A Review of Human Resource Information Systems (HRISs) in Organizations

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Abstract

It is never worthless to invest in training and educating employees in human resource (HR) departments in the area of information technology (IT). The reasons behind this include: (a) organizations around the globe have HR-related information needs and (b) IT issues have become increasingly relevant to business endurance. HR information systems (HRIS) can be a strategic resource and a powerful tool in the hands of decision makers. Alternatively, it can also be a burden and waste of human and non-human resources in organizations. This paper includes a general overview of HRIS, automated performance management and human resource tasks, eHR or technology in human resource management and HRIS challenges related to technology. Finally, the author presents some implications for practitioners and recommendations for future studies. This paper is intended to allow researchers to expand their understanding of fundamental features and characteristics relevant to effective HRIS in organizations. In addition, the paper is intended to support practitioners in highlighting critical issues necessary for the successful implementation of HRIS. Although the paper is narrative or descriptive in nature and non-statistical, it can be used to enhance the understanding of HRIS patterns in organizations.

Keywords: employee, HR, HRIS, information, organization

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1. Overview of Human Resource Information Systems (HRIS)

Information technology has undoubtedly changed the face of human resource management (HRM) around the globe. Perhaps the most essential use of technology in HRM is an organization’s human resources information system (HRIS). The term ‘information system’ implies the interrelated individuals, data, technology and organizational processes an organization uses to collect, store, process and disseminate information (Dessler, 2011). Apparently, today, the concept of an information system has become synonymous with computerization (Miner & Crane, 1995). Unsurprisingly, computers have abridged the data analysis task and they can be of great importance in HRM. For example, payroll, employee records, equal employment opportunity information, compensation and benefits are frequently computerized HR functions (Mathis & Jackson, 2000). In terms of HRIS, it has been described as an integrated system to collect, process, store, analyze, retrieve and disseminate critical information, which can provide useful support in HR decision making, coordination, control, analysis and visualization of an organization’s HRM activities (Mathis & Jackson, 2003; Dessler, 2000; Miner & Crane, 1995; Gomez-Mejia, Balkin & Cardy, 2004). In other words, an HRIS links together all HR information into a system, and large organizations integrate their separate HR systems into an integrated HRIS (Dessler, 2003). Following this line of thought, the challenge for HR professionals is to integrate the conventional HR functions of the organization, without a glitch, with other corporate value-adding activities (Lee, Lee & Kwon, 2007).

Jackson and Schuler (2000) noted that when computer technologies are utilized to collect, analyze and allocate information about an organization’s employees, the consequential systems are indicated as HRIS. Moreover, HR information management (HRIM) systems are also referred to as HRIS, when computer technologies are applied to collect, scrutinize and allocate data about job candidates and
employees (Jackson, Schuler & Werner, 2009). They also explained that HRIM systems not only communicate an organization’s policies and strategies to all employees, regardless of their settings but, also, allow employees to access the following matters from around the globe:

- information about performance appraisals and competencies needed for a particular task in the organization;
- professional development plans and tactics for managing their progress;
- announcements related to job openings and descriptions throughout the organization and
- all benefit packages offered in organizations around the world.

Bulmash (2011:53) observed “… these systems provide a repository for information/data to be stored and maintained, and they possess varying degrees of reporting capability. However, for the data to be useful, they need to be transformed into information that is meaningful to managers.” HR departments are facing this challenge today and will eventually determine their capacity in providing strategic HR services.

Propositions behind installing such a system and the anticipated outcomes indicate the following: (a) competitiveness; (b) increase in the efficiency of HR activities and the line management of the organization; (c) elevate the organization to another level, as it generates a mixture of HR-related documents and (d) capable of assessing HR activities concerning the organization’s strategic plans (Dessler, 2000). When an efficient HRIS is implemented, the prime benefit obtained is that HR personnel can focus more effectively on the organization’s strategic goal instead of on regular practices (Belcourt, Bohlander & Snell, 2008). This would involve employee needs analysis, employee promotions and career paths and the effects of the organization’s policies to enhance and/or maximize the
organization’s profits. The most noticeable effects of HRIS have been operational (e.g., automating routine tasks, improving administrative works, containing costs and enhancing productivity). Nevertheless, the changing face of HRIS has been directed toward self-service, setting up systems (often on an intranet) to permit decision makers to access employee records for business purposes and allowing employees to access and modify their own benefits and other private information (Belcourt et al., 2008).

An HRIS should be tailored to deliver information that is: (a) timely: leaders must be able to access the latest information; (b) accurate: leaders must be able to count on the quality of the information offered; (c) concise: leaders should be able to obtain a great deal of information at any one time; (d) relevant: leaders should receive only the information wanted for each circumstance and (e) complete: leaders should obtain inclusive and not limited amounts of information (Mondy & Mondy, 2008). Consequently, HRIS are considered advocates of: (a) planning to satisfy all business needs; (b) fulfilling the employees’ desires in an organization and (c) controlling all types of business policies and programs (O’Brien & Marakas, 2006).

