

Human Resource Information Systems (HRIS) of Developing Countries in 21st Century: Review and Prospects

G. M. Azmal Ali Quaasar, Md. Siddikur Rahman

Department of Management Studies, Comilla University, Cumilla, Bangladesh
Email: gmquaasar@gmail.com, srahmancou143@yahoo.com

How to cite this paper: Quaasar, G. M. A. A., & Rahman, Md. S. (2021). Human Resource Information Systems (HRIS) of Developing Countries in 21st Century: Review and Prospects. *Journal of Human Resource and Sustainability Studies*, 9, 470-483.
<https://doi.org/10.4236/jhrss.2021.93030>

Received: August 6, 2021

Accepted: September 13, 2021

Published: September 16, 2021

Copyright © 2021 by author(s) and Scientific Research Publishing Inc. This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

The role of Human resource management (HRM) has shifted overall from traditional (popularly called personnel management) to a strategic one. HRIS outline the amalgamation between HRM and IS. HRIS is one of the best neoteric HR tools in modern organizations. It became popular in developed countries since the beginning of this century. However, only few corporate organizations and MNCs in developing countries like Bangladesh have started to adopt and use HRIS since this decade. But still its adoption and usages are limited to few mid to large sized organizations. This research is primarily concerned with identifying the applications of human resource information systems (HRIS) in various businesses, as well as their outcomes. This study also aims to provide the useful information about the major barriers in adoption of HRIS to be concerned with. And finally, it describes knowledge acquisition of HRIS and its scope to take a decision regarding its extension.

Keywords

HRIS, Adoption, Developing Country, HRIS Applications, Barriers

1. Introduction

In the past two decades, globalization, rapid progress in technology, the advent of the knowledge-based economy has changed the way of operations of modern organizations, and the significance of adoption of information technology in organizations has increased up at an exponential rate. Nardi and O'Day (1999), noted that the introduction of the new technology impacts the nature of activities, commerce, school, politics, family life, and also war. It also affects employees and their workplaces, job design, HR planning, and the conditions of work in

organizations (Baloh & Trkman, 2003). Considering these trending forces, typical HR management systems are mostly inefficient (Beckers & Bsat, 2002). Integrated IS, particularly HRIS, increases the productivity and service quality with less operating cost (Zainol, Fernandez, & Ahmad, 2017) and also facilitates strategic decision-making of organization with competitive advantage (Moussa & El Arbi, 2020). Eventually, all the forces mentioned above are making a crucial impact on the actions of human resource management (HRM) (Park, Gardner, & Wright, 2004; Purce, 2014).

IT-based operations are the part and parcels that various organizations are adapting to compete in a strategic way (Jenkins & Lloyd, 1985). Technology adoption is more intricate or slower in public sector than in the private (Nam, 2019). The HR managers of their respective organizations become a strategic business partner. Based on the interaction between IT and HR, HR technology (namely HRIS) is coming out as an emerging field that could propel human resource management into an unforeseen and modern era (Lin, 1997). Today the HR managers ignore the IT-based human resource activities its potential, and extensive use of HRIS has followed (Cedar Crestone, 2009). With the growing consciousness of the HRIS capabilities and activities, organizations are becoming more interested in its acquisition, execution, and utilization. In this process, awareness is required where the organizations need to understand the scope of HRIS and should study how it can be used effectively.

Bangladesh, as a growing economy, has marched to lower middle-income country passing through least development country (LDC). Now it has been a digital Bangladesh showing the dream of a developed country by 2041. Digital, technology, development is synonymous with Bangladesh. According to a survey by Japan International Cooperation Agency in 2008, Bangladesh, among the Asian countries, secured the first position in software and IT services competitiveness and the third position in competencies, just after India and China (Karim, 2010). In another study conducted by World Bank in 2008, a three digit growth was projected for Bangladesh in the areas of IT services and software exports (Karim, 2010). Today, Information Technology (IT) is an issue of common discussion in Bangladesh where various changes are happening in the IT sector of Bangladesh. This study considers where Bangladesh stands regarding IT applications and their execution especially in the HR field in public, private; small, medium; banks, insurance; local, global; all sorts of organizations.

