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Applications of HRIS in Human Resource Management in India: A Study

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Abstract

This study intends to assess the applications of HRIS in human resource management (HRM) in companies operating in India. Primary data based on 544 respondents and 18 applications of HRIS in HRM were analyzed. Five factors from factor analysis were further analyzed. Respondents perceived "technical and strategic HRM" and "performance and reward management" as the most important factors for HRIS applications. The most frequent application of HRIS in organizations operating in India was found to be in "employee record", followed by "pay roll". Sophisticated HRIS applications i.e. "technical and strategic HRM", "performance and reward management" and "corporate communication" were also applied in organizations in India. ANOVA results showed that manufacturing and service companies differed significantly on all sophisticated HRIS applications. Mean scores showed that on all the sophisticated HRIS applications, service companies had significant edge over the manufacturing companies. However Indian and multinational companies did not differ significantly on any of the HRIS applications.

Keywords: Human resource information system, HRM, Corporate communication, Information technology, Sophisticated HRIS, India.

1. Introduction

The field of human resource management (HRM) can be characterized as having encountered frequent and numerous innovations in technology. Some of the terms include the human resource information system (HRIS), electronic human resource management (e-HRM) and virtual human resource management (VHRM) (Ngai et al., 2008). Tannenbaum (1990) defined human resource information system (HRIS) as "one which is used to acquire, store, manipulate, analyze, retrieve, and distribute information about an organization's human resource". Later HRIS was also defined as "the composite of databases, computer applications, and hardware and software necessary to collect/record, store, manage, deliver, present, and manipulate data for human resources" (Broderick and Boudreau, 1992). Beginning with 1960s, personnel management has been an early candidate of HRIS with office automation in payroll, benefit administration and other transaction processing applications such as employee record holding (Ball, 2001; Martinsons, 1994). Also, availability of low cost, generic, flexible, easy to install and easily customizable window based products helped smaller software houses in writing affordable, easily customizable, modular HRISs with better sophisticated reporting capabilities (Ball, 2001). This led individuals and organizations preferring use of computers and net based technologies in HRIS. In 1990s, the expectations were how HRIS can contribute in organization's HR strategic activities and help in business planning. Managements feel that computer based HRIS can offer the real solution for retention of critical human resource and its development. With an HRIS, the human resource department can effortlessly manage employee data, whenever required supplementing it with computer and web-based technology, allowing them to reallocate their energies towards more important HR activities like implementing policies to achieve organization goals.

Martinsons (1994) pointed out that HRIS is normally used for two different purposes. One for simple automation like payroll and benefits administration, and keeping the employee records electronically for administrative purpose to reduce costs and time. The other use of HRIS is for analytical decision making (Kovach and Cathcart, 1999). Interest

of this study is to seek which of the HRIS applications is used and preferred for HRM in Indian industry. Whether, HRIS is used only for administrative purpose as "automated filling cabinets" (Robinson, 1997) or used for "sophisticated" activities in Indian industry (Martinsons, 1994).

2. Review of Literature

Studies show that HRIS applications in human resource (HR) help in achieving primarily three objectives (Broderick and Boudreau, 1992). HRIS was categorized in three objectives i.e. cost reduction/efficiency gains, client service improvement/facilitating management and employees and improving the strategic orientation of HRM/innovation (Broderick and Boudreau, 1992; Ruël et al., 2004). Ruël et al. (2004) added a fourth dimension to it i.e. allowing integration of HR functions. These could be set as HRIS goals and taken as the basic reasons for adoption of HRIS in any organization. Over the past two decades, there have been a number of studies on HRIS. These studies have focused on the type of applications that predominate in HRIS (Broderick and Boudreau, 1992; DeSanctis, 1986; Martinsons, 1994), the contexts necessary for the successful implementation of HRIS (Yeh, 1997) as well as the conditions that support successful HRIS (Haines and Petit, 1997). Martinsons (1994) clarified the usage of HRIS as per the sophistication. He described the use of HRIS for administrative purpose i.e. in employee record-keeping, payroll, payroll benefits etc. in HR as "unsophisticated" (Martinsons, 1994). Studies have concluded that HRIS has mostly used for these HR activities (Altarawneh and Al-Shqairat, 2010; Ball, 2001; Hussain et al., 2007; Ngai and Wat, 2006; Ruël et al., 2004). Automation, streamlining administrative tasks, deletion of repetitive activities and the subsequent effects of these applications help HRIS to achieve basic purpose of cost and time reduction, process automation and efficiency gains (Altarawneh and Al-Shqairat 2010; Ball, 2001; Martinsons, 1994; Ngai and Wat, 2006; Ruël et al., 2004). The use of HRIS in training and development, recruitment and selection, HR planning and performance appraisal was viewed as "sophisticated" (Ball, 2001; Martinsons, 1994). Timelessness in data availability, removal of data duplication and improvement and streamlining of HR functions by HRIS helps in employee service improvement. Introduction of web based HRIS shifts HR activities to line managers and employees through self service technology. Therefore time squandered on basic administrative tasks can now be spent on strategic issues and implementing progressive new plans of the organization. It allows HR professionals to help employees design their career plan, training and development etc.. Integration of HRIS with other information systems along with applications of HRIS in implementing HR policies and practices that support business strategy of organization makes use of HRIS strategic (Marler, 2009). Kossek and her colleagues have also argued that a corporate human resource information system can practically and symbolically transform human resources into a strategic business partner (Kossek et al., 1994). Ruël et al. (2004) found that an organization with global presence or multi-plant company requires integration. Imagining HR in these organizations without a web based HRIS applications is a myth.