The following tasks are involved when creating an HRIS:

**Determination of information needs:** information, data and necessary resources for decision-making processes and employers at different levels may require different types of information. Thus, an analysis of all activities performed in an organization, work plans and restrictions that may have an effect on the implementation of an HRIS system is critical. However, there must be the realization that these aspects vary from one organization to another and from one industry to another.

**Designing the system:** during this phase, the release of identified information should occur in a style that matches the employers’ needs for the information. In all cases, structuring an HRIS system involves
the development of some processing methods, in order to convey the desired information to employers in different positions.

Implementation: in this step, the system has already been installed and employees should be able to acquire all of the required skills and knowledge available through training courses and orientations. Moreover, an emphasis should be placed upon the integration of the HRIS system with other relevant organizational aspects.

Monitoring and evaluation: this step includes performance appraisals to recognize deficiencies in the system and to take corrective actions to ensure the success of the implementation phase. The system should be assessed continually and a high degree of flexibility should be incorporated to make it possible to modify various components periodically, inside and outside the organization (Bhavsar, 2011).

With that said, an HRIS moves beyond simply storing and retrieving data to include more applications, such as generating reports, forecasting HR needs, strategic planning, career and promotion planning and appraising HR policies and practices (Bohlander & Snell, 2004). Additionally, numerous organizations have implemented HRIS that also enhance employee selection and recruitment, job placement; performance evaluations, employee benefits and compensation, training and development, security, health and safety issues and many other HRM functions. Consequently, the design of an HRIS assists decision makers in making more appropriate decisions. This is particularly true when careful consideration is given to HRIS subsystems, including: employee administration; recruitment; time and attendance; training and development; pension management; employment equity; performance appraisals; benefits and compensation management; organizational management; safety and health; labour relations and payroll (Bulmash, 2011). According to research and the Equal Employment Opportunity Commission (EEOC), the HRIS should also include information about every employee’s age, race, religion, sex, place of birth and marital status;
however, this information should not be exploited for selection, promotion, training and compensation or evaluation purposes (Cherrington, 1995). Beside this, some of the more commonly requested reports generated by an HRIS include general information (e.g., name, address, phone number, postal code and age); compensation documents (e.g., salary statements or history); performance assessments; absenteeism (e.g., sick leave, personal leave, paid or unpaid leaves and number of allowed vacation days); duties performed and position titles; types of training received and competencies required (Bulmash, 2011). However, to take full advantage of an HRIS, scholars and practitioners should promote significant components its success and information-related design characteristics (Mueller, Strohmeier & Gasper, 2010).

Moreover, an HRM information system (HRMIS), also known as a personnel MIS, can play a vital role in ensuring organizational success. Some of the activities performed by an HRMIS include:

**Human resource planning:** one of the fundamental phases of any HRMIS is specifying employee needs, to determine or, at least predict, how many employees are needed, put the correct one in the correct place and anticipate the number of employees needed in the future.

**Employee selection and recruitment:** if the HR plans show that more employees are needed, the next step involves recruiting and selecting those employees. Organizations seeking new personnel normally use computers to evaluate potential candidates to screen them and begin the recruiting efforts. In addition, applicants upload their CVs to the Internet and then HR managers can recognize candidates who they might be interested in interviewing.

**Training and skills inventory:** jobs that primarily involve thinking and problem solving activities, such as professional and technical occupations, require very specific training for new candidates. After
the training course is completed, the employees’ mastery of the relevant skills can be evaluated.

**Scheduling and job placement:** schedules are planned for each employee, specifying particular tasks to be performed over a specific period. Job placements frequently are determined according to employee skills inventory reports, which aim to identify the right person for the right job.

**Wage and salary administration:** another HRMIS subsystem concerns wages and salaries, benefits, medical payments and retirement accounts. Wage and salary information can be obtained from the organization’s database and controlled by the HRMIS to present accurate information and documents to the upper-level of management.

**Outplacement:** employees quit their jobs for a variety of reasons. Outplacement services are delivered by many organizations to assist employees in making the right decision when moving to another organization. Thus, outplacement can include job training and counseling, financial and retirement planning and many other options. In addition, some employees use the internet to plan for such a transition or retirement (Stair & Reynolds, 2008).

According to Noe *et al.* (2007:549), a standard feature of a modern HRIS is the use of relational databases, which store data in separate files that can be linked by common elements. These common elements are fields identifying the type of data. Commonly used fields for an HR database include name, Social Security number, job status (i.e., full-or part-time), hiring date, position, title, rate of pay, citizenship status, job history, job location, mailing address, birth date and emergency contacts. A relational database is far more complicated than the traditional technique of storing employee information by name, with one file per candidate.
Another common use of an HRIS is applicant tracking or retrieving and controlling job applicants’ records efficiently for hiring and termination purposes, planning and career development. By assessing such data, the HR department can assess the long-term horizons of its recruiting and selection procedures; fortunately, computer hardware and software have made tracking of HR much easier. Jackson and Schuler (2000) observed that a large number of global organizations have considered implementing sophisticated HRIS with the purpose of maintaining records concerning who is performing what and where. For global organizations, it is perhaps fundamental to use a sophisticated HRIS because assigning employees overseas while keeping track of each division and all departmental practices and policies might otherwise be overwhelming (Dessler, 2003). However, global and domestic organizations use HRIS to assist them in planning their HR both qualitatively and quantitatively (Khera & Gulati, 2012).

