

How Information and Communications Technology Affects the Performance of Human Resources Management in the Higher Education?

Dilber Yousifi¹ and Nabaz T. Khayyat^{2*}

¹Department of Human Resources, University of Kurdistan Hewler, Kurdistan Region – F.R. Iraq, ²Department of Economics and Finance, Kurdistan Business School, University of Kurdistan Helwer, Kurdistan Region – F.R. Iraq

*Corresponding author's email: nabaz.khayyat@ukh.edu.krd

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ABSTRACT

In today's business, effective human resources management (HRM) plays an important role in organizations to cope with competition. Human capital plays a significant role in achieving competitive advantage. Hence, it is recommended for organizations to adapt HRM practices to reach the optimal level of employees' performance. On the other hand, the information and communications technology (ICT) has become the backbone of numerous modern organizations in processing their business operations and activities. HRM has also been affected by the tremendous increase of ICT usage within the organization. The World Wide Web has transformed the human resources practices, for example, human resource planning, recruitment, selection, performance management, work flow, training, and compensation. This paper investigates the impact of ICT on HRM performance in the higher education sector in the Kurdistan Region of Iraq (KRI). In doing so, an empirical study based on survey questionnaire is conducted to gain a clear overview of where the higher education institutions stand in KRI in terms of the usage of ICT in the HRM field. The overall finding is that ICT may have a positive impact on the performance level of HRM staff in the higher education institutions in KRI. Furthermore, the level of ICT usage in KRI is not in a level where the individuals of HRM are well aware of ICT developments and E-HRM as well as the usage of computerized HRM.

Keywords: Human Resources Management, Human Resources, Information and Communications Technology, Kurdistan

1. INTRODUCTION

Human resource management (HRM) is very important in today's business. In the business environment, all organizations face a constant state of competition, and the difference may come from the human capital (Dineen and Allen, 2016). Human capital plays a significant role in achieving competitive advantage for organizations; therefore, it is important and recommended

for organizations to adapt HRM practices to gain the optimum level of employees' performance (Brewster et al., 2016).

Nowadays, information and communications technology (ICT) has become the backbone of numerous modern organizations in processing their business operations and activities (Adewoye and Obasan, 2012; Hakeem, 2013). HRM has also been affected by the tremendous increase in ICT usage within the organization. The World Wide Web has transformed the human resources practices, for example, human resource planning, recruitment, selection, performance management, workflow, training, and compensation.

Many organizations provide worldwide access to different human resources service using ICT; this has resulted in

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a dramatic change in the HRM practices. Organizations are using information management systems in their HR department to gain the supreme services to all of the stakeholders, and most importantly, to reduce administrative procedures for HR professionals (Iwu, 2016).

HRM system or electronic HRM (E-HRM) are built to provide the organizational stakeholders the ability to have accesses to HR information through internet and intranet, to have effective and efficient information in decision-making process (Stone and Dulebohn, 2013).

This article investigates the impact of ICT on HRM performance in the higher education sector in the Kurdistan Region of Iraq (KRI). In doing so, an empirical study is conducted to gain a clear overview of where the higher education institutions stand in KRI in terms of the usage of ICT in the HRM field.

Unfortunately, no study previously has been conducted to investigate the impact of ICT on the HRM-performance in KRI. Therefore, the findings of this study will very likely serve as a first guide to the policymakers of business in general and the Ministry of the Higher Education in particular. In addition, this study will encourage scholars to research in this field of study, through providing more reliable and scientific measurement for describing and assessing the impact of ICT on the performance of HRM and the overall organization's performance.

Furthermore, to policymakers in KRG such as the Ministry of Higher Education, the results of this study will provide invaluable insights and guidelines to monitor the impact of ICT on the performance of HRM within the universities in KRI.

The rest of the paper is organized as follows: Section 2 discusses previous literature relevant to the purpose of this study, section 3 introduces the data and discusses the methodology used, section 4 deals with analysis, and section 5 concludes.

2. PREVIOUS LITERATURE

Many scholars have been attracted and engaged in E-HRM research, targeting two wide domains: (1) HRM and (2) ICT (Adewoye and Obasan, 2012; Agarwala, 2002; Allen et al., 2007; Ardichvili, 2002; Armstrong and Taylor, 2006; Anyim et al., 2012; Tar and Lawrence, 2011).

