

e-HRM and employee engagement : a hierarchical study in Indian IT industry

Monica Chauhan Bhadoriya*
Amity Business School, AUMP, Gwalior

Manoj Patwardhan**
ABV-IIITM, Gwalior

Abstract

Electronic Human Resource Management or e-HRM is the involvement of electronic media and information technology (IT) to help mankind in managing human resource management (HRM). This research employs a detailed literature review to identify the drivers of e-HRM in Indian IT industry and finds out whether e-HRM and its determinants are able to classify the level of engagement among the employees of Indian IT Industry. This study is important as to the best of the authors' knowledge, not much study has been done in India in this field.

This research uses the confirmatory factor analysis (CFA) and Multiple Discriminant Analysis (MDA) for analysis. The findings would be important for software companies in assisting them to implement e-HRM effectively and thus to explore the level of employee engagement. The results would also be beneficial to the society by large as using the e-HRM effectively would increase the level of employee engagement and job satisfaction. In addition, the results would be able to help researchers by providing the basis to understand the impact of e-HRM on IT industry.

Keywords: e-HRM, employee engagement, IT industry, CFA, discriminant analysis, MDA

1. Introduction

An organization is successful when not only the financial figures are high but also, it has a workforce which is happy and satisfied. For any organization, the human assets are the profit makers. Therefore, in order to survive and flourish, it is must to have an engaged workforce. In the modern highly globalized economy, there is an urge for loyal talented employees because they are the key elements of the success. Organizations of today understand the role of employee retention and talent management in their success. They know that to withstand today's competition and to sustain their growth in market, retaining talent by engaging employees plays a vital role. They are also focusing on using the newer methods and technologies for the same.

1.1 Background

Organizations today are experiencing high competitive pressure in terms of selection of the quality of employees and then, retaining them. Human resource (HR) is the root of an organization because it is the human resource which plans and acts as per the requirements. The strategies are planned, formulated and executed by

* Corresponding author: monicachauhan.7@gmail.com

** mmp279@gmail.com

the people. Therefore, people or employees are helpful in turning their organization great and successful (Permana et al., 2015). Hence, it becomes important for the organizations to not only retain them but also engage them so that they work for the improvement in organization with a rigorous approach. This process of engaging employees is termed as employee engagement.

According to a recent survey, engaging employees is one of the alarming issues for today's HR personnel (Deloitte, 2015). This fact makes its way because organizations with highly engaged workforces are found to have 147% higher earnings per share than their counterparts and enabled faster recovery from the recession (Gallup, 2013). Employee engagement is thus a practice which is being followed by every organization with utmost care. HR managers are inclined towards using technological tools and methods for engaging employees.

The use of technology in HR department can be extended to be used by whole organization resulting in the interconnection of all other departments with HR. If the HR practices being followed are unfair and not up to the expectations of employees, they may leave them unsatisfied, hinder their performance and thereby push them towards non-engagement towards their role, job and firms. These practices need to be fair and justified in order to keep them engaged. They can be improved by the use of technology such as recruitment and payroll can be integrated, systems can be connected through internet or intranet, user processes can be streamlined, employee recognition and reward management can be tailored without any bias through continuous feedback, employees' voice can be given attention, and so on. One such solution can be turning all the manual HR activities electronic and integrate them.

The use of information technology (IT) in building up the more powerful and beneficial management of HR is taking up its place in almost every industry. Earlier, researchers have stated the importance of IT in HR (Wright and Dyer, 2000; Jäger, 2001; Trapp, 2001; Legnick-Hall and Moritz, 2003; Ruël et al., 2004; Gueutal and Stone, 2005; Lee, 2005). One of such ways to use IT in HR is termed as e-HRM or electronic Human Resource Management. Turning all or most of the divisions of HRM from manual to electronic enhances the working capacity of employees and their efficiency. This electronic version of HRM applications is termed as e-HRM. Thus, the working definition of e-HRM has been proposed as:

“The use of information technology and web-based solutions to connect HR department with the whole organization and to turn all or most of the divisions of HRM from manual to electronic in order to enhance the employees' working capacity and their efficiency.”