After an exhaustive review of literature, the author can summarily offer the following benefits of HRIS in organizations as follows: updated records; quick information processing; better awareness within individuals in organizations; accurate information; high level of employee satisfaction; better employee involvement programmes; the reduction of repeated information reported to employers and better access to a plethora of information in the formats required. By contrast, obstacles involved in the implementation of an effective HRIS can be interpreted as follows: ineffective communication among individuals in organizations; ineffective management and lack of commitment to the development of the organization; contentment with the existing circumstances; change resistance; insufficient budget; problems in coordinating with individuals, departments and organizations; timing issues; lack of wisdom about choosing the right person in the right place and, above all, politics involved in the implementation of the system.
As a caveat, an HRIS is never considered a substitute for data accuracy and such a database requires a regular updating and reviewing processes in both international and domestic organizations.

2. Automated Performance Management and HR Tasks

Technological growth has transformed the way many organizations operate and handle performance management. Technology permits organizations to transform large amounts of data into practical or valuable information and allows both employers and employees to recognize deficiencies in their systems. Consequently, technology is transforming the way HR departments manage and use employee records and the distribution of information. Today, HR personnel use contemporary technology to automate most of their tasks in managing employee records and allowing employees access to information for training or benefits. Noe et al. (2007) noted that automation makes a remarkable contribution to HR departments; for example:

- automation has increased HRM efficiency through minimizing the number of individuals required to perform particular tasks;
- it facilitates the work of HR experts and consultants, when clarifying how the HR department can help the organization accomplish its mission, vision and objectives;
- it provides some tactics that may construct and enhance systems for knowledge-sharing to promote the creation of a learning organization;
- using tools and information processing to perform tasks that have been completed by employees and
- employees can easily follow the organization’s new trends and policies and receive information about their benefits online.
Jackson et al. (2009) reported that automation can do more than increase efficiency and save time; it can: (a) enhance the reliability of assessments and make them more reasonable and fair to employees; (b) communicate performance criteria to employees and (c) assist leaders in developing performance reports that exhibit strengths, weaknesses and opportunities. Nonetheless, careful planning and cooperation among diverse quarters of the organization are strongly required. Moreover, several technologies have been adopted by organizations to improve their productivity and they are often part of a HRIS. These are:

**Transaction Processing System (TPS):** a TPS conducts computations and calculations required in evaluating HRM decisions and practices and involves documenting decisions and practices related to employee relocation, training costs and benefit packages. TPS are applications for information processing for routine day-to-day business activities. All of an organization’s important data may be stored in a single extensive database that is considered the organization’s central information resource. The database can be updated by either batch processing, where data are gathered over a specific period and processed together, or online, where data processing occurs as information becomes available. In short, a TPS offers direct support to the operational level of an organization. It captures, stores and transmits details of business interactions.

**Decision Support Systems (DSS):** DSS are computer software systems tailored to assist employers in overcoming barriers and solving problems. They frequently have a ‘what if?’ feature that employers can use to test interactions between different types of information and determine how the expected outcomes will vary. By gathering this kind of information, the DSS would select specific reports that could be useful in making important decisions. The system can also help in making appropriate decisions for HR planning. It has been described as an interactive system that reports information required to support decision makers and, while some DSS
are dedicated to specific dilemmas, others are used for more general goals. If the services offered by a DSS are not adequate to justify a complete DSS component, they may be tailored into a management information system (MIS) at higher cost. However, a DSS tends to be more interactive than MIS, enabling employers to communicate directly with computer programs that control the system and obtain the results of different investigations rapidly.

**Expert Systems (ES):** ES are considered extensions of DSS and they are computer systems that gather and integrate decisions made by experts in a particular area. The system can provide recommendations based on the decisions and rules offered by users. In other words, the system is structured to make recommendations that a human expert would recommend in a particular area. ES can provide high quality information and lower costs, avoid mistakes resulting from decision-making biases and increase efficiency by lowering the number of unskilled employees doing work that may require skilled employees. Nevertheless, ES are extremely difficult and expensive to develop. ESs are being applied in many different areas, such as employee work scheduling, identifying credit limits for credit card applicants, monitoring machinery in a plant to forecast specific problems, making mortgage loans, mineral and oil exploration, equipment fault location, pricing airline tickets and in the insurance industry (Noe et al., 2007; Griffin, 2008; Bartol & Martín, 1991; Gitman & McDaniel, 2006; Orilia, 1986; Boone & Kurtz, 2010; Norton, 2006; Thompson & Cats-Baril, 2003).