It is challenging in bringing these two finest descriptive theories together. To bring out interlink between these two areas, ICT is the purpose to support in achieving the overall HRM goals. The goals of E-HRM have been broken down into three types: (1) Cost effectiveness, (2) improving services, and (3) addressing the strategic objectives of the organization. Ruël et al. (2004) have added the fourth goal (4) E-HRM to improve the overall global orientation of human resources management.

Furtmueller (2012) states that for modern organizations to survive, they need to focus and increase competition and globalization, by adopting the cost effective and time efficiency of ICT. According to Sparrow (2010), HR departments within organizations want to implement HR systems that will shift the people related activities to be automated; therefore, the systems to have the ability to provide service to those people without having to go through hands of HR functions. The problems arise when E-HRM is implemented without having the required knowledge of process the implementation of E-HRM, especially if even the consequences and HR functions are not well understood by HR professionals/managers.

In addition, Brewster et al. (2016) put forward four ICT developments that have added success and potential unique competitive advantages for HRM: The advent of shared service thinking, the removal of various intermediaries in the delivery of HR services, the continued adoption of ERP system, and finally, the e-enablement of HR service delivery and more toward self-service models.

3. DATA AND DESCRIPTIVE STATISTICS

As this research is quantitative, a survey questionnaire is considered as the main method of obtaining data. The survey is distributed over the higher education institutions in the region, as they are the main target of the study.

HRM staff members in 13 public universities and 11 private universities have been surveyed for this study [Table A1 in Appendix A].

The population considered for the study was thus limited to the public and private universities in KRI. To ensure a representative sample, the survey questionnaire was distributed in the three governorates, Erbil, Sulaymaniyah, and Duhok., A number of 600 questionnaires, in two different languages English and Kurdish were circulated among 23 universities, in which, 16 universities participated in the survey and 115 usable questionnaires were received.

The median respondent was male for gender, between 26 and 30 years of age, hold a university degree, mainly located in Erbil, on a permanent contract, and was in the middle management level. The frequency distribution and descriptive statistics of the main variables are reported in Table A2 in Appendix A.

The questionnaire consisted of two parts: Part 1 covered questions about respondents' demographic information, and part 2 contained questions about the driving factors of the E-HRM use and the relationship between HRM performance and ICT use. The questions were designed to discover employees' perceptions about HRM performance after incorporating technology in the HR business model (Bourke and Crowley, 2015; García-Morales et al., 2012; Jabbour et al., 2013; Stone et al., 2015).

The questionnaire has been designed in English and Kurdish versions. The English version was first created as it is easier and more convenient to adapt from the original format initiated by Parasuraman et al. (1985). The English version translated into the local language. The questionnaire has been designed in English and Kurdish versions. The English version was first created as it is easier and more convenient to adapt from the original format initiated by Parasuraman et al. (1985). The English version translated into the local language. Appendix B presents the questionnaire where the variables and their scales are included.

4. MODEL SPECIFICATION

The modeling choice technique is primarily based on random utility theory and Lancaster's characteristics theory (Bergmann et al., 2006). The outcomes of the choice experiment, according to McFadden (1974), are modeled in the random maximization utility. The theory of random utility, according to (Hensher et al., 2005), is coming from the perspective of having limited alternatives (discrete). Expecting an individual is following the utility maximum and is rational and making the decision of choosing alternatives that create the highest level of satisfaction, the individuals select alternatives based on the maximum level of utility.

As indicated by Khayyat and Heshmati (2012) and Khayyat and Heshmati (2013), logistic models are used to construct a relationship between a discrete dependent variable and the independent variables. The independent variables are supposed to have an impact on the choice or category, or the choice maker, and represent a priori beliefs about the

causal elements important in the choice or classification process.

The logistic regression can be simply explained following the definition of Train (2009) as follows: A decision maker i needs to make a choice J among a set of alternatives ($j=1, 2, \dots, J$). Each alternative presented to the decision maker will have a utility denoted by U_j . According to the theory of utility maximization, the decision maker will make a choice that leads to her maximum satisfaction. The utility of the n^{th} individual for alternative i can be written as:

$$U_{ni} = \beta'x_{ni} + \varepsilon_{ni} \quad (1)$$

i refers to an identified alternative under consideration from the set of alternatives J , x_{ni} is related to alternatives chosen from the vector of the variables observed. β denotes the estimated parameter of the vectors of the unknown, and ε is a random error which is unknown researcher, but known to the individuals.