1.2 Motivation of the study

The adoption and implementation of e-HRM is prominent in almost every industry. Being an inevitable part of the IT industry, the use of e-HRM here is very important. India is the world's largest sourcing destination for the IT industry, accounting for approximately 67 percent of the US\$ 124-130 billion market. Its revenues (excluding hardware) is estimated at around US\$ 130 billion in FY 2015-16 and is estimated to be at US\$ 154 billion in FY 2016-17 (NASSCOM, 2017). This growth indicates that the Indian IT industry is coping well with the use of technology and hence, has a high scope of giving the effective results of implementing e-HRM.

Although various studies have been done to understand the factors affecting e-HRM, there is a scant research on environmental factors (Bondarouk et al., 2017). This study therefore also focuses on the environmental factors of e-HRM.

A report states that the human resource requirement in the Indian IT/ITES sector is expected to reach 53 lakh by 2022 (Indiastat, 2015). Hence, there is an immense requirement to study employee engagement in this sector.

This study has thus been undertaken within Indian IT industry so that the use of IT, which is the backbone of this industry, can be visualized as a solution to the problem of engaging employees.

1.3 Research objectives

The present study tries to explore the various prevalent factors of e-HRM and their impact on engaging employees in Indian IT industry. Hence, the following research objectives are enlisted:

1. To explore the determinants of e-HRM.
2. To validate the e-HRM model.
3. To find out whether the e-HRM determinants differentiate between the levels of engagement among employees.

The following hypotheses are proposed for this research work:

H1: There is no relationship between the observed variables and their underlying latent constructs.

H2: The population means of all the discriminant functions of e-HRM in all the groups of employee engagement are equal.

2. Literature review

A systematic scan of the database was done in order to find the relevant literature on e-HRM and employee engagement. For employee engagement, articles which were included had the main focus on employee engagement and employee retention. Similarly, articles which were included for e-HRM had the main focus on e-HRM and computer based HRIS. The studies focused on the constituent areas of e-HRM such as e-recruitment, e-compensation etc. were not given much attention for review in this study.

2.1 Employee engagement

To manage human resource has been a concern for ages and has been a matter of research for years. Engaging employees with their work and organization can be a successful weapon in fighting with this problem. Many researchers have given the definition of employee engagement and explained the concept of engaging employees in the organizations.

The very first use of the term 'employee engagement' is given as "the harnessing of organization members' selves to their work roles; in engagement, people employ and express themselves physically, cognitively, and emotionally during role performances" (Kahn, 1990). Later studies suggest many different notions like, a positive attitude held by the employee towards the organization and its values (Robinson et al., 2004), a strategic approach supported by tactics for driving improvement and organizational change (Gallup 2010), a measure of the energy and passion of employees for their organizations (Hewitt Associates, 2004), the degree to which an individual is attentive and absorbed in the performance of their roles (Saks, 2006), individual's involvement and satisfaction with as well as enthusiasm for work (Harter et al., 2009), a positive, fulfilling, work related state of mind that is characterized by vigor, dedication, and absorption (Schaufeli and Bakker, 2004; Welch, 2011), heightened emotional and intellectual connection of an employee with job, organization, managers, co-workers (Gibbons, 2006).

In simple words, to make people enjoy the work they do and hence to make work profitable is what engaging people in work means. Employee engagement is therefore described as a new model or modified version of social contract between the employees and the companies (Smythe, 2007). If an employee is willing to take his organization ahead even if it demands him to dedicate his extra efforts and time, he could be referred to as an engaged employee.

2.1.1 Levels of engaged employees

Researchers have found out that employee engagement is a crucial part of an organization. Specifically, when an employee is new to an organization, it is difficult to make him feel engaged. At this point of time, much attention has to be given to their growth and development to retain them (Bhatnagar, 2007).

Gallup states that employees are measured with respect to engagement in three categories: engaged (work with passion), not-engaged (putting time but not with energy or passion) and actively disengaged (act out their unhappiness). Accordingly, this paper treats them at levels of engagement i.e. high (engaged), medium (not engaged) and low (actively disengaged).

Today, the benefits of advancements in technology are now being leveraged by the HR professionals and managers in order to motivate and engage employees and boost the productivity. Technology when combined with HR practices saves time and cost and also increases effectiveness (Spandana and Munivenkatappa, 2018; Mackay, 2016).