Many studies have been carried out on various applications of HRIS (Ball, 2001; CedarCrestone, 2006; De Alwis, 2010; Kinnie and Arthurs, 1996; Lin, 1997; Teo et al., 2001; Saharan and Jafri, 2012). A study in Taiwan found that HRIS is most extensively utilized at the EDP level, followed by the MIS and DSS levels (Lin, 1997). Kinnie and Arthurs (1996) in their survey on UK companies revealed that the most frequent uses of HRIS were in operational areas of employee records (72%), payroll (66%), pensions (57%) and employment contract administration (48%). Another study found that employee record-keeping (96.8%), payroll (90.5%) and benefits management (57.1%) were the most common HRIS applications (Teo et al., 2001). Ball (2001) in a survey in UK found that current employee details and organizational salary details were the most frequently applied areas. Later, Ngai and Wat (2006) found that in Hong Kong companies the two major applications of HRIS are providing general information (86.4 %) and payroll services (84.7%). Recruitment and selection (11.1%) and succession planning (7.9%) were least used HRIS applications (Teo et al., 2001). Ngai and Wat (2006) also showed that corporate communication (20%) and recruitment and selection (26.9% and 19.1%, respectively) were least used HRIS applications. These studies show that HRIS is more commonly used for administrative purposes like employee record-keeping and payroll rather than for strategic purposes (Groe et al., 1996; Kovach and Cathcart, 1999).

However, many studies have shown that companies have started using sophisticated HRIS like training and development, performance management, compensation management and corporate communication (CedarCrestone, 2006; De Alwis, 2010; Saharan and Jafri, 2012). CedarCrestone (2006) in HCM Surveys on US companies

broadened the scope of HRIS applications. Administrative HRIS was still the most popular application (62%), companies reported an increasing use of strategic applications i.e. talent acquisition services (61%), performance management (52%), or compensation management (49%) (CedarCrestone, 2006). De Alwis (2010) in his study on Sri Lankan industry shows that the most commonly used modules in HR department are training and development, recruitment and selection and performance appraisal and are being utilized by all the companies. Recent study on Indian companies also found that HR professional had major applications of HRIS as recruitment and selection (67.2% and 71.9%, respectively), pay roll service (67.2%), providing general information (67.2%), compensation (67.2%), performance appraisal (62.5%) and job analysis and design (62.5%) (Saharan and Jafri, 2012). Also HRIS was quite in use in corporate communication (48.2%) (Saharan and Jafri, 2012). The most popular future applications of HRIS had been predicted as training and development (72.5%), career development (60.8%) and performance appraisal/management (58.8%) (Teo et al., 2001). There appears to be shift towards strategic applications of HRIS. The possible reason could be that most of the organizations which are using HRIS for few years for now, want to explore possibilities of strategic HRIS applications over the next few years (Teo et al., 2001).

