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Multi-dimensional Perspective of e-HRM: A Diagnostic Study of Select Auto-component Firms

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Abstract

Electronic Human Resource Management has brought about a paradigm shift in the way operational, relational and transformational functions of HRM are performed. Most of the companies across the globe have digitized their HR practices of recruitment, selection, training, performance management, compensation management, leave and attendance management, time management and other operative and strategic functions either through adoption of integrated software applications like SAP or Oracle People soft, or through adoption of standalone applications like Applicant Tracking System, Recrumax, Learning Management System, Payroll, Performance Management Suite and so on. Through this study an effort was made to analyze the effectiveness of e-HRM in auto-component industry from multi- dimensional perspective. e-recruitment, e-selection, e-learning, e-performance management and e-compensation management are the five core dimensions of e-HRM considered for the study. A research premise was developed and tested based on the opinion survey of around 110 HR practitioners at Senior and middle levels of management from 44 select auto-component firms. The findings explicate that technology integration with HR practices in auto-component industry is yielding significant benefits to the firms in the form of reduced cost per hire, increased applicant volume, and enhanced quality, simplified processes, reduced cycle-time of HR and many others which are discussed in detail in this paper.

Key Words: e-HRM, Technology integration, multi-dimensions of e-HRM, Efficiency gains.

INTRODUCTION: Multidimensional Perspective Of E-HRM

The possibilities of integrating digital technological applications with HRM are endless. Electronic technology can be integrated with almost all the processes of HR. The effectiveness of electronic technological applications in HR processes and the value they generate to organizational performance enhancement can be better assessed by analyzing in isolation, the contribution of each of its dimensions to organizational performance. The various dimensions or aspects of e-HRM include: e-recruitment, e-selection, e-learning, e-performance management, e-compensation management, e-leave management, e-time management, e-surveillance, e-attendance

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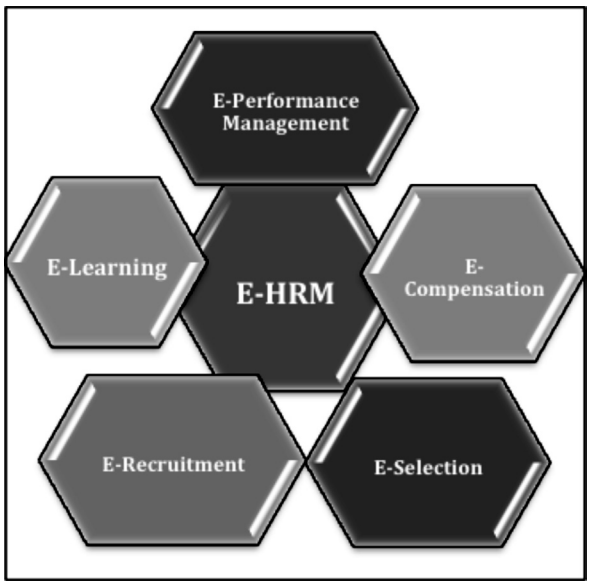
management, etc. Electronic or web-based technology can be leveraged to deliver HR solutions that bring about convergence in HR processes of recruitment, selection, training, evaluation, compensation and all other activities of HR which facilitate the implementation of business strategies. In subsequent paragraphs five dimensions of E-HRM are discussed separately.



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A) e-Recruitment:

Organizations across the globe have started using e-recruitment sources so as to attract and retain highly talented employees.

E-recruitment may be defined as the extensive use of electronic technology or web-based technological tools to assist the recruitment process of an organization.