The choice of an individual can be explained by an analyst only up to an alternative probability of i being chosen (Hensher et al., 2005). Equation (2) creates forms the probability of selecting the alternative i to be equal to the probability in which the utility of alternative i is greater than or equal to the utility associated with alternative j after it is evaluated every, and each alternative.

$$\text{Probability } i = [(\beta'X_{ni} + \varepsilon_{ni}) > (\beta'X_{nj} + \varepsilon_{nj})] \quad \forall j \in j = 1, 2, \dots, i, \dots, J; i \neq j \quad (2)$$

According to Brown (2003), Equation (2) is the basis of maximum likelihood function estimation to observe the choice pattern that is actually made by the individual. The likelihood function is formed by the assumption of the distribution of the error term $\sum \varepsilon_{ni}$.

The following is the general form of a multinomial logit model (Hensher et al., 2005):

$$\text{Probability } i = \frac{\exp(\beta'X_{ni})}{\sum_{j=1}^J \exp(\beta'X_{nj})} \quad j = 0, \dots, i, \dots, j; i \neq j, \quad (3)$$

β represents the vector of parameters to be estimated, while the vector X represents variables influencing the decision maker.

In this study, an ordered logit model is specified to rank the degree of effectiveness of E-HRM. The model is constructed as functions of the different data characteristics.

To examine how well the model fits the data, the log likelihood ratio test (LR test) is used to compare the model without restriction (the full model) with the model with restriction (the null model). The utility maximization that is subjected to restriction will not imply a larger maximum when it is compared with utility maximization subjected to no restriction (Gujarati, 2004).

In this paper, an ordered logit model is specified to rank the degree of employee's believe of E-HRM effectiveness in the organization's HR operation once the system is adopted. This model is considered a special case of a general model of utility maximization (Green, 2008). The model allows to make inferences and identify the factors affecting employees' decision in choosing the degree of effectiveness.

An assumption is imposed in the model that the control variables consist of a set of individual employee characteristics (demographic information) such as age, income, education, and employment type. These are the same for all the choices regardless of rank chosen. The observational setting is the individual's choice among a set of alternatives, where it is assumed that an individual's characteristics determine his or her choice. The degree of effectiveness denoted by effect has three values 0, 1, 2, 3, and 4 represents (0) strongly disagree, (1) disagree, (2) neither disagree nor agree, (3) agree, and (4) strongly agree, respectively. The full specification is as follows:

$$\begin{aligned} \text{effect}_i = & \alpha_0 + \beta_{Q3}Q3_i + \beta_{Q4}Q4_i + \beta_{Q10}Q19_i + \\ & \beta_{Q20}Q20_i + \beta_{Q35}Q35_i + \beta_{Q36}Q36_i + \\ & \sum_j \beta_{jQ321_{ji}} + \sum_j \beta_{jQ322_{ji}} + \sum_j \beta_{jQ323_{ji}} + \\ & \sum_j \beta_{jQ324_{ji}} + \sum_j \beta_{jQ325_{ji}} + \sum_j \beta_{jQ326_{ji}} + \\ & \sum_j \beta_{jQ327_{ji}} + \sum_j \beta_{jQ328_{ji}} + \sum_j \beta_{jQ329_{ji}} + \\ & \sum_j \beta_{jQ320_{ji}} + \sum_j \beta_{jQ3211_{ji}} + \sum_j \beta_{jQ3212_{ji}} \end{aligned}$$

The category (0) strongly disagree, which is the first option in the questionnaire is selected as a reference group for the dependent variable effect. Q3 represents education and its reference group is the first option secondary, Q4 is the employee's work experience, the first option 1–5 years is the reference group and so on (For details see Appendix B).

To test the fit of the model, the predictive values for the five alternatives: $(8 + 4 + 16 + 40 + 7) / 115 = 65.2\%$, which implies that around 65% of the choices are correctly predicted by the model [Table 1]. For the option (0), the model predicted 80% of the total outcome, 67% for the option (1), 76% for the option (3) and so on.