Accordingly, computer software is necessary to reflect the organization’s values and goals more appropriately and to offer fair assessments; for example: KnowledgePoint’s Performance Impact System walks managers through documenting performance, providing coaching and feedback, managing goals, writing performance reviews, and creating development plans. Meanwhile, OneForce/Performance’s Workscape employee performance management solution automates and streamlines all aspects of performance management while

According to Dessler (2011), numerous software systems allow employers to incorporate evaluations, career development, training, and succession planning. One is Kenexa CareerTracker, which assists organizations in enhancing their employees’ productivity by offering a reachable platform for continual employee performance management, succession planning and career development. One aspect in which HRIS have seen broad application is succession planning: the software development for this goal has been significant because it:

- helps to monitor and track management development;
- establishes candidate pools for inheritance;
- recognizes turnover factors among different levels of management;
- reacts to altering skills’ prerequisites;
- generates reports that provide answers to different questions about employers and their progress and
- provides a plethora of statistics in topics such as equal employment opportunity (EEO), career planning, and employee profiles (Miner & Crane, 1995).

The succession planning system is incorporated completely with other HRIS in the organization so that more information may be accessible from other sources and the outcome is a process capable of offering analyses that can match employers’ competencies with future business objectives. Hence, it is extremely difficult to rely on manual HR systems rather than computerizing HR functions and the entire organization’s tasks as the size of the organization grows and since there is a continual need for competing in a particular market or industry (Dessler, 2000). Following this line of thought, DeCenzo and
Robbins (2005), Bohlander and Snell (2004:463), Mathis and Jackson (1997:205) and Mello (2011:253) described the following HR functions and activities as presented:

**Recruiting:** advertising vacancies on the organization’s web sites or through other job-search web sites, such as Careerbuilder.com and Monster.com, aid HR managers in amassing a large number of applicants and deciding if an applicant has acquired necessary skills in technology.

**Employee selection:** employing effective individuals in technology-based organizations is very challenging because they demand people with technical and professional skills.

**Job descriptions and job specifications:** as computer technology has developed, academics have created computerized job analysis systems that can reduce time consumption and effort required in developing job descriptions. These systems can be utilized in job evaluation and rankings that are connected with pay structures. In addition, job specifications for each job can be developed, which can enhance recruiting, selection, training and other HR functions. Blending the administrative convenience of paper and pencil with the power of computerization, one of the new approaches is the Common-Metric Questionnaire (CMQ). The CMQ system consists of a computer-scannable document that is fed into computer-based scoring and is thereby able to report thousands of pieces of information about any job.

**Training and development:** technology is changing HRM trends. The internet has offered great opportunities in conveying particular information needed to both employees and employers. Automated technologies require more technically trained employees who act as trouble-shooters to repair, adjust or improve existing processes. Consequently, organizations have been able to reduce and, in some cases, eliminate, layers of management and move toward flatter
organization structures with fewer levels in the hierarchy. At the same time, because these technical workers have advanced training, the power bases in many organizations have been rearranged from management to technical workers.

**Benefits programmes:** online programs reduce the annual open registration period for numerous benefits. One big advantage from a benefit programme online is the major cost savings in benefits administration and the system is easy and inexpensive to adapt to individual needs. Descriptions of and advertisements for a variety of benefits software programmes are readily found in HR journals such as *Workforce* and *HRMagazine*. Software programmes represent a cost-effective way to manage employee benefits programmes where employers lack the resources or expertise to manage such programmes.

**Ethics and employee rights:** the emergence of various surveillance software programmes resulted in many ethical quandaries and employers are being questioned about what they should and should not be able to do when monitoring their employees.

**Motivating knowledge workers:** decision makers usually believe that they must monitor their employees’ electronic devices to save the organization’s resources, to make the employees more productive and to protect the organization from illegal practices or legal lawsuits.

In short, the melding of computer technology with HR functions and activities enabled organizations to develop more inclusive and precise job descriptions, more equitable compensation systems and performance evaluations and, as such, organizations can offer data that are more accurate for various quarters than ever before. Kumar and Pandya (2012) synthesized the following benefits that have been offered to organizations through technologies:
• intra-departmental cooperation: facilities online allowed HR departments to obtain employees from diverse cultural backgrounds and in different settings.
• inexpensive: containing costs (e.g., savings in printing, and transportation costs).
• accessibility to more information: authorized employees in organizations to access certain information and on a regular basis.
• better employee interaction: online tools enhanced communication among employees and employers that resulted in reduced social distance between them in various organizations.
• quick communication: online communication programmes enabled fast communication between employees and employers, which enhanced the efficiency of operations.
• document-trail and effective documentation: documentation has become unsophisticated since organizations could store, track and modify information in different locations, departments and offices, and have a healthier scrutiny and interpretation of the information garnered.
• greater feedback: electronic gadgets enhanced workers’ collaboration and allowed them to receive quick feedback from their employers.
• more focus group discussions: online mechanisms helped organizations in improving productivity and maximizing profits through electronic brainstorming and group discussions.