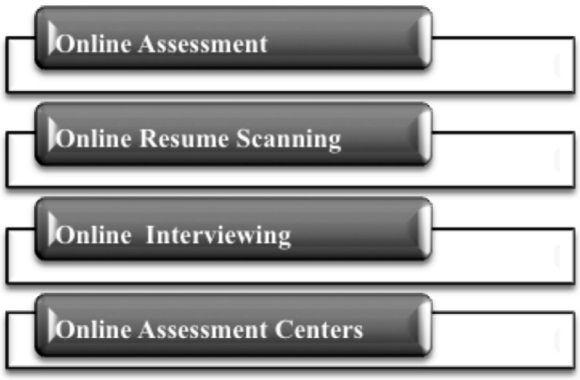
Sources of E-Recruitment

Source: Author

B) e-Selection

E-Selection is a paperless process through which the applicants or job seekers can be selected to jobs through quick dissemination of electronic documents and information nationwide and worldwide using internet.

e-Selection Techniques



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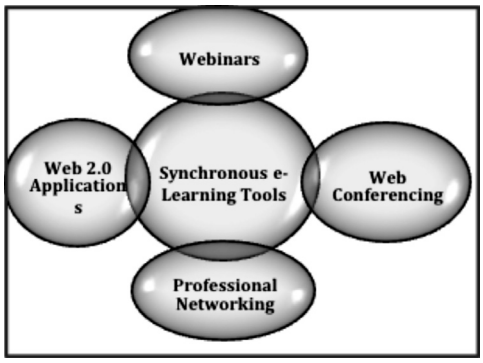
The criteria used in the research for assessing the effectiveness of e-selection are –applicant screening cost, selection cost, and cycle time reduction, number of recruits satisfying job requirements, Standardization and process consistency.

C) e-Learning

E-Learning is the use of technology to enable people to learn anytime and anywhere. E-Learning can include training the delivery of just-in-time information and guidance from experts. E-learning will facilitate to overcome the barriers of time, distance and resources.

e-Learning Techniques



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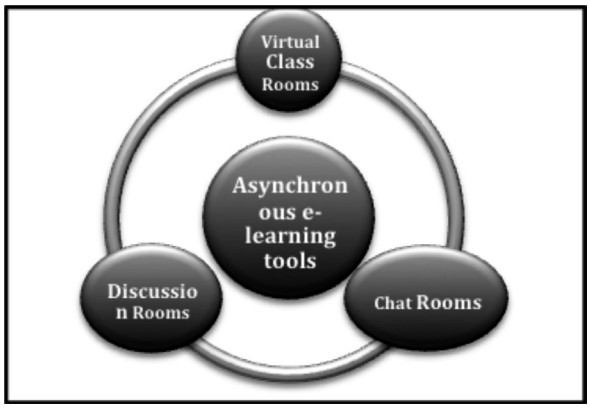
Synchronous e-learning techniques include: webinars, web conferencing both audio and video, professional networking, instant messaging and other web 2.0 applications.

Asynchronous e-learning includes self-paced learning modules, virtual class rooms and chat rooms and discussion groups. Apart from synchronous and asynchronous e-learning techniques, there are also built-in learning and knowledge management systems within organizations to facilitate e-learning for employees and executives.



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Effectiveness of e-learning for the study purpose is assessed using variables like Travel expenses, time saved ,job relevance of learning content, task time and time spent on learning and employee productivity.

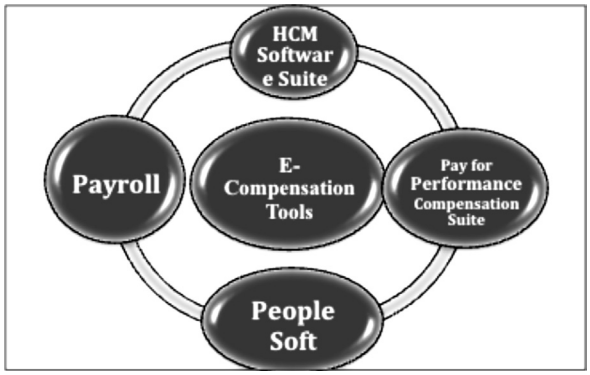
D) e-Compensation Techniques

E-Compensation is the integration of electronic software tools for modeling the Salary structure, Cash & Non-Cash plans that strategically drive performance. Managers are also able to provide total compensation reporting to their employees which will act as a valuable retention tool.