2.2 Electronic human resource management (e-HRM)

The origin of e-HRM lies somewhere in the 1950's when US firms first used it (for their payroll systems) (Fletcher, 2005; Ruël and Bondarouk, 2014). e-HRM is a way of implementing HR strategies, policies, and practices in organizations through a conscious and directed support of and/or with the full use of web-technology-based channels. It is a concept - a way of 'doing' HRM (Ruël et al., 2004). e-HRM is defined as "an umbrella term covering all possible integration mechanisms and contents between HRM and information technologies, aiming at creating value within and across organizations for targeted employees and management" (Bondarouk & Ruël, 2009).

e-HRM is basically connecting staff and managers with the HR department electronically through the HR portal (Bell, Lee, and Yeung, 2006). e-HRM is a web-based solution that takes advantage of the latest web application technology to deliver an online real-time Human Resource Management Solution (Gowan, 2001).

e-HRM also supports innovation as per the demand of customer or influenced by the market conditions. Literature supports this statement and suggests e-HRM to be considered as a means for an organization to innovate itself, both in private and public, in response to the demands and changes in the business (Wahyudi and Park, 2014). On the other hand, it can prove to be irritation in case of lack of goal clarity, misfit e-HRM type or unrealistic results (Ruël et al., 2004).

2.2.1 e-HRM variables

As found out from the review of the earlier work on e-HRM, seven dimensions of e-HRM are mentioned in the following table (Table 1) followed by their context in early studies. These dimensions form the base of our theoretical framework which is described later in this chapter.

Table 1. Conceptualization of variables of e-HRM implementation

S. No.	Variables	Items	Citations
1	Role of HR (HRR)	Change agent (HRR1), Motivator (HRR2), Mentor (HRR3), Leader (HRR4), Communicator (HRR5) Analyst (HRR6), Administrator (HRR7), Advisor (HRR8), Managerial support (HRR9), Training & Development (HRR 10)	Bondarouk et al. (2017), Wahyudi and Park (2014), Parry and Tyson (2011), Kaufman and Miller (2011), Bondarouk and Ruël (2009), Voermans, M. and Van Veldhoven, M. (2007, Gardner et al, (2003), Tansley et al. (2001)
2	Organisational Characteristics (OC)	Strategy (OC1) Size & Structure (OC2) Policies(OC3) Innovative (OC4) Age (OC5)	Bondarouk et al. (2017), Panos and Bellou (2016), Ruël and Kaap (2012), Parry and Tyson (2011), Lin (2011), Kaufman and Miller (2011), Girard and Fallery (2010), Bondarouk et al. (2009), Teo, Soon and Fedric (2007), Florkowski and Olivas-Luján (2006)
3	Environmental characteristics (EC)	Culture change (EC1) External forces (EC2) Competitive actions (EC3) Regulations (EC4) Technological development (EC5)	Bondarouk et al. (2017), Heikkila and Smale (2011), Strohmer and Kabst (2009), Bondarouk and Ruël (2009), Voermans and van Veldhoven (2007), Teo, Soon and Fedric (2007), Strohmer (2007), Olivas-Luján (2007), Ruta (2009)
4	System characteristics (SC)	Standardization (SC1) Reliability (SC2) Robustness (SC3) Interactive (SC4) Response rate (SC5)	Bondarouk et al. (2017), Wahyudi and Park (2014), Tansley, Huang and Foster (2013), Ruël and Kaap (2012), Parry and Tyson (2011), Heikkila and Smale (2011), Bondarouk and Ruël (2009), Haines and Lafleur (2008), Voermans, M. and van Veldhoven (2007), Hooi (2006), Bondarouk et al. (2009), Bell et al. (2006), Gardner et al. (2003), Tansley et al. (2001)
5	User characteristics (UC)	Domain Knowledge (UC1) Technical expertise (UC2) User acceptance (UC3) Intention to use (UC4)	Bondarouk et al. (2017), Tansley, Huang and Foster (2013), Parry and Tyson (2011), Lin L.H. (2011), Kaufman and Miller (2011), Lukaszewski et al. (2008), Voermans, M. and Van Veldhoven, M. (2007), Olivas-Luján et al. (2007), Hooi L.W. (2006), Tansley et al (2001)
6	Perceived Ease of Use (PEOU)	User friendly (PEOU1) Easy to learn (PEOU2)	Bondarouk et al. (2017), Wahyudi and Park (2014), Ruël and Kaap (2012), Nura et al. (2012), Heikkila and Smale (2011), Bondarouk et al. (2009), Voermans and van Veldhoven (2007), Ruël et al. (2004)
7	Perceived Usefulness (PU)	Efficiency (PU1) Intended output (PU2)	Bondarouk et al. (2017), Nura et al. (2012), Heikkila and Smale (2011) , Ruta (2009), Bondarouk et al. (2009), Bondarouk and Ruël (2009), Ruël et al. (2004)