A good numbers of research on HRIS have been done in last two decades. Some researchers have focused more on usages (Ball, 2001; Bamel, Bamel, Sahay, & Thite, 2014; Hussain, Wallace, & Cornelius, 2007; Kassim, Ramayah, & Kurnia, 2012; Maier, Laumer, Eckhardt, & Weitzel, 2013) etc. Some authors focus more on the conditions and other issues for successful implementation of HRIS (Haines & Petit, 1997; Winkler, König, & Kleinmann, 2013). Again, HRIS implementation based on areas also addressed by some researchers like (Ngai & Wat, 2006; Razali & Vrontis, 2010; Tansley & Newell, 2007; Teo, Lim, & Fedric, 2007). Authors agreed upon about satisfactory number of works on HRIS. How-

ever, most of the organizations have very limited understanding of HRIS, to some extent, the successful utilization and output of an HRIS.

This study divided into six sections and started with introduction where problem statements, research objectives and the significance of this study have been presented. For better and vigorous understanding, previous studies have been depicted in second. HRIS applications in different organizations and its outcomes have been focused in third section. In section four, challenges of HRIS adoption and implementation have been shown. It also explains about the extent of HRIS, by how HR professionals easily understand about the benefits and barriers of HRIS implementation better in section five and finally, this study finished with the contributions and conclusion.

2. Literature Review

HRM started to use technology in 1940s (DeSanctis, 1986). The significance and benefits of this technology was not recognized before 1990s. However, it set the platform for an increase of changes since the 1960s (Kavanagh, Gueutal, & Tannenbaum, 1990; Lederer, 1984). Human Resource Information System (HRIS) is a system to obtain, store, recover, analyze, and disseminate information about an organization's human resource (Tannenbaum, 1990). It is not a simply computer hardware associated with human resource related software; it also consists of people, policies and procedures, forms, and data. The greater the human capability, the greater the learning capability of employees; leading sequentially to developed workers' innovative capability (Moussa & El Arbi, 2020). The innovation capability of HRIS in an organization hinges upon the improvement of the strategic people and management as well (Mauro & Borges-Andrade, 2020).

According to Hendrickson (2003), HRIS is regarded as the backbone of contemporary HRM function and HRIS could be benefited by the processes of increasing efficiency, effectiveness and training support. This IT system is used for gathering, storing, maintaining, analyzing, and recovering an organization's necessary information about its all employees. The major task of HRIS is to gather and facilitate analyzing the data required for human resource management department to perform its job correctly (Anthony, Kacmar, & Perrewe, 2002; Weeks, 2013).

During the period 1980 to early 1999 (Cost-Effectiveness Era), managers of few companies found that more than 80% of operating cost is required for personnel costs. As a result, managers and owners badly felt for the HRM functions to minimize the cost for employees program as well as services and the first book was written to address this rising need to cost justify the HRM tasks (Cascio, 1984). Prior to the 20th century and before the World War II, personnel function (the antecedent of human resources management) was mostly the function of keeping records on employee information and at that time that was philosophy called as "scientific management". The prime concern of scientific management was to make the most of employee productivity. Cascio (1991) figures Fitz-Enz (1979), who more precisely narrate the need for human resource man-

agement to minimize the cost of their functions.

This age is Technological Advancement age of Strategic HRM (1990 to Present) and HRIS is important for developing and modernizing the HR functions. [Laval and Diallo \(2007\)](#), pointed out triple impacts of ICT on HR functions and these results were supported by [\(Reddick, 2009\)](#). Today's firm realizes that creative and innovative employees are the key factors for the sustainable competitive advantage as it is hard to imitate by the competitors like other resources. These changes have led to the formation of the human resource balanced scorecard ([Beckers & Bsath, 2002](#); [Huselid & Becker, 2005](#)) and it is emphasized by the return on investment (ROI) of human resource functions and its program ([Cascio, 2000](#); [Fitz-Enz, 1979](#)).