E-Compensation improves the efficiency and accuracy with which managers address compensation issues. Managers gain easy online access to total workforce compensation information, as well as third-party benchmarking and salary surveys that they can then use to request or perform salary changes.

1. E-Compensation Alerts notify HR managers when a Compensation Cycle is available for their group. When complete, changes are submitted and routed for approval.
2. Automated Salary proration and eligibility rules further eliminate manual intervention.
3. Facilitates viewing total compensation-related information for direct reports from a central location, including salary, cash components, and non-cash items.
4. Request or grant base salary increases for employees, which are automatically routed for approval, either during targeted review periods or on an ad-hoc basis.
5. Easily sets up workflow to automate approval routing.

   E-compensation effectiveness was estimated by seeking opinion on parameters like error count, time taken, statutory compliances, simplification of processes, effectiveness of job evaluation, and changes in time and ambiguity avoidance.



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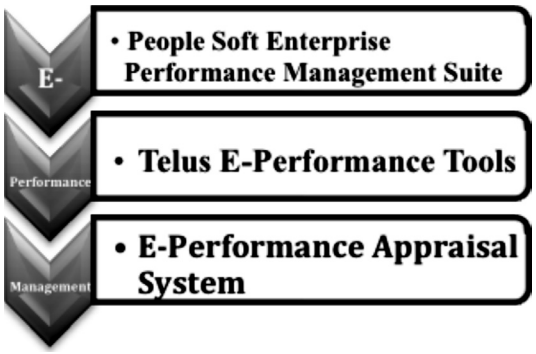
E) e-Performance Management

Performance is the accomplishment of a given task measured against preset standards of accuracy, completeness, cost, and speed. Performance enhancement due to HRMS in the firms was evaluated based on the estimation of speed, accuracy and cost of performing the HR functions. E-performance management may be defined as a system in which electronic technology is integrated with the performance management process of the organization in order to improve organizational, team and individual performance.

In the context of the research, the constructs used to assess e-performance management dimension are, accuracy, change in time, elimination of rater's bias and rating errors and ease of training needs assessment and determination of rewards with performance results. An effort was made to find the implications of e-performance management on all the mentioned factors.

e-Performance Management Tools



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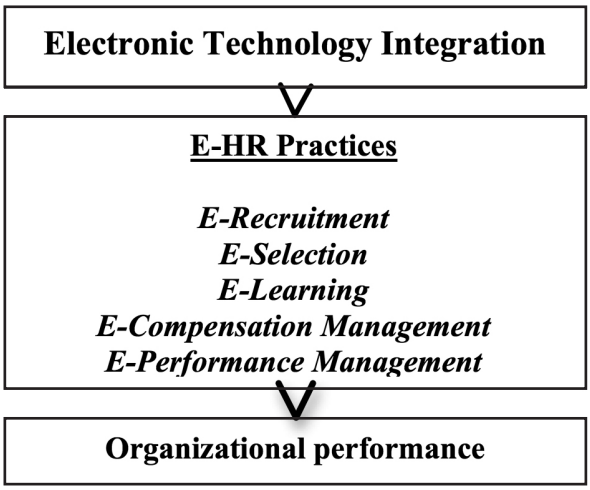
OBJECTIVES OF THE RESEARCH

Though there are several empirical studies related to the role of HRIS in organizations, concrete efforts to measure the implications of electronic technology integration with HR practices on Organizational effectiveness in automotive component industry have not been made so far. Current research work is undertaken in order to realize the following objectives:

1. To examine the implications of e-HRM on HR operational costs.
2. To evaluate e-HRM as a strategic tool for quality enhancement.
3. To appraise the effectiveness of digitized personnel management practices on process simplification.
4. To assess efficiency gains due to HR automation.