2.3 Employee engagement via e-HRM

Employee engagement has an increased value when with a new technological system and is supported by research in technology implementation and acceptance (Davis, 1989). e-HRM is a new advancement of technology which can be a field of research to increase employee engagement.

As stated earlier, there is a lack of study of the impact of e-HRM on employee engagement, although studies have been undertaken to understand how the use of social media affects employee engagement (Parry and Solidoro, 2014). Social media offers various valuable opportunities to attract and engage young talented individuals (Bissola and Imperatori, 2014).

e-HRM leads to redeployment of unproductive employees in the technology related roles or the roles of their choice in which they feel more engaged (Burbach and Dundon, 2005).

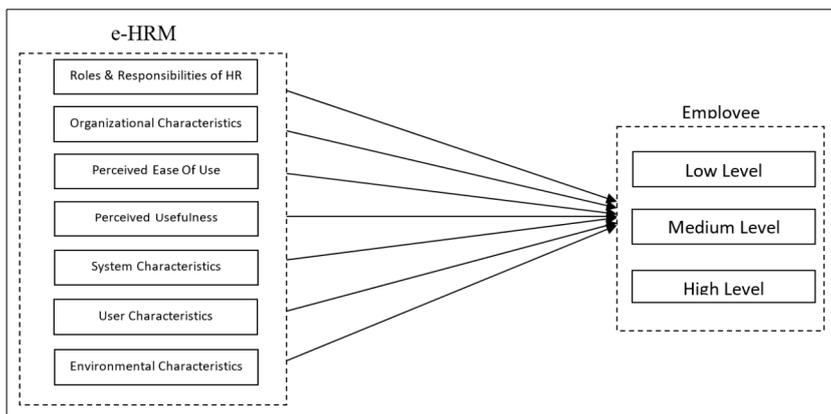
Thus, e-HRM helps to facilitate virtual ‘customer relationships’ and internal labor markets more effectively by increasing the reach and richness of two-way information in applications like employee engagement as it tailors specific ‘employee value propositions’ to small groups of employees, more flexible working to attract people (www.ukessays.com, 2013).

2.4 Theoretical framework

Based on the concepts and dimensions driven by the literature, the theoretical framework of e-HRM and employee engagement is proposed in this study (Figure 1). This framework tells about seven dimensions of e-HRM identified through literature review.

This framework tries to understand the impact of each dimension of e-HRM on employee engagement (EE) and also shows that e-HRM can differentiate between the three levels of engagement.

Figure 1. Theoretical framework



Source: Author

3. Research methodology

This study is exploratory/ descriptive in nature with survey being used as research design which is undertaken with the scope of exploring the impact of e-HRM on employee engagement.

The determinants of e-HRM are explored through a rigorous literature scan and the employee engagement variables are adapted from the Gallup organization's Gallup Q12. The study is further supported by quantitative analysis.

3.1 Sampling

The survey questionnaire was designed in two parts which comprised of 33 variables of e-HRM with a 7-point Likert scale (1- Strongly agree and 7- Strongly disagree) and 12 variables of employee engagement as per the Gallup Q12 with a 5-point Likert scale (1- Strongly agree and 5- Strongly disagree). The questionnaire was distributed to the employees of the top five IT companies of the Indian IT industry who are either responsible for the e-HRM implementation/ adoption and/or the users of e-HRM. The mode of survey was e-mail which was sent to the team leaders for forwarding it to the team members.

The sample size in the present study is 392. The pilot data was analyzed by exploratory factor analysis (EFA) using Statistical Package for Social Sciences Program (SPSS) 23.0 to identify the factors of e-HRM. Seven factors were obtained as a result which are used to form the theoretical model for this study. The model of e-HRM was analyzed by confirmatory factor analysis (CFA) using Analysis of a Moment Structures (AMOS) 22.0 for confirmation of factors and their impact on main construct.