More precisely, there are three critical ways that IT influences HR functions. These are: (a) operational effects: automating routines tasks and lightening the administrative load; minimizing costs and enhancing productivity in the HR function itself. The most recurrent uses of IT in HR involve automating payroll processing, keeping employee data and managing benefit and compensation programmes; (b) relational effects: aside from the operational effects of IT that
accentuate efficiency and productivity enhancement within HR, IT also improves service by granting supervisory management and employees, access to HR databases, backing their HR critical decisions and improving coordination between and among departments in the organization and (c) transformational effects: the transformational effects of IT imply broadening the scope and functions of the HR department through restructuring all of the HR activities undertaken in the organization (Bohlander & Snell, 2004). Additionally, a computerized HRIS consists of computer hardware and software applications that function together to support HR decisions in the organization. Gomez-Mejia et al., (2004) observed that some HRIS software applications currently accessible to organizations are:

- **Employee information:** a programme that is used to establish a database that gives basic information about every employee, such as age, sex and race. Other application programmes can be used to reveal data from the employee information database for more in-depth HR uses.

- **Applicant tracking:** this programme is used to automate activities related to the recruitment and the selection of job candidates, including storing applicants’ information so that different employers can access it and evaluate the applicants’ interviews or update the status of the job applicant.

- **Skills inventory:** this is used to monitor or keep track of the demand for particular skills and match skills required with organizational needs. This programme can particularly enhance an organization’s promotion policy.

- **Payroll:** a payroll programme is used to compute gross pay and taxes and to make other calculations, such as paychecks for health insurance or retirement plans.

- **Benefit administration:** this programme is used to automate benefits record-keeping that may take a long time if done manually; it can also be used to manage different benefit programme or offer some
consultations about benefit options and provide benefits’ statements for each employee annually.

Miner and Crane (1995) listed the advantages of computerized HRIS as follows: (a) **speed**: computers can be used to manage a substantial amount of information in a short period, diminish the per-unit cost of information processing, deliver information that is advanced and promptly available and monitor activities as they arise by classifying real-time information; (b) **space**: HR records and documents require a great deal of space and these data files must be secured and protected; therefore, computer memories can be used to store information more effectively than conventional filing systems and (c) **availability**: employees and employers can use computers to eliminate or remove problems, develop mathematical theories that may determine solutions and quantifying and controlling information already saved in the computer can offer new insights into critical dilemmas. Moreover, a well-developed HRIS provides the following advantages: cost reduction of accumulated information in HR; advanced speed of data processing and retrieval; minimized efforts, which lead to cost reduction; accurate and timely data about HR are accessible; healthier analyses that enhance decision making; enhanced career planning and counseling; improved quality of documents and reports; rapid interaction with and management of environmental changes; and enhanced transparency in the whole system (Bhavsar, 2011). It has also been claimed that benefits of HRIS are fast responses, better access to information and a diminished workforce; a dearth of funds and skilled employees are considered major obstacles to implementing such a system (Batool, Sajid & Raza, 2012). In conclusion, HRIS must be perceived as a strategic weapon or else the system will not be used to its full capacity (Sadiq, Khan & Ikhlaq, 2012).

3. Technology in HRM (eHR)

The concept of eHR implies the application of managing HR issues through the use of computer technologies, including databases,
computer software and hardware, materials online and the internet as applied to all HR practices (Jackson et al., 2009). Development and application of eHR can be effective and strategic in the hands of HR professionals in organizations, if applied ethically to add maximum value to the organization. Some eHR applications and developments include the following:

- Employees can research or investigate companies, industries and other stakeholders online.
- Employees can register and choose specific items in a benefit package online.
- Employees can determine answers to HR queries and access their organization’s news stories.
- Employees in diverse settings around the world can work together cohesively.
- Employees who work in different subsidiaries can receive their organization’s training courses simultaneously over the organization’s computer network.
- Employees can use their organization’s intranets to generate automated pay sheets, which are an online substitute to time cards.
- Organizations can locate skilled and talented employees regardless of their locations, through job hunters on some of the top websites.
- Organizations can publish electronic employee handbooks and newsletters and create discussion groups or forums.
- Organizations can utilize websites that might be helpful in employee self-assessment, such as CareerMaze, which provides an evaluation of every job seeker, and his/her interests, strengths, and weaknesses or Career-intelligence, which is a career resource link that provides career-assessment planning information and other evaluation tools. Other services provide tools for writing CVs or cover letters and so forth.
- Organizations can make hiring decisions through a videoconference or chat programme on the internet that might save them travel costs and other expenditures.
• Organizations and chief information officers (CIOs) can use information technology in other corporations and align them with their organization’s strategic goals. In addition, CIOs work closely with chief executive officers (CEOs) to improve the strategic use of computer technologies that may position the organization in a competitive place in the market.

• Organizations can develop online surveys of employee satisfaction level, which can be efficient questionnaires that are easy to complete (Noe et al., 2007; Dessler, 2000; Mondy & Mondy, 2008; O’Brien & Marakas, 2006).

Since all kinds of information related to an organization’s HR may be employed, a computerized system may be used for substantial objectives (Miner & Crane, 1995). For example, performance evaluation software is used to incorporate organizational goals and management competencies, build a strategy for employee career development, automate performance management workflow, create e-mail reminders and develop an employee evaluation structure (Kumar & Pandya, 2012).