RESEARCH PREMISE

Many auto component firms have accepted and integrated electronic technology in their functional, operative and tactical processes. They have incurred massive expenses on technology incorporation with all HR processes. Through this research an effort was made to examine the implications of e-HRM on organizational performance.



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RESEARCH HYPOTHESES

Ha1: Cetirus Paribus, e-HR Practices lead to Simplification of HR activities.

Ha2: Digitized HR practices have resulted in personnel cost efficiency.

Ha3: Automation of HR practices has enhanced the quality of all HR processes.

Ha4: Effective time management is a significant outcome of e-HRM.

DATA ANALYSIS AND INTERPRETATION

This section presents the results of the study after examining and analyzing the relationship between dependent and independent variables considered for the study. Appropriate mathematical and statistical tools were employed to test the hypotheses that were formulated to assess the effectiveness of e-HRM on organizational performance in auto-component industry. The analysis was carried out using SPSS (20th Version) software application.

Twenty one statements used in the questionnaire were assessed on a five point Likert rating scale ranging from strongly disagree (1) to strongly agree (5). To simplify analysis, 21 variables of assessment were reduced to four factors based on their communality. This was done with the help of factor analysis and the principal

component analysis. The results of the analysis and observations pertaining to EHRM outcomes have been subsequently discussed.

Table 1: Reliability Statistics of Variables used to Assess Effectiveness of e-HRM

e-HRM Effectiveness Variables: Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.933	.929	21

The reliability analysis was conducted as shown in **table 1** by computing the Cronbach's alpha (α) for each moderating variable used to assess the effectiveness of e-HRM. The reliability of a measure indicates the stability and consistency of the instrument used in measuring a concept and it helps to assess the goodness of a measure (Sekaran, 2000). The Cronbach alpha test was conducted to ensure internal consistence and reliability between the moderating variables used to assess the concept.

The Cronbach's alpha for twenty one items or independent variables used to measure the concept of e-HRM was **0.933** with 'α' for each score ranging between **0.925 to 0.935** indicating that the measures have acceptable internal consistency since they are much above Nunnally's (1978) threshold limit of 0.70. The results of the reliability test conducted to validate the questionnaire are shown in **table 1**. The 'α 'based on standardized items need not be considered since all the items used were statements with multi point responses which mostly comprised of the same responses on a five point rating scale with responses given in a descending order (Min.-1 Strongly Disagree and Max. 5- Strongly Agree).

Results of Factor Analysis

Simple iterated factor analysis was carried out by iterating principal axis factors to four factors based on their communality. As a method of extraction, a promax oblique rotation technique was used since it was found that correlation exists between the variables considered for assessment. To determine the number of factors to be extracted, both theory and information was used by running the analysis to extract different numbers of factors and seeking which number of factors yields most interpretable results.

The steps involved in data reduction through factor analysis are indicated below:

Step-I: Pre-checking Sampling adequacy through KMO and Barlette's test of Sphericity.

Table 2: KMO and Barlette's Measure of Sampling adequacy

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.789
Bartlett's Test of Sphericity	Approx. Chi-Square	2075.765
	Df	210
	Sig.	.000

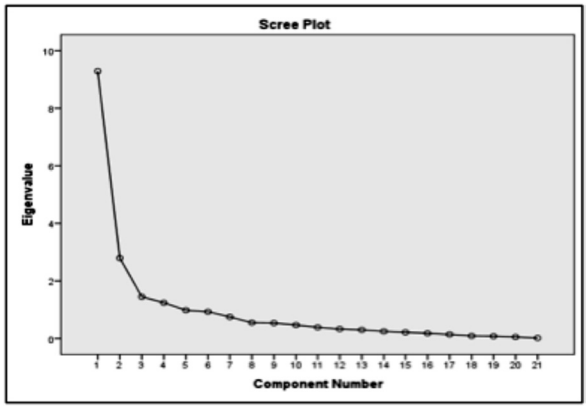
Source: Author

Kaiser-Meyer-Olkin test was conducted to ensure the adequacy of sampling size for factor analysis. As per the decision criteria if it is above 0.6 then the sampling size is adequate. From **table 2**, it can be observed that KMO measure of 0.789 is much above the threshold limit of 0.6 and Barlett's test of Sphericity with sig. value of .000 shows that the sampling adequacy is significant at 99 percent confidence level.