An LR test is defined as the test statistics: $\lambda = 2(LRu - LRr)$, when LRu is the log likelihood of the model with no restriction, and LRr is the log likelihood of the restricted model. λ follows a Chi-square distribution with degree of freedom which is equal to the number of restrictions imposed by the null hypothesis. The difference between LRu and LRr indicates whether the restrictions are correct or not (Khayyat and Heshmati, 2013).

The LR in this model is 147.2 [Table 2]. With 21 degrees of freedom, it indicates that the effects in the model specification are statistically highly significant at the 99% level of significance. The null hypothesis (the model with the only intercept) is rejected, and the independent variables are jointly significant.

Table 2 presents the ordered logit regression coefficients. The standard interpretation of the ordered logit coefficient is for a one-unit increase in the predictor; the response variable level is expected to change by its respective regression coefficient in the ordered log-odds scale, while the other variables in the model are held constant. Interpretation of the ordered logit estimates is not dependent on the subsidiary parameters; the ancillary parameters are used to differentiate the adjacent levels of the response variable. However, since the ordered logit model estimates one-equation overall levels of the

Table 1: Number of actual and predicted outcomes from the estimated model

Actual alternative ranks	Predicted alternative ranks				
	(0) Strongly disagree	(1) Disagree	(2) Neither disagree nor agree	(3) Agree	(4) Strongly agree
(0) Strongly disagree	8/10 (80%)	0	0	3	0
(1) Disagree	1	4/6 (67%)	3	4	1
(2) Neither disagree nor agree	1	2	16/21 (76%)	10	0
(3) Agree	0	0	2	40/66 (61%)	4
(4) Strongly agree	0	0	0	9	7/12 (58%)
Col. Sum.	10	6	21	66	12

Table 2: Parameter estimates

Variable	Coefficient	P[Z >z]	Mean of X	Variable	Coefficient	P[Z >z]	Mean of X
Constant	2.497	0.000***	-	Q329	0.093	0.473	2.087
Q3	-0.062	0.067**	2.009	Q320	-0.062	0.666	2.243
Q4	-0.154	0.061**	1.174	Q3211	0.116	0.556	2.200
Q321	0.35	0.007**	1.843	Q3212	0.058	0.724	2.174
Q322	0.173	0.052**	1.922	Q351	-0.693	0.000***	1.287
Q323	0.258	0.038**	1.991	Q361	-0.427	0.001***	0.861
Q324	0.315	0.089**	2.122	Q37	-0.845	0.021**	0.826
Q325	-0.105	0.444	2.287	Q71	-0.198	0.515	-0.826
Q326	-0.174	0.236	1.939	Q19	0.54	0.032**	0.722
Q327	-0.118	0.030**	1.983	Q20	-0.066	0.836	0.800
Q328	0.003	0.985	2.061	Q211	-0.033	0.811	1.113

Standard errors are robust. *P<0.10, two-sided test. **P<0.05, two-sided test. ***P<0.01, two-sided test

Threshold parameters for the index

Variable	Coefficient	P[Z >z]
Mu (1)	0.802	0.000***
Mu (2)	1.623	0.000***
Mu (3)	2.895	0.000***

dependent variable, a concern is whether this one-equation model is valid or a more flexible model is required.

The estimates for the logit imply the following:

$$y^* = 2.497 - 0.062Q3 - 0.154Q4 + 0.35Q321 + 0.173Q322 + \dots + \epsilon$$

$$y = 0 \text{ if } y^* \leq 0$$

$$y = 1 \text{ if } 0 < y^* \leq 0.802$$

$$y = 2 \text{ if } 0.802 < y^* \leq 1.623$$

$$y = 3 \text{ if } 1.623 < y^* \leq 2.895$$

$$y = 3 \text{ if } 1.623 < y^* \leq 2.895$$

$$y = 4 \text{ if } y^* > 2.895$$

It is difficult to directly interpret the ordered logit coefficients. Neither the sign nor the magnitude of the coefficient is informative about the result above, so the direct interpretation of the coefficients is essentially vague. To interpret the parameters, one typically refers to the partial effects (marginal effects) in the ordered choice model. The marginal effects give the effects on the specific probabilities per unit change in the regressor.