In this current global age, employing organizations as well as their working environments have become incrementally intricate. Managers of such kind of organizations are facing difficulties to cope with the workforces from different countries, cultures, and also creeds. Given such propensities, manual HR process management is entirely insufficient ([Beckers & Bsath, 2002](#)). To make the organization success, it's the timely demand to know the HRIS and its applications to all HR professionals and organizations as well. However, it is a challenging issue for IT/IS research to make the people understand, why they adopt or avoid information technology ([Al-Adawi, Yousafzai, & Pallister, 2005](#)).

3. HRIS Applications

HRIS is important to the success of HR functions ([Madhuchanda & Tripathy, 2009](#)). Individual assessment of HRIS applications influence HRM technical and strategic ([Ruel, Bondarouk, & Velde, 2007](#)). The following applications of HRIS are addressed under:

3.1. Recruitment and Selection

One of the most significant objectives of HR is to attract, select and keep the brilliant workforces in the organizations in their roles ([Katz & Kahn, 1978](#)). HRIS has a greatest contribution to HR planning through HRIS skills' inventory, labor demand and supply analysis, training needs analysis and HRIS succession planning ([Nagendra & Deshpande, 2014](#)). Recent years various researchers have pointed that employee recruitment process and practice have shifted from existing to the modern method ([Schouten, Oostrom, Pestman, Peters, & Jennekens-Schinkel, 2002](#)). HRIS is very applicable in the selection process. HR professionals are responsible for the job analysis and to prepare the job description. The job description is highly recommended to recruit and select right individuals. The e-Recruiting is HR technique available to Human Resource professional which is incorporated with an information system in HR.

3.2. Training and Development

HR professionals are also responsible for improving the knowledge, skills, and

abilities of employees throughout training and development. HRIS can help employees in an organization to get training and development program to perform in better way (Jahan, 2014). Training technologies, trainee characteristics with their performances and training design are significant before providing or arranging training and development program. Learning Management System (LMS) permits HRD to trail education, skills and other qualifications of the personnel and outlines the appropriate training courses, books, CDs or others learning materials to develop their required skills. Complex LMS lets HR managers' support training and scheduling along with performance management and appraisal metrics. Web-based training (WBT) is a conventional technique to be self-educated using computer programs and intricate web network. The rapid advancement of web technologies provides a great opportunity for the enhancement of training support applications. Web-based HRIS application offers self-run accessibility towards HR managers and personnel for two-way communication using the Internet (Meade, 2000).

3.3. Payroll Administration

Two types of purposes are seen in HRIS (Martinsons, 1994; Ruël, Bondarouk, & Looise, 2004), one is administrative and another one is payroll benefits (Kinnie & Arthurs, 1996; Teo, Soon, & Fedric, 2001). The payroll is a process by which employees are paid by their employers for employment. The payroll module was developed to assist the HR professionals in calculating the actual pay to their employees. This system automatically works to calculate the actual pay of employees through collecting data on employees' time and production, and by calculating different deduction and taxes, and then creates pay cheques and tax reports periodically. This unit deals with all staff-related payments and collects data from finance divisions. Payroll is one of the goal of HRIS (Gupta, 2013). The traditional payroll system was time-consuming and had a chance to make error. It's a process where payroll staffs just need to enter the working hours or productions of employees and then systems will process a series of necessary actions to calculate the financial data of employees for HR department.