Step-II: Extraction Method, Principal factor axis.

Based on communalities, the proportion of each variable's variances due to underlying latent factors was identified based on the principal factor axis. Based on the factor loadings four factors having Eigen values more than one were identified as depicted in the scree plot in **figure 1**.

Figure 1: Scree Plot depicting component numbers with their Eigen Values



Source: Author

Scree plot in Figure 1 graphically displays the Eigen values for each factor andsuggests that 4 factors are prominent since they have Eigen values more than one.

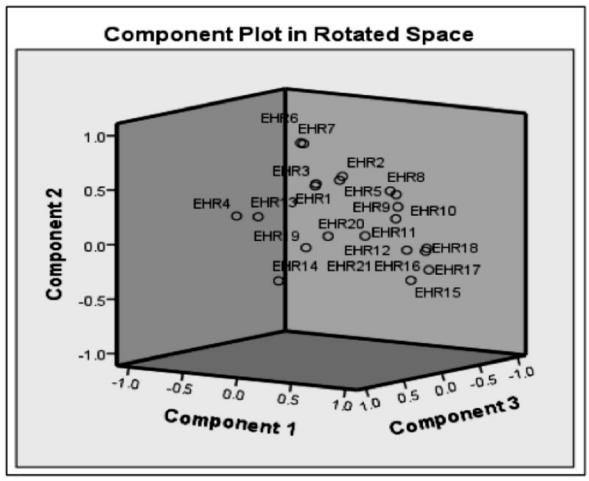
Table 3: e-HRM Components Correlation Matrix

Component Correlation Matrix				
Component	1	2	3	4
1	1.000	.542	.206	.175
2	.542	1.000	.334	.261
3	.206	.334	1.000	.158
	.175	.261	.158	1.000
Extraction Method: Principal Component Analysis. Rotation Method: Promax with Kaiser Normalization.				

Source: Author

The rotated factor matrix above indicates that a four factor solution is evident in the data above. Items comprising decision related factors, cost related factors, and quality related factors and accessibility factors appear to be grouping relatively based on their communalities. The Eigen values for factors 1, 2, 3 and 4 shown above have Eigen values greater than one and hence they have been extracted as components as shown in table 4 above.

Figure 2: e-HRM Component Plot in Rotated Space



Source: Author

The rotated component matrix in **figure (2)** shows how the factors are loaded around the components extracted through principal component analysis based on their communalities. Most of the factors are highly loaded on to the first component which is decision –oriented.

Table 4: Correlation between e-HRM Factors Extracted Through Factor Analysis and e-HR Practices

Correlations		
		E-HR Practices
Simplicity and Decision-Oriented Factors	Pearson Correlation	.325**
	Sig. (1-tailed)	.000
	N	110
Cost and Standardization -Oriented Factors	Pearson Correlation	.396**
	Sig. (1-tailed)	.000
	N	110
Accessibility and Savings related Factors	Pearson Correlation	.316**
	Sig. (1-tailed)	.000
	N	110
Quality and other Value Adding Factors	Pearson Correlation	.268**
	Sig. (1-tailed)	.002
	N	110
**.Correlation is significant at the 0.01 level (1-tailed).		

Source: Author

From **Table 4** we can observe that e-HR practices are highly correlated with the components extracted through principal component analysis. The correlation is significant at 99 percent confidence level.

Pearson's correlation coefficient of 0.325 at 0.01 significance level substantiates that e-HR practices will facilitate to make quick and effective decisions. Similarly the Pearson's coefficient of 0.396 (at alpha =0.01) indicates that e-HR practices help organization to reduce cost and standardize HR. Besides this E-HRM facilitates easy accessibility to information, enables saving time and cost, enhances quality and adds a lot of value to organizational performance enhancement.