Owing to the confidentiality of HR information, many organizations develop an intranet that uses internet technology to allow access to official users only (Noe et al., 2007). However, organizations and HR departments are responsible for educating employees regarding how to work in this changing environment, how to cope with new trends and obtain the utmost benefits from such training, career development, performance management and other benefits. Succinctly, eHR provides useful ways to enact HR functions and achieve an organization’s mission, vision and strategic plans but also poses new challenges to both employees and employers. Hence, eHR systems offer great benefits to employees and organizations, along with challenges and barriers that need to be taken into account, to obtain the desired outcome from investing in such systems.
Additionally, technology has produced three innovative issues of concern for HR and organizations. Mello (2006) thoroughly illustrated the three issues as follows:

1. **Telecommuting** is described as individuals working from home through computer-mediated systems. This has been made possible by the great progress that has been made in information processing and advances in telecommunication technologies. Telecommuting is more than a contract between employees and their bosses, it also involves a vigilant management system that shows employees how to accomplish their tasks effectively and efficiently. Telecommuting can allow employees to take several roles because of their flexible work hours; when deciding to relocate, it can help organizations in retaining their employees, who are not able to change locations; it enables organizations to access a broader potential applicant pool; it can save a great deal of expenditure for organizations and some argue that it dramatically boosts productivity and reduces absenteeism and turnover rate. Nevertheless, a lucid and comprehensive performance appraisal system that has a set of measurable outcomes is fundamental for an effective telecommuting scheme.

2. **Employee monitoring and surveillance**: there is nearly consensus among employees and employers that technology, specifically access to the Internet, has improved employee skills related to job performance. However, alternatively, it has been shown in numerous studies that a large number of employees use the organization’s computers and the internet in visiting adult websites, shopping, conducting private business, chatting and playing games during their working hours. Consequently, many employers have developed electronic monitoring systems to monitor employee behaviour during the working day. In addition, many software programmes have been developed to allow employers to monitor employee e-mails, computer files, voice-mails and telephone usage. This has increased tension between employees and employers and poses serious questions concerning how far an employer can go in monitoring employees,
because many employees considered monitoring an invasion of privacy.

3. *eHR*: advances in technology have offered HR departments a plethora of opportunities to enhance organizations’ strategic goals. For example, HR departments can now provide many services on the internet and perform almost all of its functions and activities online (e.g., payroll, performance evaluations, employee pensions, savings and other benefits, employee relations and grievance handling, discrimination complaints, recordkeeping and reporting, training and development, staffing, action plans, safety and health development programmes).

Strohmeier (2007) and Sadiq, Khan and Ikhlaq (2012) proclaimed that eHR is a newborn with a very humble historical foundation and occupies a thought-provoking area of analysis at the intersection of HR and IS. Yusoff, Ramayah and Ibrahim (2010:3044) found that eHR is being applied progressively by organizations in the U.S. and other nations, although “… their use is often predicated on unproven claims about their antecedents.” Hence, they recommended that scholars and practitioners test various variables in HRIS, to promote the welfare of both individuals and organizations. Strohmeier (2007) thoroughly described significant implications for future developments in eHR. First, a theoretical foundation is the vital requirement of any advancement in the field and it is also necessary to focus on a small number of theories in HRM and IS to establish the most relevant approach for the future. Second, pluralism may be relevant when referring to experimental methods. Finally, future studies should openly deal with an inclusive analysis of an organization to avoid any downsides of lack of knowledge and unawareness.
4. HRIS Issues and Challenges Related to Technology

Technology has become an important part of many occupations, but how individuals of different ages learn and use technology presents a significant challenge for many organizations. According to Mathis and Jackson (2003), an HRIS supplies two central objectives and challenges in organizations. One involves administrative and operational efficiency: many HR activities can be implemented more efficiently if automated and valuable information is available whenever required. The other involves effectiveness: having reachable data assists HR planning and managerial decision making to rely on information rather than on managerial perceptions. Mondy and Mondy (2008:9) added that the world has never before seen technological changes occur as rapidly as they are today. The development of HR technology has created new roles for HR professionals but also places additional pressures on them to keep abreast of the technology. According to a survey by the Society for Human Resource Management (SHRM), a leading trend identified by the panel of experts was the expanded use of the Web for delivery and utilization of HR applications on a service basis.

The use of Web-based information systems enabled HR departments to be more efficient and to manage more HR planning and strategic issues for longer horizons. However, there are many challenges that should be taken into consideration and, therefore, Mathis and Jackson (2003) compiled and presented a web-based HRIS with the following features:

- **Bulletin boards**: information on individual policies, job advertisements and training resources can be reached by employees around the world.
- **Data access**: an extranet or intranet permits employees to access an abundance of information (e.g., benefit packages), which
saves time for HR employees who used to answer employee questions.

- **Employee self-service**: many intranets include employee self-service options where employees can update and modify their private information and enroll in employee benefits plans. In this case, maintaining security is vital.

- **Extended linkage**: integrating extranets and intranets help employers to be connected so that data can be exchanged electronically and employees can submit personnel records directly from any geographical location.