3.4. Benefits and Compensation Management

Employees' benefits policies and compensation management of an organization require a significant number of written works and information. It is a difficult task that can be performed more efficiently and simply with the help of HRIS. This automating system can easily manage the employees' salary and promotion dates, generate reports for HR managers to appraise employees. It helps to input data and all benefits and deductions can be generated on the payroll side promptly. By this way, paper flow and the communication between payroll staffs and HR can be reduced. By the automating benefits system using in HRIS, organizations may save time and reduce the numbers of errors.

Compensation Management usually includes compensation, insurance, profit

sharing and retirement funds. All kinds of information, especially the nature of the sickness or accident, medical reports, regulations of controlling staff behavior, the individuals implicated and government information, etc. is required to collect and administer in this process (Hendrickson, 2003). The system allows employees with the help of internet to review the information about the deductions, interruption of salaries and accumulated balance. Organizations collect information on wages, remuneration as well as other welfares to rationalize entry to salary, benefits as well as compensation management online.

3.5. Performance Appraisal

Performance appraisal is a process which evaluates an employee's or workers' job performance and productivity systematic and regular way on the basis of preset objectives (Manasa & Reddy, 2009). Performance Appraisal management has been changed radically in many organizations with the development of HRIS modules and tools from last two decades. Annual performance assessments and evaluations are not so effective to motivate employees and to increase their productivity, so HR professionals are looking for something new that will be more effective. Many systems are working to ensure the employee involvement in the performance management and HRIS is one of the best techniques. In HRIS, employees can check their performance periodically and get the opportunities to find out their productivity rate and to improve their productivity. HRIS has a great impact to improve the individual's performance and productivity (Hosnavi & Ramezan, 2010; Reddick, 2009). Performance reviews also become immediately available to all stakeholders like top management, supervisors, clients, and others.

3.6. HR Planning

Laval and Diallo (2007), found that HRIS has impacts on strategic and operational functions of human resources. The vital role of HR is to incorporate planning and to control of human resources with the cost and production into the corporate level plan. An effective HR planning can make sure the required competent personnel in right job in right time and HRIS can perform here rightly. According to (Nagendra & Deshpande, 2014), the highest contributions of HRIS is to develop an effective and competence HR planning for the organizations with the HRIS skills' inventory, HRIS succession planning, HRIS training needs analysis and HRIS labor supply and demand analysis.

3.7. Internal and External Communication

The internet and intranets effectively arrange channels for the organizations to enhance the practice of internal and external communications. Concerning the internal communication, employees of an organization can communicate with everyone in the hierarchic in a firm. They can get easy access to updated and pertinent information using the internet. Also, the employees can also use the

internet to be connected with the up-to-date and pertinent data across different units in different branches, including global branches (Karakanian, 2000).

3.8. Employee Self Service Systems (ESS)

Employee self-service Systems (ESS) is a very popular method that uses an internet-based technology where staffs are provided access to the secure centralized HR database and permit them to evaluate their data, check their benefits enrolment, partake in new enrolment, and also register for training (Marler & Dulebohn, 2005). According to (Cedar Crestone, 2009) on some estimation, indicated that more than 80% of large organizations are using ESS or have a plan to use ESS very soon. According to an interesting study of Hawking, Stein, and Foster (2004), there are several benefits and attention regarding the use of ESS systems. Firstly, ESS is positively connected to reduce the processing time, have a good chance to take the right decisions, and can improve productivity. Secondly, 80% of employees accept this new system after getting well trained to use the system. Thirdly, the use of ESS can change the role of managers and top-level management and stimulated them to use the system for their everyday tasks. The system provides the latest information about the employees and organization.

4. Barriers of Adopting HRIS

Beside benefit of adopting and implementing HRIS, there are some obstacles for HR professionals because of high conversion cost from manual to automated HRM, inadequate training for employees, lack infrastructure and technical knowledge (Zafar, 2013).