Table: 5 Extraction of Factors based on communalities

Communalities		
	Initial	Extraction
EHR1: Data Input has Become Simpler	1.000	.621
EHR2: Ensures Flexibility to Employees	1.000	.592
EHR3: Facilitates Quick Learning	1.000	.742
EHR4: Saves Money	1.000	.813
EHR5: Develops Unique and Specialized Personnel	1.000	.673
EHR6: Has Positive Impact on employee Motivation	1.000	.721
EHR7: Facilitates Employee Engagement	1.000	.781
EHR8: Improves Employee Orientation	1.000	.786
EHR9: Improves Training and Development Process	1.000	.806
EHR10: Leads to Effective Career Planning	1.000	.754
EHR11: Personnel Management Becomes Simpler	1.000	.719
EHR12:Improves Occupational Health and Safety Process	1.000	.688
EHR13: Enables Easy Access to Knowledge and Information	1.000	.593
EHR14: Saves Cycle Time of all HR Activities	1.000	.684
EHR15: Ensures Quick Decision Making	1.000	.705
EHR16: Facilitates Identification of Training and Development Needs of Workforce	1.000	.774
EHR17: Facilitates Effective Decision Making	1.000	.766
EHR18: Useful for Effective Promotion Decisions	1.000	.772
EHR19: Reduces Paper Work	1.000	.662
EHR20: Enhances Quality of Workforce	1.000	.565
EHR21: Ensures Effective Auditability of all HR Activities	1.000	.552
Extraction Method: Principal Component Analysis.		

Source: Author

The four factors shown in **table 5** have been extracted based on their communalities.

Extraction - The values in table 5 indicate the proportion of each variable's variance that can be explained by the retained

Factors. Variables with high values are well represented in the common factor space, while variables with low values are not well represented.

Hypothesis 1

Ha1: Cetirus Paribus, E-HR practices lead to simplification of HR activities.

Table 6 (a) Model Summary of Dependent Variable: Simplicity and Decision-Oriented Factors

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.325[a]	.106	.098	.816
a. Predictors: (Constant), E-HR Practices				

Source: Author

Table 6 (b): Coefficients of Dependent Variable: Simplicity and Decision-Oriented Factors

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.652	.356		7.452	.000
	E-HR Practices	.253	.071	.325	3.576	.001
a. Dependent Variable: Simplicity and Decision-Oriented Factors						

Source: Author

The results of the regression analysis in Table **6 (a & b)** supports the hypothesis 1stated above and hence it is accepted. The standard beta coefficient is 0.325. The significance level is 0.01 for the independent variable E-HR practices indicating that adoption of e-HR practices has enhanced the decision making capabilities in HRM and has simplified HR processes in auto-component firms. The positive relation between the dependent and independent variable is significant at 99 percent confidence level as indicated by (P<0.01).

Hypothesis: 2

H_a2: Digitized HR practices have resulted in personnel cost efficiency and standardization.

Table 7 (a): Dependent Variable: Cost and Standardization - Oriented Factors

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.396[a]	.157	.149	.634
a. Predictors: (Constant), E-HR Practices				

Source: Author

Table 7 (b): Coefficients of E-HR Cost and Standardization -Oriented Factors

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.796	.277		10.108	.000
	E-HR Practices	.247	.055	.396	4.484	.000
a. Dependent Variable: Cost reduction and Standardization -Oriented Factors						

Source: Author

The results of the regression analysis in Table **7 (a & b)** supports the hypothesis 2 stated above and hence it is accepted. The standard beta coefficient is .396. The significance level is 0.000 for the independent variable E-HR practices indicating that adoption of e-HR practices has significantly facilitated standardization of HR practices and has also contributed immensely to the reduction of various HR costs. The positive relation between the dependent and independent variable is significant at 99 percent confidence level as indicated by (P<0.01)

Hypothesis 3

Ha3: Automation of HR practices has enhanced the quality of all HR processes.