The data obtained from the employee engagement questionnaire was restructured as ordinal data to classify the samples in three groups. The score for each respondent (range: 12-60) was summated and then classified as low engagement (score range: 12-27), medium engagement (score range: 28-44) and high engagement (score range: 45-60).

The relationship between e-HRM and the levels of engagement was analyzed by Multiple Discriminant Analysis (MDA) for developing a linear combination or discriminant function of dimensions of e-HRM and engagement levels.

3.2 Statistical tools

3.2.1 Exploratory factor analysis (EFA)

Exploratory factor analysis (EFA) is a statistical technique used to reduce data to a smaller set of summary variables. It is used to identify the structure of the relationship between the variable and the respondent (www.statisticssolutions.com, 2015). The pilot data was tested using EFA and the resultant factors were used for further analysis. Principle component factor analysis method is used for driving minimum number of factors.

3.2.2 Confirmatory factor analysis (CFA)

Confirmatory Factor Analysis (CFA) is the measurement model used to test the goodness of fit of the measurement scale (Gerbing and Anderson, 1988; Fornell and Larcker, 1981). The purpose of the measurement model is to specify the relationships between observed variables and latent variables. Higher order factor analysis enforces a more parsimonious structure to account for the interrelationships among the factors established by the lower order CFA. The goal of a higher order factor analysis is to provide a more parsimonious account for the correlations among the lower order factors.

The model fit was assessed using CMIN/DF, goodness-of-fit index (GFI), the comparative fit index (CFI), root mean square error of approximation (RMSEA) and adjusted goodness-of-fit index (AGFI). The threshold for CMIN/DF should be less than 3.0 or less than 2.0 in a more restrictive sense (Byrne, 1989). Values of GFI, AGFI and CFI should be over 0.90 (Hair et al., 2010). Moreover, RMSEA should be lower than 0.05 to indicate a close fit of the model about the degree of freedom (Hair et al., 2010; Bentler, 1990). When all or most of the

fit indices did not indicate an acceptable level of fit, the model modified until the fit indices achieved an acceptable level.

3.2.3 Multiple discriminant analysis (MDA)

Multiple discriminant analysis is a statistical technique for analyzing data where the dependent variable (here, employee engagement) is categorical (low level, medium level and high level) and the independent variable (here, e-HRM) is interval scaled. It develops a linear combination of independent variables that discriminates best between groups (of dependent variable) on the value of a discriminant function (Bajpai, 2011). It is used to classify an observation into one of several a priori groupings dependent upon the observation's individual characteristics.

The primary objective of MDA is to classify and/or make predictions in problems where the dependent variable appears in qualitative form, e.g., male or female, bankrupt or non-bankrupt. The primary advantage of MDA in dealing with classification problems is the potential of analyzing the entire variable profile of the object simultaneously rather than sequentially examining its individual characteristics. Another advantage of MDA is that it can decrease the analyst's space dimensionality from the number of different independent variables to $K-1$ dimension(s), where K equals the number of original a priori groups. Assuming there are n groups, then the discriminant function of the group i is as follows:

$$D_i = b_i + b_{i1}x_1 + b_{i2}x_2 + \dots + b_{in}x_n$$

where x_j = discriminant variable, b_{ij} = discriminant coefficients, and b_i = constant term.

4. Result and discussion

4.1 Exploratory factor analysis (EFA)

Explorative factor analysis was used to identify the seven determinants of e-HRM. Initially, 40 items were taken, based on the literature. Due to the combination of low inter-item correlations and low communalities (<0.40), two items were removed. The Kaiser-Meyer-Olkin measure of sampling adequacy was found to be 0.904, which suggests that the responses given with the sample were adequate (Table 2) The same table shows that the Bartlett's Test Of Sphericity is significant ($p = 0.000$). This suggests that correlation matrix is not an identity matrix. Table 2 shows the total variance explained.