- The attitude of Top Management: in Bangladesh, top management treats HRIS is a valued system whereas some other do not think so (Mursalin, 2015). However, Top management support can simplifies the relationship within the technology adoption and the ingenuity of service innovation (Hsu, Liu, Tsou, & Chen, 2019) and it has a great influence in technology adoption (Ram-rez & López-Zapata, 2021).
- Lack of adequate training for the HR professionals: to use a system successfully, training is important for all levels of employees to develop their knowledge and skills (Quaosar, 2018; Troshani, Jerram, & Hill, 2011). To be adroit in Information system it requires training and technical support for users and its very important (Bala & Venkatesh, 2013). Lack of this training support is one of the major barriers in Bangladesh.
- Lack moral support from top managers: top management is ambitious to achieve organization's goals and provides all support-financial and technical to its employees. HRIS is flourished and developed if HR professionals are able to grant moral support from top management. Supportive climate with providing adequate resources from top management are important in technology adoption (Hartono, Li, Na, & Simpson, 2010; Premkumar & Roberts, 1999; Quaosar, 2017).

- Low knowledge, skill and experience of users: experience is important in technology adoption (Hashim, 2015). According to Elliott and Tevavichulada (1999), HRIS employees should have multidisciplinary skills with the knowledge of IS and HR functions. But in Bangladesh employees are not enough knowledgeable and skillful. And even they are intrinsically eager to learn more and more.
- Organizational Size: organizational size depends on the volumes of transactions, on organization's resources, or workforce size (Kimberly & Evanisko, 1981). Economic condition or status of an organization depends on organizational size. It is an important factor in technology adoption (Andaregie & Astatkie, 2021; Lippert & Govindarajulu, 2015) and organizations' eagerness to adopt technology is positively associated organizational size (Damanpour, 1992; Lippert & Govindarajulu, 2015).
- Lack of sufficient fund: Dearth of sufficient fund which is supposed to be sanctioned by top management is common and major barriers to HRIS adoption (Kumar Bhardwaj, Garg, & Gajpal, 2021). Budget sanctioned for HRIS has a significant role in HRM (Mursalin, 2015). Hence, Kovach and Cathcart (1999), mentioned expenditure for HRIS as an investment. In Bangladesh, a negligible number of organizations allocate more than 0% of the annual budget for HRIS (Mursalin, 2015).

5. Extent of HRIS

Extension of HRIS would be possible when the organization will be able to realize the purposes of HRIS in the organization and its outcome. HRIS is basically used in the organization for the administrative and pay benefit purposes (Kinnie & Arthurs, 1996; Teo et al., 2001). It's a sophisticated technology in an organization to make the HR activities more effective and efficient. HRIS is treated as the backbone of contemporary HRM functions (Hendrickson, 2003). HRIS is significant in an organization, for recruitment and selection, training and development, payroll administration, compensation management, performance appraisal, HR planning, etc. These issues cover the extent of HRIS in an organization. Favorable event approaches better adoption and extent of HRIS.

There are two types of purposes of HRIS (Martinsons, 1994; Ruël et al., 2004). These are administrative and payroll benefits (Kinnie & Arthurs, 1996; Teo et al., 2001). If they adopt simple automation tasks in HR, it is regarded as "unsophisticated" HRIS (Martinsons, 1994) and he observes that different software of HRIS is used in "recruitment, selection, training, development, HR planning, performance appraisals and rewards" and this has been named as the "sophisticated" HRIS. A study currently conducted in India expressed that "sophisticated" HRIS had also been moderately in function (Saharan & Jafri, 2012).

6. Contributions and Conclusion

The research has the potential to have both theoretical and practical applica-

tions. This research can be seen as a contribution to a more integrative investigation of human resource information system. On the practical side, this research will help the HR professional to know about the benefits or usages of HRIS and also the findings of this research have significance to find out the barriers in adoption of HRIS to be more concerned. Additionally, the study wishes to emphasize that forward-looking firms put in place a comprehensive strategy to human resource information system management and also deliver quality information to those making decisions.