Table 8 (a): Dependent Variable: Quality and other Value Adding Factors

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.268[a]	.072	.063	.506
a. Predictors: (Constant), E-HR Practices				

Source: Author

Table8 (b): Coefficients of Quality and other Value Adding Factors

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.601	.221		16.317	.000
	E-HR Practices	.127	.044	.268	2.897	.005
a. Dependent Variable: Quality and other Value Adding Factors						

Source: Author

The results of the regression analysis in **Table 8 (a & b)** supports the hypothesis 3 stated above and hence it is accepted.

The standard beta coefficient is .268. The significance level is 0.05 for the independent variable e-HR practices indicating that adoption of e-HR practices has significantly enhanced the quality of workforce as well as that of HR activities like compensation management, performance management, learning, recruitment and selection. The positive relation between the dependent and independent variable is significant at 99 percent confidence level as indicated by (P<0.01).

Hypothesis 4

Ha4: Effective time management is a significant outcome of EHRM.

Table 9 (a): Dependent Variable: Accuracy and time savings related Factors

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.323[a]	.105	.096	.612

Source: Author

Table 9 (b): Coefficients of Accuracy and Time saving related Factors

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.440	.235		14.641	.000
	E-HR Practices	.148	.042	.323	3.552	.001
a. Dependent Variable: Accuracy and Time -Savings related Factors						

Source: Author

The results of the regression analysis in Table **9 (a & b)** supports the hypothesis 4 stated above and hence it is accepted. The standard beta coefficient is .323. The significance level is 0.01 for the independent variable e-HR practices indicating that adoption of e-HR practices has significantly increased speed and accuracy besides saving the cycle time of all HR activities. The positive relation between the dependent and independent variable is significant at 99 percent confidence level as indicated by ($P<0.01$).

FINDINGS AND OBSERVATIONS

1. More than 92 percent of the firms considered for research had more than 4 e-HR practices.
2. E-HR practices have made data entry simpler and ensure flexibility in choice of benefits, leave and attendance management and time management.
3. E-HR practices have facilitated quick learning and development of unique and specialized personnel.
4. The time saved due to E-HR practices is found to be statistically significant.
5. E-HRM is found to have facilitated in employee engagement and better Quality of Work Life (QWL).
6. E-HRM has a positive impact on employee motivation and learning.
7. The use of e-HR practices have enabled easy access to knowledge and information and has enabled effective career planning.
8. The cycle – time of HR practices is found to have been reduced consequent upon the use of e-HR applications.
9. Decision making has become quicker and simpler in the organizations surveyed due to the use of Human Resource Information System and Decision Support Systems.
10. HR practitioners of the firms surveyed have observed that e-HR applications have enhanced the quality of their workforce.
11. It was also observed through study that the auditability of all HR activities has become easy as a result of e-HR applications.
12. E-HR applications are found to be susceptible to data security threats like data compromise, data loss and data thefts.
13. Some of the small and medium firms were frequently bothered by technical snarls and hence they were maintaining both manual HR records and electronic version of it.
14. Smaller firms could not afford to purchase integrated HR –packages due to high cost. They were mostly using simple standalone applications.
15. Some of the HR practitioners did not have clarity on the auditability of e-HR practices.

Suggestions and Recommendations

Some suggestions are enlisted below in order to overcome the inadequacies and lapses identified during research.