For example, for the education variable Q3, the marginal effects for the ordered logit model for the five cells of 0.007, 0.011, 0.007, -0.014, and 0.011, respectively, [Table 3], which

give the expected change on the probabilities per additional level of education. For the year of experience (Q4), the marginal effects for the ordered logit model for the five cells of 0.016, 0.027, 0.018, -0.034, -and 0.028, respectively, which give the expected change on the probabilities per additional level of experience either the signs or the magnitudes of the coefficients are directly interpretable in the ordered choice model (Green, 2008). It is necessary, hence, to calculate marginal effects to interpret the model meaningfully. The only certainties in the signs of the marginal effects in this model are as follows, where a variable with a positive coefficient is considered:

- Increases in that variable will lead to increase in the probability in the highest cell and decrease the probability in the lowest cell.
- The sum of all the changes will be zero (The new probabilities must still sum to one.)
- The effects will begin at Pr(0) with one or more negative values, then change to a set of positive values; there will be one sign change.

The reverse is true for a variable with a negative coefficient. Daykin and Moffatt (2002) argue that in psychology applications with attitude scales, “if the statement is one with which most people are either in strong agreement or strong disagreement, it would expect the cut points to be tightly bunched in the middle of the distribution. Thus, in the absence of other information, this suggests that the threshold parameters can reveal some information about the preferences of the respondents (Green, 2008).

5. CONCLUSION AND RECOMMENDATIONS

Due to the limited size of the survey sample, it is difficult to derive precise implications based on the information obtained. However, as it was expected from literature review

Table 3: Marginal effects

Variable	Y=00	Y=01	Y=02	Y=03	Y=04	Variable	Y=00	Y=01	Y=02	Y=03	Y=04
Q3	0.007	0.011	0.007	-0.014	-0.011	Q_320	0.007	0.011	0.007	-0.014	-0.011
Q4	0.016	0.027	0.018	-0.034	-0.028	Q_32E	-0.012	-0.021	-0.013	0.026	0.021
Q_321	-0.037	-0.062	-0.040	0.077	0.063	Q_32T	-0.006	-0.010	-0.007	0.013	0.010
Q_322	-0.008	-0.013	-0.008	0.016	0.013	Q35	0.074	0.123	0.080	-0.153	-0.124
Q_323	-0.006	-0.010	-0.007	0.013	0.010	Q36	0.045	0.076	0.049	-0.094	-0.076
Q_324	-0.033	-0.056	-0.036	0.069	0.056	Q37	0.059	0.126	0.131	-0.110	-0.206
Q_325	0.011	0.019	0.012	-0.023	-0.019	Q7	0.021	0.035	0.023	-0.044	-0.035
Q_326	0.019	0.031	0.020	-0.038	-0.031	Q19	-0.055	-0.079	-0.039	0.104	0.070
Q_327	0.023	0.039	0.025	-0.048	-0.039	Q20	0.007	0.012	0.008	-0.014	-0.012
Q_328	0.000	-0.001	0.000	0.001	0.001	Q21	0.004	0.006	0.004	-0.007	-0.006
Q_329	-0.010	-0.017	-0.011	0.020	0.017						

and proven from the statistical results, there is a positive relationship between the independent variables represent ICT usage and the dependent variable HRM. This suggests that ICT increases the performance of HRM staff. The level of ICT usage is high within HR departments. The HR departments within universities in the Kurdistan region use ICT in their daily activities.

Regardless of the above said, the overall coefficients of all of the responses of the survey are significant. This indicates that ICT has a positive effect to increase the performance of the HRM. This is in line with the findings of the other research (e.g., Di Paolo et al., 2011; Gera and Gu, 2004; Hwang et al., 2004; Karasek, 2015; Ruël et al., 2004; Snell et al., 1995; Stone et al., 2006).

Furthermore, ICT may help increase the level of performance in the higher education institutions in KRI. Based on the responses, most of the higher education institutions in KRI are outsourcing IT. Furthermore, 63% of the respondents replied with the answer of applying IT in their institutions starting the past 5 years. This means that the KRI higher education institutions are still new to IT to be implemented in HRM.

The highest percentage of the responses to E-HRM usage in the higher education institutions is “not being familiar with the E-HRM,” which indicates that the higher education institution staff is not familiar enough with computerized HR. Furthermore, the highest rate of the responses to question whether the HRM practice is automated or not are “not automated at all.” This proves that higher education institutions are not using technology in their HRM system.