3. Objectives of the Study

The opening up of the market in India and technology revolution has made applications of HRIS in India a reality. The main objective of the study is "to explore the applications of HRIS in companies operating in India". To fulfill the main objective, study attempts to seek the answers to the following questions:

- To study the applications of HRIS in India.
- To assess the difference of perceptions of HRIS applications between manufacturing and service companies in India.
- To assess the difference of perceptions of HRIS applications between Indian and multinational companies in India.
- To assess the difference of perceptions of HRIS applications across type (Indian and multinational) and nature (manufacturing and service) of organizations operating in India.

4. Research Methodology

The study is based on primary data. For data collection, a structured questionnaire was developed by including the variables used in various studies (Altarawneh and Al-Shqairat, 2010; Ball, 2001; Kinnie and Arthurs, 1996; Ngai and Wat, 2006; Ngai et al., 2008; Ruël et al., 2007; Teo et al., 2001). Different variables included were like: HR planning, job analysis and design, training and development, disciplining procedure, performance appraisal and review, employment reward, compensation management, pay roll, current employees' information, and employment leave (as in Altarawneh and Al-Shqairat, 2010); recruitment, pay roll benefit, self-service web portal and internal and external communication (as in Ngai et al., 2008); corporate communication (Ngai and Wat, 2006); historical record of employees (Ball, 2001) and strategic management (Ruël et al., 2007). The queries were assessed on Likert's 5-point scale ranging from strongly disagree to strongly agree i.e. strongly disagree (1), disagree (2), neither agree nor disagree (3), agree (4) and strongly agree (5). Statistical tools like factor analysis, analysis of variance (ANOVA), mean and grand mean scores were used to analyze the gathered data. For calculating the reliability of the data, cronbach's alphas were also calculated. A total of 544 responses were received from companies operating in India. The detailed distribution of sample of respondents across nature and type of companies is shown in table 1.

5. Results and Discussion

Variables regarding various applications of HRIS in HRM, considered for the study, were subjected to principal component factor analysis with varimax rotation. Factor analysis extracted five factors, loading for all variables, eigen values and percent of variance explained of each factor. Compensation management variable was significantly loaded on two factors i.e. "performance and reward management" and "pay roll". Factor analysis brought out five

important dimensions regarding application of human resource information system (HRIS) in human resource management (HRM). The brought out factors with statistical details were:

F1: **"Application(s) of HRIS in technical and strategic HRM"** on which six variables were loaded. There variables were HR planning, job analysis and design, recruitment, training and development, disciplining procedures and strategic management. (Factor statistics: $\bar{x}$ =3.97; SD= .68; α= .830)

F2: **"Application(s) of HRIS in performance and reward management"** on which again four variables were loaded. These variables were performance appraisal and review, promotion, employment reward and compensation management. (Factor statistics: $\bar{x}$ =3.94; SD= .73; α= .795)

F3: **"Application(s) of HRIS in pay roll"** had loading of three variables out of which one variable was common with application in performance and reward management. These variables were compensation management, payroll service and pay roll benefits. (Factor statistics: $\bar{x}$ =4.11; SD= .71; α= .803)

F4: **"Application(s) of HRIS in corporate communication"** on which other three variables were loaded. These variables were corporate communication, self-service web portal and internal and external communication. (Factor statistics: $\bar{x}$ =3.91; SD= .78; α= .748)

F5: **"Application(s) of HRIS in employee record"** had loading of three variables. These variables were historical record of employees, current employees' information and employment leave. (Factor statistics: $\bar{x}$ =4.19; SD= .63; α= .708)

This reduced data was further analyzed by applying 2-way ANOVA. Table 2 shows the results of analysis of variance (ANOVA) for each of the five factors, the corresponding significant levels of main effects i.e. organization type (Indian and multinational) and nature of organization (manufacturing and service), and also the interaction between the organization type and nature of organization, indicating the difference in perceptions of managers/employees in applications of HRIS. Table 3 shows the means and grand means of five factors those were helpful to explain the direction and extent of difference of perceptions of managers/employees including Indian and multinational companies as well as manufacturing and service companies operating in India.