Table 2. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.904
Bartlett's Test of Sphericity	Approx. Chi-Square	7828.180
	Df	780
	Sig.	.000

Table 3. Total variance explained

Factors	Variance Explained(Cumulative % 63.329)
HRR	14.738
OC	10.489
EC	7.915
SC	7.699
UC	7.197
PEOU	6.211
PU	4.858

4.2 Confirmatory factor analysis (CFA)

The measurement of the validity of the variables is important before analyzing their relationships i.e. to check if the variables measure appropriately what they are intended to measure. For doing so, this study investigated the loadings of the items, composite reliability (CR) which gives the internal consistency value of latent constructs (Henseler et al., 2009) and average variance extracted (AVE) to assess the convergent validity of the model as follows (Fornell and Larcker, 1981):

- $CR = \frac{\text{sum of SRW (standardizes regression weights) estimate squared}}{\text{sum of SRW estimate squared} + \text{sum of error variance}}$
- $AVE = \frac{\text{Sum of SRW Estimate Squared}}{\text{Number of Variable Items}}$

All the 33 items have confirmed a loading value above .50 which is the threshold value (Hair et al., 2010). For each latent construct, $CR > 0.6$ and $AVE > 0.5$ (Table 4) i.e. satisfying the threshold values (Bagozzi, 2011), except UC and PU for which $AVE < 0.5$ but near 0.5. Hence, the results can be generalized for all but these two characteristics. Thus, the measurement model was found to be reliable and holding convergent validity.

The absolute fit statistics showed a chi-square of 903.644 with 474 (df) was significant ($p = 0.000$). Model fit statistics are shown in Table 5 which shows that the proposed model was fit for the obtained data. The correlation among the constructs was below the threshold limit that confirmed discriminant validity. All observed variables loaded to their corresponding construct. As there were no cross-loadings of variables, unidimensionality of the model was established.

Table 4. Construct reliability and average variance extracted (e-HRM)

S. No.	Factors	C.R.	A.V.E.
1	Role of HR (HRR)	0.972	0.573
2	Organisational Characteristics (OC)	0.958	0.544
3	Environmental Characteristics (EC)	0.976	0.557
4	System Characteristics (SC)	0.906	0.569
5	User Characteristics (UC)	0.897	0.400
6	Perceived Ease of Use (PEOU)	0.651	0.530
7	Perceived Usefulness (PU)	0.665	0.380

Table 5. Model fit statistics (e-HRM)

Fit Index	Recommended Value	Observed Value	Overall Model Fit
CMIN/degrees of freedom	≤ 5.0	1.906	Good fit
GFI	≥ 0.90	0.878	Acceptable
AGFI	≥ 0.80	0.855	Good fit
NFI	≥ 0.90	0.833	Acceptable
CFI	≥ 0.90	0.912	Good fit
RMSEA	≤ 0.08	0.048	Good fit

The absolute fit statistics showed that the value of chi-square is 903.644 with degrees of freedom, $Df = 474$ which was significant ($p = 0.000$). The discriminant validity of the model is ascertained as the correlation among the constructs was below the threshold limit i.e. less than 0.85 (Kenny, 2016). The 33 observed variables loaded to their corresponding construct and also, no cross-loadings of variables was observed. The factor loading of each of the 33 variables was more than 0.5. The factors which had factor loading less than 0.5 were removed. Hence, unidimensionality of the model was established (Nazim and Ahmad, 2013).

The findings showed that all the determinants are positively and significantly related to e-HRM except two variables (standardization and interactive e-HRM) of system characteristics which are significant but negatively related to e-HRM and user characteristics which do not have higher significance. This may be due to the samples taken from software industry where users are technically sound and their experience and skills do not allow them to use a system which is lacking high technology. PU is surprisingly showing less significance but both PEOU and PU have a positive impact on e-HRM. The results are consistent with early and recent studies which suggest that organization, HR and the quality of system: all play a protagonist role towards e-HRM (Tansley et al., 2001; Ruël et al, 2004, Lin, 2011; Bondarouk et al., 2017, Nagendrababu & Girisha, 2018).

4.3 Multiple discriminant analysis (MDA)

The number of discriminant functions is equal to the number of discriminating variables; if number of groups is more than variables else it is 1 less than the number of levels in the grouping variable. In this study, employee engagement has three levels and discriminating variables are seven, so two functions are there.

The Eigen values (Table 6) exhibit, for the first function, the magnitudes of the eigen values is 1.088 and

the percentage of variance explained by this function is 93.6 which is the discriminating ability of this function. High value is recommended for a strong function. Similarly, for the second function, the eigen value associated is .077 which accounts for 6.6 percentage of explained variance. Percentage (%) of variance specifies the percentage of variance explained by the variables in the function. This is calculated as the proportion of the function's eigen value to the sum of all the eigen values. A large value of canonical correlation shows high discriminating ability of the function.