To summarize the above points, it can be said that ICT is not being well used in higher education institutions in KRI. To conclude the results, the following points are presented:

- There is a positive relationship between ICT and HRM performance, which means that ICT can have a positive impact on the performance level of HRM staff in the higher education institutions in KRI.
- The level of ICT usage in KRI is moderate; however, it is not in a level where the individuals of HRM are well aware of ICT developments and its link to E-HRM.
- The usage of ICT does help to make the daily tasks much easier according to the survey responses, which results in an increase in the level of performance of the HRM staff in higher education institutions.

Below are the main recommendations that are believed to serve the HRM staff in the higher education institutions in KRI:

- The HRM staff in the higher education institution needs to be well introduced to the ICT to fully understand the usage of ICT and the influence that ICT can have on the HRM-performance.
- ICT can be used in HR process to cut the costs and get the best out of the available staff and reach to the best candidates out in the market to fill out the vacancies available in their institutions.
- Self-service system can be used within the higher education institutions, which can help the organization to always have the up to date information about their employees, which will facilitate the work of HR staff within the organization.
- ICT can be used to facilitate the cooperation and collaboration among the different levels of management which the tasks can be delegated easily, as well as the decisions, can be made automatically while the staff is away or not capable of making a decision.
- ICT can help the institutions with: Finding better employees, creating a flexible encouraging schedule, better data management, conflict resolution, training and development, and information resource.

- As the world is moved toward globalization and organizations tend to get bigger and larger in size, this requires the implementation of E-HRM to help the HRM staff to have up to date and exact information available in the organizations.

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APPENDIX A

Table A1: Names of universities surveyed

Public universities		Private universities	
No	Name	No	Name
1	University of Salahaddin	1	Cihan University
2	Erbil Polytechnic University	2	Ishik University
3	University of Kurdistan Hewler	3	Lebanese French University
4	University of Duhok	4	International University of Erbil
5	Duhok Polytechnic University	5	Hayat Private University for Science and Technology
6	University of Halabja	6	Bayan University
7	University of Garmia	7	Komar University of Science and Technology
8	University of Koya	8	American University in Iraq-Sulaimani
9	University of Raparin	9	University of Human Development
10	Soran University	10	American University of Duhok Kurdistan
11	University of Sulaimani	11	Nawroz University
12	Sulaimani Polytechnic University		
13	University of Zakho		

Table A2: Frequency (demographic variables) of the survey data ($n=115$)

Variable	No. of observations (%)
Gender	
Male	71 (62)
Female	44 (38)
Age	
<=25	14 (12)
26–30	46 (40)
31–35	22 (19)
36–40	16 (14)
41+	17 (15)
Education	
Secondary	11 (10)
Diploma	14 (12)
Degree	53 (46)
Postgraduate	37 (32)
Work experience (in the year)	
1–5 years	52 (45)
6–10 years	29 (25)
11–15 years	12 (10)
16–20 years	6 (5)
21+	16 (14)
Location	
Erbil	77 (67)
Sulaymaniyah	32 (28)
Duhok	6 (5)
Employment type	
Temporary	20 (17)
Permanent	95 (83)
Employment level	
Entry level	17 (15)
Mid-level	61 (53)
Manager level	26 (23)
Director/Top management Level	11 (10)

APPENDIX B: SURVEY QUESTIONNAIRE (ENGLISH)

Section A: Biographical Information (Please tick where appropriate)

1. Q1 Gender
 - Female (.....)
 - Male (.....)
2. Q2 What is your Age (.....)
3. Q3 Highest attained educational level
 - Secondary (.....)
 - Diploma (.....)
 - Degree (.....)
 - Postgraduate (.....)
4. Q4 How many years of work experience do you have?
 - 1–5 years (.....)
 - 5–10 years (.....)
 - 10–15 years (.....)
 - 15–20 years (.....)
 - 20+ (.....)
5. Q5 What is the name of the organization you work for?
6. Q6 Term of employment
 - Temporary (.....)
 - Permanent (.....)
7. Q7 What is your employment level?
 - Entry Level (.....)
 - Mid-Level (.....)
 - Manager Level (.....)
 - Director Level (.....)
 - Top Management Level (.....)
8. Q8 What is your job title?
9. Q9 Monthly salary range (USD)?
 - 1000–2000 (.....)
 - 3000–4000 (.....)
 - 5000–6000 (.....)
 - 6000+ (.....)
10. Q10 Total number of employees in the organization (.....)
11. Q11 In which sector is your organization?
 - Public (.....)
 - Private (.....)
12. Q12 How long the organization you work has been operating?
 - 1–5 years (.....)
 - 5–10 years (.....)
 - 10–15 years (.....)
 - 15–20 years (.....)
 - 20+ (.....)