Pattern of loadings showed that the respondents had given maximum importance to the first factor i.e. "applications of HRIS in technical and strategic HRM" followed by "applications of HRIS in performance and reward management". The factor named "application of HRIS in employee record" was given the least importance. Overall, respondents felt that applications of HRIS was highest in factor "employee record" ($\bar{x}$ =4.19), followed by "pay roll" ($\bar{x}$ =4.11) (see Table 3). Past studies also revealed that the most frequent application of HRIS was in employee records (Groe et al., 1996; Kinnie and Arthurs, 1996; Kovach and Cathcart, 1999; Lin, 1997; Ngai and Wat, 2006; Ngai et al., 2008; Teo et al., 2001), and next in pay roll service (Ball, 2001; Kinnie and Arthurs, 1996; Lin, 1997; Ngai and Wat, 2006; Teo et al., 2001). Further table 3 explained that HRIS was also applied highly in case of "technical and strategic HRM" ($\bar{x}$ =3.97), "performance and reward management" ($\bar{x}$ =3.94), and "corporate communication" ($\bar{x}$ =3.91). Use in compensation analysis and corporate communication were found as moderate popular application. Similar results were also found by other studies (CedarCrestone, 2006; Richard-Carpenter, 1993; Ngai and Wat, 2006). In a recent study conducted on applications of HRIS also confirmed that all these factors were used moderately in organizations operating in India (Saharan and Jafri, 2012).

Table 2 shows that manufacturing companies and service companies differed significantly (P≤0.000) on the factor "applications of HRIS in technical and strategic HRM". Further, table 3 shows the perceptions of managers/employees of both HR and others. The managers/employees of service companies ($\bar{x}$ =4.07) perceived more about the use of HRIS in technical and strategic HRM than manufacturing companies ($\bar{x}$ =3.87). Further table revealed that Indian companies ($\bar{x}$ =3.99) had comparative edge over multinational companies ($\bar{x}$ =3.92).

The next factor i.e. "application of HRIS in performance and reward management" showed that manufacturing companies and service companies differed significantly (P≤0.036). Table 3 showed that employees/managers of service organization ($\bar{x}$ =3.99) felt that they apply HRIS in performance and reward management more than manufacturing companies ($\bar{x}$ =3.89). Further, service sector of both Indian and multinationals apply HRIS in performance reward and management more than its counterparts. The difference of perception between the multinational companies' service sector ($\bar{x}$ =4.03) and its manufacturing sector ($\bar{x}$ =3.78) is more pronounced. Within multinationals, while service sector apply HRIS highest amongst the groups its manufacturing sector apply

HRIS least in performance appraisal and reward related activities.

Analysis of factor "application of HRIS in pay roll" from table 2 showed that there was no significant difference in perception of managers/employees according to organization type and nature of organization. Still table 3 results pointed that multinational companies ($\bar{x}$ =4.19) and service sector companies ($\bar{x}$ =4.13) have slight edge in applying HRIS in pay roll over Indian companies ($\bar{x}$ =4.08) and manufacturing sector companies ($\bar{x}$ =4.08), respectively. This showed that HRIS application is there in all type and nature of companies. This was in conformation with earlier studies (Ball, 2001; Kinnie and Arthurs, 1996; Lin, 1997; Ngai and Wat, 2006; Teo et al., 2001).

In case of "application of HRIS in corporate communication", Table 2 results showed a significant difference in both the nature of organization ($P \leq 0.001$) and interaction between organization type and nature of organization ($P \leq 0.025$). Further, reference to table 3 showed that HRIS applications in corporate communication was more in service organizations ($\bar{x}$ =3.99) as compared to manufacturing organizations ($\bar{x}$ =3.82). The interaction also showed that service sector multinationals ($\bar{x}$ =4.03) as well as Indian ($\bar{x}$ =3.98) companies had been using HRIS in corporate communication more than its counterpart in manufacturing sector i.e. multinationals ($\bar{x}$ =3.60) and Indian ($\bar{x}$ =3.88) companies, respectively. It may be that there is more corporate communication requirement of service companies due to its nature of more dealings and technology driven work culture when compared to manufacturing companies. Also the service sector organizations in India are comparatively new as compared to manufacturing sector organizations. Highest use of HRIS in corporate communication was in multinational service sector organizations, while multinational manufacturing sector organizations ($\bar{x}$ =3.60) used it the least. Study shows that the scope of HRIS applications have broadened as companies an increase in its sophisticated applications (CedarCrestone, 2006).

Table 2 showed no significant differences in perceptions of employees on organization type, nature of organization or on the interaction between the two on the factor "applications of HRIS in employee record". Table 3 showed that the managers/employees perceived the applications of HRIS in organizations was highest in case of employee record ($\bar{x}$ =4.19). Further, Table 3 revealed that service companies ($\bar{x}$ =4.24) had edge over manufacturing companies ($\bar{x}$ =4.14) while multinational companies ($\bar{x}$ =4.27) had slight edge over Indian companies ($\bar{x}$ =4.16) when applying HRIS for employee record.