Table 6. Eigen values (e-HRM)

Function	Eigen Value	%of Variance	Cumulative %	Canonical Correlation
1	1.088 ^a	93.4	93.4	.722
2	.077 ^a	6.6	100.0	.268

a. First 2 canonical discriminant functions were used in the analysis

Wilk's Lambda was significant which means that the group means vary significantly. This shows the proportion of total variance in the discriminant scores which is not explained by the differences among the groups. A small value is recommended for apparently different group means. Chi square's high value shows that the functions differ significantly from each other. Table 7 on the next page shows the values for Wilk's Lambda, Chi-Square, etc. In this table, under 'Test of Functions', '1 through 2' indicate that no function has been omitted and '2' means when the first function is removed (Bajpai, 2011). In both cases, $p = 0.000$ i.e. p-value is significant or both functions taken together as well as the second function alone contribute significantly to the difference among groups.

Table 7. Wilk's Lambda (e-HRM)

Test of Function(s)	Wilk's Lambda	Chi-square	df	Sig.
1through 2	.445	312.944	14	.000
2	.928	28.771	6	.000

Table 8 shows the standardized canonical discriminant function coefficients which are used to calculate the discriminant score.

Table 9 gives structure matrix which shows the structured correlations (canonical loading or discriminant loading) of the discriminant functions. It represents the correlations between the observed discriminating variables and the dimensions created with the unobserved discriminant functions. The correlation value is directly proportional to the importance of the corresponding predictor (Bajpai, 2011).

Table 10 shows the functions at group centroids. These are the values of group means for each function calculated by putting the variable means for each group in the discriminating equation. 'Low' group has the higher value on Function 2 (predominantly associated with PEOU, PU, EC and UC). Low engaged employees consider higher PEOU, PU, EC and UC.

Table 8. Standardized canonical discriminant function coefficients (e-HRM)

Variables	Function 1	Function 2
HRR	.263	.357
OC	-.236	.256
EC	-.075	-.140
SC	.898	-.117
UC	-.026	-.479
PEOU	-.038	.509
PU	.010	.433

Table 9. Structure matrix (e-HRM)

Variables	Function 1	Function 2
SC	.917*	.012
OC	-.406*	.294
HRR	.276*	.154
PEOU	.044	.625*
UC	-.102	-.589*
PU	.068	.536*
EC	-.085	-.276*

Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions
Variables ordered by absolute size of correlation within function.

* Largest absolute correlation between each variable and any discriminant function

Table 10. Functions at group centroids (e-HRM)

Level	Function 1	Function 2
Low	-1.065	.011
Medium	.967	-.325
High	1.080	.465

Unstandardized canonical discriminant functions evaluated at group means

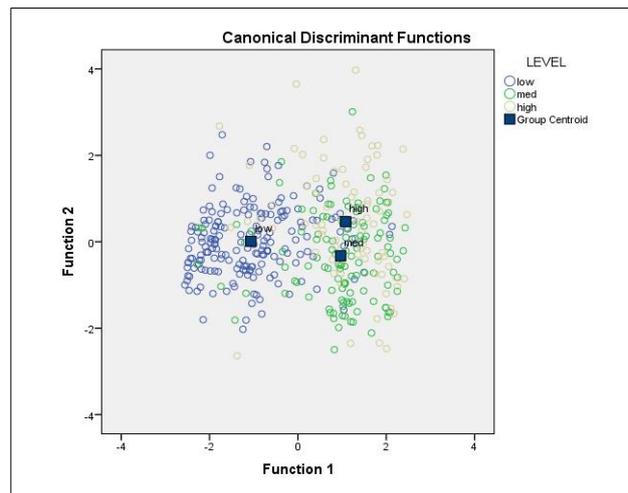
The percentage of original cases correctly classified is 68.1 which are satisfactory, shown in Table 11 below and hence this analysis can be relied on.

Table 11. Classification results^a (e-HRM)

In terms of	Level	Predicted Group Membership			Total
		Low	Medium	High	
Original Count	Low	159	13	19	191
	Medium	14	66	41	121
	High	8	30	42	80
Percentage (%)	Low	83.2	6.8	9.9	100.0
	Medium	11.6	54.5	33.9	100.0
	High	10.0	37.5	52.5	100.0

a. 68.1% of original grouped cases correctly classified.