Section B: Information and communications technology (ICT) and human resources management (HRM) specific information (Please tick where appropriate)

13. Q13 Are your organization's daily HRM operations heavily reliant on computer and IT?
 - Yes (.....)
 - No (.....)

14. Q14 Does your organization have a separate department or division (e.g., Information Systems or Information Technology Department)?
- Yes (.....)
 - No (.....)
15. Q15 Does the organization *outsourcing to receive usage of an information system or information technology?
- Yes (.....)
 - No (.....)
- (*The delegation of specified work to a third party for a specified length of time, at a specified cost, and at a specified level of service).
16. Q16 When did your organization first adopt its major ICT systems(S)?
- Never (.....)
 - In the past 5 years ago (.....)
 - Over 5–10 years ago (.....)
 - 10+ (.....)
17. Q17 Could you please indicate which of the stage of HR technology reflects your organization?
- Stage 1: Paper-based system (.....)
 - Stage 2: Early personal computer (PC) technology (.....)
 - Stage 3: Electronic database systems (.....)
 - Stage 4: Web-based technology (.....)
18. Q18 When did your organization first adopt to ICT system(s) specifically for HRM purpose?
- Never (.....)
 - 0–2 years (.....)
 - 2–5 years (.....)
 - 5+ (.....)
19. Q19 Does your organization keenly track of innovative usage of technology by competitors?
- Yes (.....)
 - No (.....)
20. Q20 Does your organization believe E-HRM application is a strategic need to strive in the industry?
- Yes (.....)
 - No (.....)
21. Q21 To what level does the (higher education ministry, donors, sponsors, and KRG) have the overall operational practices in your industry pressure your organization to adopt E-HRM?
- Low level (.....)
 - Medium level (.....)
 - High level (.....)
 - Never (.....)
22. Q22 Have you ever attended seminars, courses or training programs on the application of ICT in HRM?
- Yes (.....)
 - No (.....) If your answer is no going to question 24
23. Q23 How much specialized hours of training did you receive on the application of ICT in HRM?
- 1–5 (.....)
 - 5–10 (.....)
 - 20–30 (.....)
 - 30+ (.....)
 - None (.....)
24. Q24 Is your organization in the process of adopting (or being trained in) a new ICT that has been deemed essential for its competitiveness?
- Yes (.....)
 - No (.....)

25. Q25 The organization has a wide network of computerized human resource information system with the latest software
 - Yes (.....)
 - No (.....)
26. Q26 What type(s) of IT tool(s) are used to accomplish HR functions? (You may choose more than one)
 - Q261 Application Software (such as DBMS, spreadsheets, and data warehousing) (.....)
 - Q262 Information system software (such as decision support systems and executive information systems) (.....)
 - Q263 Human resources information system which is used by the HR function mainly for specific HR processes (i.e., payroll and performance management) (.....)
 - Q24 All of the above (.....)
27. Q27 Did your organization changes their administration structure to match with IT software system?
 - Yes (.....)
 - No (.....)
28. Q28 Did your organization asks to customize the IT function to match the organization structure?
 - Yes (.....)
 - No (.....)
29. Q29 Which of the following e-HRM and social media technologies or tools are used in your organization specifically for human resources management purpose?

Please tick the appropriate box as follow: (1) Used. (2) Not used. (3) Will be used in the near future. (4) I don't know whether it is used or not. (5) I am not sure what this technology is about.	1	2	3	4	5
Q291 Organization's website					
Q292 Intranet					
Q293 Intranet Blogs only for organization's employees					
Q294 Social Networking Sites such as Facebook, LinkedIn, Myspace, Tweeter, YouTube, etc.					
Q295 Online content communities such as, emails, Slideshare etc.					
Q296 Self-service applications					
Q297 Mobile technology (e.g., Smartphones such as blackberry, I-phone, etc.) that allows employees to access organizations applications and emails					
Q298 Enterprise Resource Planning (ERP) that is connected to other department (i.e., accounting, finance, purchasing)					
Q299 Webinar (adobe webinar, Skype, WhatsApp)					
Q2910 Internet					

30. Q30 Which of the following HRM practices are at least partially automated through your organization's e-HRM system(s)?

