSFs. After the five iterations, the Principle Eigen Value (PEV =9.425) and Consistency Ration (CR=0.037) showed the inconsistency is less for priorities of decision matrix. The AHP analysis (Tab. 5 and Fig. 3) showed the normalized weight of each CSFs for implementation of the e-HRM through the integration of HC with Quality. The normalized weights of Employee involvement (EI = 0.234), Training, Education & Learning (TL = 0.234) are the essential CSFs for implementation of the e-HRM through the integration of the HC and TQM. The normalized weights of Quality Measures (QM = 0.146), Performance Appraisal (PA = 0.131) and Quality Factors (OF= 0.096) are moderately important, but the normalized weight of other Factors (SF = 0. 0.05; PR = 0.045; TW = 0.035; RR= 0.03) is the least important for implementation of the e-HRM through the integration of HC with Quality.



Fig. 3 Consolidated Result of each factor for implementation of the e-HRM through the integration of HC with Quality



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Tab. 5 Normalized Weight and Raking of each CSF for implementation of the e-HRM through the integration of HC with Quality

S. No.	CSFs	Normalized Weight	Rank	
1	Employee Involvement	EI	0.234	1
2	Training, Education & Learning	TL	0.234	1
3	Quality Measures	QM	0.146	3
4	Performance Appraisal	PA	0.131	4
5	Quality Factors	QF	0.096	5
6	Staffing	SF	0.05	6
7	Productivity	PR	0.045	7
8	Teamwork	TW	0.035	8
9	Rewards and Recognition	RR	0.03	9

IV. CONCLUSION

The analysis of AHP is resulted that Employee involvement (EI = 0.234), Training, Education & Learning (TL = 0.234), Quality Measures (QM = 0.146), Performance Appraisal (PA = 0.131) and Quality Factors (QF = 0.096) are the essential CSFs for implementation of the e-HRM through the integration of the HC and Quality, but the normalized weight of other Factors (SF = 0.0.05; PR = 0.045; TW =0.035; RR= 0.03) is the least important for implementation of the e-HRM through the integration of HC with Quality. So the five CSFs such as Employee involvement (EI = 0.234), Training, Education & Learning (TL = 0.234), Quality Measures (QM = 0.146), Performance Appraisal (PA = (0.131) and Quality Factors (QF = 0.096) are selected for implementation of the e-HRM through the integration of HC with Quality. Based on the five CSFs, the conceptual model can be designed for implementation of the e-HRM through the integration of HC with Quality. The conceptual model for implementation of the e-HRM through the integration of HC with Quality needs to be empirically tested.

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