- Recruitment through Social Networking Sites (SNS) and other online resources should be increased to leverage from online e-recruitment resources.
- Web 2.0 technologies are not used as a source of recruitment in auto-component industry. The firms may avail of it to access larger pool of talented job-seekers.
- Many of the firms are resorting to RPO (Recruitment Process Outsourcing) since they are able to cut cost of recruitment as consultancy firms are making use of ATS, Recrumax and such other recruitment software applications. Auto-component firms can reduce their recruitment costs to a greater extent in the long run if they invest on purchase of such applications rather than outsourcing recruitment.
- By investing on e-recruitment,tools firms can reduce the cycle-time further.
- The recruitment expenses of larger firms are found to be less due to economies of scale and scope. Hence large firms in auto-component industry which are not making use of e-recruitment may adopt it and avail of it.
- The selection process of auto-component firms is partially automated there are many advanced selection tools like online interview tools, Recrumax,

e-selection suite and several others which will reduce the cost and cycle time of selection if utilized effectively. Firms should incorporate such applications.

- E-learning tools used are mostly basic in nature and hence auto-component firms may use advanced learning tools like authoring tools and LMS tools to attain higher benefits of e-learning.
- Most of the auto-component firms are using basic and stand-alone front-end applications in HR, they should try to use integrated packages like Oracle People soft, SAP_PM Suite and other integrated applications to reap maximum benefits of e-HRM
- Security threats are serious issues to be addressed in e-HRM. Auto-component firms should ensure that they adopt adequate security measures to avoid data thefts and data losses of any kind.
- They may also appoint a Data Base Administrator to take care of e-HR data management and HRIS security issues.
- The HR workforce may be given adequate training about the importance of streamlining e-HR practices as they would greatly contribute to organizational performance enhancement.
- The HR practitioners should be sensitized about the security threats and issues involved in e-HR data transfers and about the measures to be adopted to prevent and overcome them.
- Around 8 percent of the firms visited were not employing any e-HR practices. They are still conventional in their approach. Such firms may adopt e-HR to manage their workforce more efficiently.
- A significant correlation is observed between e-HR process consistency and auditability; hence the firms can improve their HR auditability through e-HR practices.
- Smaller firms may adopt e-HR practices to quicken their pace of HR activities.
- Auto-component firms may use online-interviewing to reduce the cycle time and cost of selection.
- Training should be imparted to employees who are resistant and not comfortable with e-HR practices.
- The duration of e-learning should be increased to generate full benefit of it.

CONCLUSION

e-HRM practices can lead to innumerable efficiency gains if they are utilized effectively. Though it is in the nascent phase in the auto-component industry, still the firms are able to attain efficiency gains in terms of reduced cost, saved time, and simplified processes, maintenance of consistence, standardization, increased auditability of recruitment practices and a few others like increased average applicant volume per vacancy. Most of the firms considered for survey were found to be more focused on reducing production cost through automation of production process rather than automation of HR practices. That is the reason why auto-component firms have not been able to fully realize the benefits of e-recruitment sources. The efficiency gains that they have attained now can only be rated as partial compared to other sectors of the economy like Information Technology, BPOs and KPOs. Hence it is highly recommended that the auto-component firms should make best use of online recruitment resources to attract a talented pool of employees in order to attain greater efficiency gains.

E-HRM has made remarkable strides in auto-component industry. Though the firms are employing very basic tools and application of e-HRM, they are able to enhance their performance by means of reduced task-time and cost, quickened pace of learning, employee motivation and employee engagement, quick decision making, enhanced quality of workforce and several other positive outcomes.

This empirical study provides terse evidence to justify the rationale behind massive investments on e-learning. If the firms under study have derived noteworthy benefits through simple and basic e-HR applications in addition to their conventional HR practices, then they'll surely be able to derive mindboggling benefits by investing on advanced e-HR applications to build the task-oriented skills and competencies of their employees as that would help them in further augmenting their business performance.

SCOPE FOR FUTURE RESEARCH

e-HRM is a contemporary concept and has adequate

scope for further research. There are several sub-systems under e-HRM like, HRIS, e-surveillance, e-time management, ESS, MSS and several others which have not been covered under the scope of this research. Future researchers may take up any one of the sub-systems of e-HRM and appraise its effectiveness or they may work on customizing and developing a new sub-system to integrate with the existing system of e-HRM. Also they can appraise the effectiveness of e-HRM in some other sector of the economy or some other industry.

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