Please tick the appropriate box as follows: (1) Not automated at all. (2) A little automated. (3) Moderately automated. (4) Enough automated. (5) Very automated.	1	2	3	4	5
Q301 Staff recruitment and selection (e.g., Job applications, management of advertising, and resumes)					
Q302 Performance evaluation (e.g., personal evaluation files)					
Q303 Internal organization communication (e.g., personal announcements, and newsletters)					
Q304 Communication with third parties outside the organization (e.g., through the organization website: Job announcements, information on the organization's working environment, information on the organization's organizational chart, etc.)					
Q305 Payroll (e.g., preparation, and files)					
Q306 Application forms					
Q307 Career development plan (e.g., organizational chart, and career paths)					
Q308 Time tracking (e.g., personal attendance, absence, and leave)					
Q309 Health and Safety					
Q3010 Document tracking system					

31. Q31 To what degree do the following statements apply to your organization regarding the usage of e-HRM technology?

Please tick the appropriate box as follows: (1) Strongly disagree. (2) Disagree. (3) Neither disagree nor agree. (4) Agree. (5) Strongly agree	1	2	3	4	5
Q311 The individuals who worked with new e-HRM technologies typically exploited their potential to create new uses for them					
Q312 The individuals who worked with new e-HRM technologies reorganized daily tasks in a more effective way					
Q313 The individuals who worked with new e-HRM technologies extended and leveraged their existing competencies on technology by incorporating the new system into their standard job					
Q314 The individuals who were called upon to work with these new technologies continued their work as before without any essential change					
Q315 After adopting and diffusing new e-HRM technologies within the organization, the organization gradually began to operate more effectively than before					

32. Q32 To what extent or degree was the outcome and aftereffects of the new e-HRM technologies implemented?

Please tick the appropriate box as follows: (1) Not at all. (2) Low. (3) Moderate. (4) Enough. (5) Very much	1	2	3	4	5
Q321 Improvement in the quality of HR "deliverables"					
Q322 Reduction of human error in HR "deliverable"					
Q323 Reduction of administrative/operating cost in the HR department					
Q324 Increased the interdependency between HR department and other departments					
Q325 Increase HR productivity and improvement in the speed at which HR department's service was delivered					
Q326 The employees redefine the way they viewed their personal development					
Q327 The employees' engagement and loyalty were increased					
Q328 The employees' satisfaction was increased					
Q329 The paperwork was minimized					
Q3210 Some HR staff found more time to get involved with more strategic work					
Q3211 The organization improved the way it managed knowledge					
Q3212 The organization improved its technology competencies					

33. Q33 When your organization first became interested in the adoption of ICT for HRM purposes, how experienced and knowledgeable in these technologies were your potential users?

- No knowledgeable and experienced (.....)
- Little knowledgeable and experienced (.....)
- Moderately knowledgeable and experienced (.....)
- Enough knowledgeable and experienced (.....)

34. Q34 How easy do you find the IT usage within HRM to navigate?

- Very easy (.....)
- Somewhat (.....)
- Neutral (.....)
- Somewhat difficult (.....)
- Very difficult (.....)

35. Q35 Currently, what is your level of computer usage?

- Low level (.....)
- Moderate level (.....)
- Higher level (.....)

36. Q36 How do you feel the IT has impacted on your tasks compared before the IT was implemented?

- Much easier (.....)
- Somewhat easier (.....)
- No change (.....)
- Somewhat harder (.....)
- Much harder (.....)

37. Q37 Has the e-HRM, in your view, made your role more efficient?

- Yes (.....)

- No (.....)
38. Q38 How satisfied are you with the e-HRM?
- Very satisfied (.....)
 - Somewhat satisfied (.....)
 - Neutral (.....)
 - Somewhat dissatisfied (.....)
 - Very dissatisfied (.....)
39. Q39 Do you believe that E-HRM supports privacy and data security?
- Agree (.....)
 - Disagree (.....)