Figure 2. Graph of individuals on discriminant dimensions



As it is visible from Figure 2, the low engaged employees tend to be at the more negative end of horizontal dimension (Function 1) and medium/ high engaged employees tend to be at the opposite end. On vertical dimension (Function 2), the results are not clear but the high engaged employees tend to be higher as compared to medium engaged employees.

The result shows that proportion of low engaged employees is much higher than highly engaged ones which are well supported by the reports of NASSCOM (Nasscom, 2015). Also, employees standing beneath the umbrella of medium engaged level are higher than those highly engaged, but less than low engaged. They are the ones have the potential to reach higher engagement level if proper measures are taken.

Both the discriminant functions are significant ($p < 0.05$) and hence, both the functions are able to classify between the segments. Results show that 'system characteristics' contribute most in differentiating between group 1 (low) and group 2 (medium) / group 3 (high) to the employee engagement, followed by the 'role of HR manager'. It suggests that employees are possibly more lured to the characteristics of the e-HRM system being used in the firm than the HR efforts. These findings are in line with the results reviewed and suggested by earlier

researches (Bondarouk et al., 2017). The factors adapted from TAM i.e. PEOU and PU contribute most in differentiating between group 2 and 3 which is a little surprising because these factors play a little role in discriminating between low engaged and medium/highly engaged towards employee engagement. However, the results are in line with recent study (Sivapragasam & Raya, 2017; SHRM, 2017; Bondarouk et al, 2017). The employees who are not engaged do not consider usability to be very important contributing factor and the system being easy to use falls on negative side, possibly because the employees from IT industry are well conversed with technology and ease of use may be perceived as technically not so high. These factors have already been suggested not to be very significant (Heikkilä and Smale, 2011; Suhasini & Kalpana, 2018).

5. Conclusion

The main contribution of this paper is as follows:

- Confirming the e-HRM model for its various determinants including environmental factors in addition to organisational and system factors in the IT industry.
- Finding out the impact of e-HRM on the levels of employee engagement in the IT industry.
- Finding out the impact of seven determinants of e-HRM on the levels of employee engagement in the IT industry.
- Finding out the difference in employee engagement across the top 3 Indian IT firms.

5.1 Implications

The results have major implications on IT industries as e-HRM effectiveness is of great importance for budding industrialists. e-HRM provides new phenomenon for the IT companies. The very first implication of this study is thus on IT industries as e-HRM effectiveness is of great importance for budding industrialists. Moreover, engaging employees has been a matter of concern for software industries not only in India but all over the world. This research would help to understand the classification of high engaged, medium engaged and low engaged employees based on the e-HRM application.

The researchers can also find the results important for having in-depth understanding of the determinants of e-HRM effectiveness and the impact of e-HRM on the levels of employee engagement which may form the basis of future research in the field of both e-HRM and employee engagement. The results would also help academicians to develop a better knowledge base of e-HRM and employee engagement which would further lead towards a better skill set. The societal implications are also important as the results would help in higher engagement level among the employees if the attributes are taken care of accordingly.

The HR managers in IT industries can practically apply the results in their respective firms to assess and improve the engagement level of their employees. e-HRM system is not a new concept for IT firms. All the major IT firms today use e-HRM for automating HR activities and connect to the whole organization. The results of this study can be helpful when e-HRM is used as an indicator of employee engagement. Today, HR managers need to engage employees on priority. All the HR activities are automated with the help of e-HRM.

Hence, according to this study, two interpretations can be made:

1. If the implementation of e-HRM is done considering the seven determinants of e-HRM, the e-HRM would be implemented successfully i.e. the employees would be able to work with e-HRM effectively and efficiently. This would lead to contented and engaged employees.
2. e-HRM and its determinants are able to discriminate between the levels of engagement in a company. Hence, e-HRM can also act as an indicator for assessing the engagement level of an employee.

5.2 Limitations and future scope

The study is limited to the top five companies of Indian IT industry, and hence the results may vary for the beginners in this industry. The results need to be checked for other industries as well as other geographical locations. The future scope in the research can be to use the results for further analyzing the impact on other variables like various levels of job satisfaction. Also, the effect of skills and experience could be a good medium to understand the levels of engagement.

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