6. Conclusion

Results indicate that the most important applications of HRIS are in "technical and strategic HRM' and "performance and reward management". This shows that companies in India find "sophisticated" application of HRIS for decision making as important. In organization type (both Indian and multinationals), nature of organizations (both manufacturing and service) and also overall, results showed that the most frequent applications of HRIS was in "employee record" followed by "pay roll" in organizations operating in India. The study is in conformity to earlier studies that HRIS is most frequently applied for maintaining employee record followed by pay roll activities. Reason for this could be that use of HRIS in these applications had been since birth of HRM. Beginning in 1960s, personnel management has been an early candidate for office automation in pay roll, benefit administration and other transaction processing applications such as employee record holding (Ball, 2001; Martinsons, 1994). It was the pay roll that gave birth to HRIS (Ball, 2001). Further, these traditional applications of HRIS in HRM were first computerized due to legal obligations. Managers/employees perceived that all other factors of HRIS applications i.e. "technical and strategic HRM", "performance and reward management", and "corporate communication" were also applied quite highly in companies in India, and could be termed as "sophisticated" applications of HRIS. The study concludes that scope of HRIS applications have broadened in India. Although operating HRIS applications like employee record and pay roll still remains the most popular applications but there is an increase in use of HRIS in sophisticated activities and decision making. Past studies also depicted similar findings (see CedarCrestone, 2006; Saharan and Jafri, 2012). Further, when compared, sophisticated HRIS applications in service companies in India were found to have a significant edge over manufacturing companies on all the three factors. This clearly indicated that service companies apply more of HRIS in decision making and other sophisticated HR activities than the manufacturing companies. Service organizations in India are comparatively new than manufacturing organizations. The environment in service sector organizations in India is more comfortable and technology driven than the manufacturing sector organizations where it is more traditional and tedious. All these factors may have led to less

resistance from service sector employees and more support from top management in adopting technology. There is no significant difference in the use of HRIS between Indian companies and MNCs operating in India. It shows that Indian companies are using HRIS to the same extent as MNCs.

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Table1. Distribution of the sample

Nature of organization	Organization type		Total
	Indian Cos.	MNCs	
Manufacturing Cos.	214	56	270
Service Cos.	188	86	274
Total	402	142	544

Table 2. Summary results of analysis of variance (ANOVA)

Factors		Effects		
		Organization type (Main)	Nature of organization (Main)	2-way interactions
		F-value	F-value	F-value
F1	Application(s) of HRIS in technical and strategic HRM	2.822 (0.094)	14.962 (0.000)	2.212 (0.138)
F2	Application(s) of HRIS in performance and reward management	0.301 (0.583)	4.405 (0.036)	2.171 (0.141)
F3	Application(s) of HRIS in payroll	2.214 (0.146)	0.257 (0.612)	0.000 (0.988)
F4	Application(s) of HRIS in corporate communication	2.307 (0.129)	11.698 (0.001)	5.038 (0.025)
F5	Application(s) of HRIS in employee record	2.790 (0.095)	0.996 (0.319)	0.524 (0.470)

Note: ***** Significance levels are indicated in parentheses.

Table 3. Summary results of mean and grand mean scores

Factors			Organization type		
			Indian	Multinational	Grand mean
F1	Application(s) of HRIS in technical and strategic HRM	M	3.91	3.70	3.87
		S	4.07	4.06	4.07
		GM	3.99	3.92	3.97
F2	Application(s) of HRIS in performance and reward management	M	3.92	3.78	3.89
		S	3.97	4.03	3.99
		GM	3.94	3.93	3.94
F3	Application(s) of HRIS in payroll	M	4.06	4.17	4.08
		S	4.10	4.20	4.13
		GM	4.08	4.19	4.11
F4	Application(s) of HRIS in corporate communication	M	3.88	3.60	3.82
		S	3.98	4.03	3.99
		GM	3.93	3.86	3.91
F5	Application(s) of HRIS in employee record	M	4.11	4.26	4.14
		S	4.22	4.28	4.24
		GM	4.16	4.27	4.19

Note: M- Manufacturing companies mean scores; S- Service companies mean scores; GM- Grand mean scores of total companies

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