In short, DeCenzo and Robbins (2005:7) noted that “Digital electronics, optical data storage, more powerful and portable computers, and computers’ ability to communicate with each other are changing the way information is created, stored, used, and shared.” One immense challenge for HR departments is the increasing number of virtual workers who may undertake their tasks at home, coffee shops, hotels or wherever convenient to them (Bohlander & Snell, 2004). Organizations today must adopt new technologies or attempt to develop their own to operate more efficiently and reduce their competitive pressures. Yet, the allocation of the budget to adopt new technology must comply with significant strategic matters, particularly the strategic HR dimensions (e.g., training needs, a planned change process or hiring and recruiting new staff). Another extensive challenge for many organizations (Mello 2006, 2011) is that technological transformation leads to a more hierarchical structure that requires team building across different occupations, such as managing directors, technicians and analysts to accomplish such a project. Alternatively, technology has built more dynamic and flexible organizational structures that enhanced change resistance in the organization’s environment. If organizations desire to remain competitive in the market, advances in technology generally lead to restructuring of jobs and organizational structures, redesigns of benefits and compensation plans, rewriting of job descriptions, redesigns of employee selection and evaluation systems and new
training programmes with new techniques (Dessler, 2000; Mishra & Akman, 2010). In fact, Shaikh (2012) reported that organizations have been restructured through downsizing, rightsizing and re-engineering, which removed a large number of workers and enhanced communications; nevertheless, proper information management and communication planning are viewed as being the most crucial aspects to meet employee needs and expectations. Singh (2012) also confirmed that a successful execution of HRIS entails re-engineering of all business processes and activities, as well as effective synchronization between HR functions and the IT scheme.

Similarly, Noe et al. (2007) write that, given the rapidly changing pace of technology, organizations should continually modernize and refurbish their skill requirements and then select and train employees to meet those requirements. In other words, HRM has become more composite because of the increasing growth in specialized jobs, the call for promoting and training employees with high competencies and the growing multiplicity of benefit packages and programmes. Oz (2009) classified HRM into five major functions: (a) employee record management: IS ease employee record supervision for a variety of purposes, such as payroll, taxes and promotions and many HRIS are completely digitized, which minimizes the space required to store such data, the time needed to access them and the costs of both; (b) promotion and recruitment: HR managers can look for a database of job seekers and current employee profiles to choose the skilled candidates for specific jobs. Automating the employee selection task can reduce time and budget allocated for the recruitment process. Intranets also assist HR managers in advertising vacancies and urgent announcements; (c) training: training software simulates scenarios in which employees must take actions to evaluate a trainee’s competencies. Advances in IT helped organizations to control training costs to a great extent; (d) evaluation: by standardizing the evaluation process among employees and across departments, evaluation software can be used to determine the most qualified candidate for promotion, can reduce any bias in the process and can make it more
subjective and consistent. In addition, software helps employers in providing systematic analysis to develop performance reviews, a checklist of performance areas and measures to exhibit how competent the employee is in each task of the job performed and (e) compensation and benefits management: IS help HR departments in analyzing weekly, monthly and hourly pay based on annual salaries and can include tax tables to help in conforming with compensation regulations. This system can generate paychecks and transfer funds from the organization’s bank account to the employees electronically. Unique software helps HR departments managing benefits (e.g., health and life insurance, retirement pensions or sick and personal days). Some organizations use expert systems that specify the premium health and retirement pensions for each employee based on data (e.g., marital status, age and other factors).

Other major challenges for organizations involve the selection of hardware, software and IT services, which may require suppliers to offer some plans, according to the organization’s system development. The following is a compendium of major hardware evaluation aspects and selected software evaluation factors, as O’Brien and Marakas (2006) reported: hardware evaluation factors involve: performance (i.e., efficiency and power); cost (i.e., lease, purchase, operations and maintenance costs); reliability (i.e., risks involved, maintenance prerequisites, managing errors and analytical tools); compatibility (i.e., harmony with current software and hardware, with regard to what is provided by rival suppliers); technology (i.e., what kind of technology is applied, more recent or longstanding ones); ergonomics (i.e., user friendly, safe, comfortable and easy to use); connectivity (i.e., how easy it is to link with different kinds of network technologies); scalability (i.e., how far it can handle processes, transactions and different information processing obligations); software (i.e., the availability of software applications that can best apply this hardware) and support (i.e., the ease to obtain the services required for any support or maintenance required). O’Brien and Marakas (2006) also articulated software evaluation factors, as
follows: quality (i.e., frequency of errors in the programme);

efficiency (i.e., issues related to time consumption, memory
requirements or disk space); flexibility (i.e., the degree of flexibility in
changing some processes in the organization); security (i.e.,
procedures for managing errors, malfunctions and inappropriate use);
connectivity (i.e., how easy it is to connect to the internet, intranets
and extranets on its own or whether it should be connected with other
networks); maintenance (i.e., software developers’ level of
competencies and capabilities to fix unexpected errors);
documentation (i.e., how well the software is documented and
whether it contains helpful software agents); hardware (i.e., whether
the software required matches the existing hardware features) and
other factors (e.g., cost, reliability, availability and support features).

Other factors for IS services and the quality of support services
organization users may need include: performance (i.e., their
performance history with regard to their past guarantees); system
development (i.e., whether websites and e-business developers are
accessible and what their quality and cost are); maintenance (i.e., the
availability of equipment maintenance and their quality and cost);
conversion (i.e., what systems development and services will be
offered in the conversion period); training (i.e., the quality and cost of
training personnel and whether it can be provided or not); backup (i.e.,
the ease to obtain computer facilities whenever needed for backup
purposes); accessibility (i.e., whether vendors provide local sites that
offer sales, systems development and maintenance services); business
position (i.e., whether vendors have good industry market visions);
hardware (i.e., whether they provide many options of hardware tools
and accessories) and software (i.e., whether they provide practical e-
business software and application packages).

In brief, organizations also face substantial challenges concerning the
security and privacy of HRIS records:
• Authorizing specific users to access the HRIS records and data files or even distort some data whenever required, so that they are not obvious to authorized users.
• Developing passwords and special codes to allow users to access different segments of the database and prohibit them from accessing sensitive information.
• Authorizing access to employee profiles for specific business purposes determined by decision makers.
• Revealing and communicating the organization’s policies and plans to all employees concerning the use of their private information and explicitly inform them about the extent to which they can utilize this information.
• Granting employees the right to access their personal records to ensure relevancy and accuracy and take some corrective actions if necessary (Gomez-Mejia et al., 2004).

In conclusion, privacy, security and controlling methods are imperative for circumventing illegal or irrelevant access and usage of the HRIS system; training those who will be working in the HRIS system is critical to the effectiveness of the system and hardware and software vendor proficiency is also of great concern in providing appropriate support and instructions to stakeholders.

5. Recommendations for Further Studies

The author of this paper wishes to stimulate further debate and research related to the following: (a) what sort of information is most sought about employees in organizations and for what purposes; (b) how will the output from this information be presented to decision makers and (c) how often is this information needed by employers? Moreover, it would be useful to discover how employers can recognize the capabilities of an HRIS and the efforts needed before and after the installment of the system. Another intriguing area of research could be related to the level and the capacity of HRIS in facing crises or natural disasters. Another gap in the existing HR and...
HRIS literatures concerns the focus on the use of IT in organizations, without an analysis or an indication of whether the system is closed, open or quasi-open. An investigation of HRIS in organizations and perceptions of individuals from different cultural backgrounds (e.g., a comparative study between Eastern and Western nations or a study in a cross-cultural environment) may add to the existing studies in HR. In addition, there is little research concerning outsourcing HRIS and the effects that this might have on the organization’s culture as well as HRIS effects on employee behaviour and performance under such circumstances. Ultimately, more research is needed about the privacy and security challenges confronted by an HRIS because of major concerns for HR and IT professionals in organizations; however, researchers should carefully consider a particular country’s laws and constitution regarding privacy and security issues.

6. Implications for Practitioners

A large number of authors have written that organizations must highlight weaknesses encountered by HRIS, which include employee monitoring, compensation and benefits management, employee coordination with other departments and organizations and management skills. Consequently, this author has argued that several implications could be important to business operations and decision makers in organizations, the expansion of e-recruitment and e-learning; periodically assess the return on investment (ROI) for HRIS; ensure and develop the HR information privacy system; boost the outsourcing of HRIS; improve the level of management competencies; train employees how to provide information that assists employers in making appropriate decisions; the system should fit the organizational culture; scrupulously assess the organization’s needs to purchase the most suitable size and type of product from vendors because not all organizations require a sophisticated system; develop harmony and a good working environment between the HR department and the IT department to work cohesively and produce the desired outcome; decision makers should encourage HR and IT individuals in
organizations to attend trade shows and regular courses in IT to update their technological skills, as well as develop connections with software and hardware vendors. In short, HR departments can be strategic and business partners by evaluating: (a) their own effectiveness in how they apply technology in every-day work and (b) how fast they can cope with new technologies to enhance productivity and the efficiency of operations. Most importantly, HR specialists should facilitate the integration of HRIS tools and HRM functions with the organization’s mission and vision so as to enhance knowledge and training in IT and contribute to the development of the whole system in the organization.

7. Conclusion

Applying HRIS apparatus in HR departments and business operations helps reduce the burden of the administrative work routine, optimizes an organization’s financial status, provides access to accurate and timely information, improves the efficiency of operations, develops employees and employers’ individual and institutional competencies, identifies weaknesses in the organization’s system overall, builds effective strategies that add value to the organization, anticipates future threats, develops sustainable growth and long-term business goals and, subsequently, maintains and retains a competitive position in the market. An HRIS system consists of several subsystems (e.g., recruiting subsystem, compensation and benefits subsystem, planning subsystem, performance evaluation subsystem, environmental reporting subsystem, employee relations subsystem, payroll subsystem and training and development subsystem); hence, organizations should optimize these subsystems to make the whole system run well. In other words, deficiencies in any subsystem within an organization may result in a feckless system overall. Above all, HR departments vary from one another and it is always critical to identify the role of the HR department in the organization; some serve as strategic and business partners; whereas, others are focused on personnel or play the role of employee advocate only.
8. References