HRIS is a system to gather, store, analyze, and communicate information on an organization's human resources. HRIS could benefit from practices that improve efficiency, effectiveness, and training support. By automating their benefits systems with the HRIS, businesses can save time and reduce errors. Using Employee Self-Service Systems has led managers and the highest levels of management to use the system on a daily basis. The traditional payroll system was time-consuming and prone to errors, whereas HRIS automatically calculates employees' actual salaries. It makes it easier to enter data, and all benefits and deductions may be created quickly on the payroll side. The HRIS is one of the most effective methods for ensuring employee participation in performance management. High conversion costs from manual to automated HRM, inadequate training for employees, and a lack of infrastructure and technical knowledge. Lack of adequate funding, which is supposed to be sanctioned by top management, is common and is a major impediment to the effectiveness of HRIS. HRIS is used in the organization for administrative and pay benefit purposes. It is a sophisticated technology designed to improve the effectiveness and efficiency of HR activities. HR professionals use various applications to make the HR department accountable for the growth and success of their employees.

As the authors understand, this study has several limitations. This study was unable to cover all the publications on the topic of human resource information systems because of the chosen research procedure. On the other hand, it is assumed that the research evaluation process included published papers that were readily available.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- Al-Adawi, Z., Yousafzai, S., & Pallister, J. (2005). Conceptual Model of Citizen Adoption of E-Government. *Proceedings of the Second International Conference on Innovations in Information Technology (IIT'05)*, Dubai, 26-28 September 2005, 1-10.
- Andaregie, A., & Astatkie, T. (2021). Determinants of Technology Adoption by Micro and Small Enterprises (MSEs) in Awi Zone, Northwest Ethiopia. *African Journal of Science, Technology, Innovation and Development*, 1-10.
<https://doi.org/10.1080/20421338.2021.1923385>

- Anthony, W. P., Kacmar, K. M., & Perrewe, P. L. (2002). *Human Resource Management: A Strategic Approach* (4th ed.). Prentice Hall.
- Bala, H., & Venkatesh, V. (2013). Changes in Employees' Job Characteristics during an Enterprise System Implementation: A Latent Growth Modeling Perspective. *MIS Quarterly*, *37*, 1113-1140. <https://doi.org/10.25300/MISQ/2013/37.4.06>
- Ball, K. S. (2001). The Use of Human Resource Information Systems a Survey. *Personnel Review*, *30*, 677-693. <https://doi.org/10.1108/EUM000000005979>
- Baloh, P., & Trkman, P. (2003). Influence of Internet and Information Technology on Work and Human Resource Management. *Informing Science*, June, 498-505. <https://doi.org/10.28945/2642>
- Bamel, N., Bamel, U. K., Sahay, V., & Thite, M. (2014). Usage, Benefits and Barriers of Human Resource Information System in Universities. *The Journal of Information and Knowledge Management Systems*, *44*, 519-536. <https://doi.org/10.1108/VINE-04-2013-0024>
- Beckers, A. M., & Bsath, M. Z. (2002). A Dss Classification Model for Research in Human Resource Information Systems. *Information Systems Management*, *19*, 1-10. <https://doi.org/10.1201/1078/43201.19.3.20020601/37169.6>
- Cascio, W. F. (1984). *Costing Human Resources: The Financial Impact of Behavior in Organization*. PWS-Kent.
- Cascio, W. F. (1991). *Costing Human Resources* (Vol. 21). South-Western Educational Publishing.
- Cascio, W. F. (2000). *Costing Human Resources: The Financial Impact of Behavior in Organizations* (4th ed.). South-Western College.
- Cedar Crestone, C. (2009). *Cedar Crestone 2009-2010 HR Systems Survey: HR Technologies, Deployment Approaches, Value, and Metrics: USA*.
- Damanpour, F. (1992). Organizational Size and Innovation. *Organization Studies*, *13*, 375-402. <https://doi.org/10.1177/017084069201300304>
- DeSanctis, G. (1986). Human Resource Information Systems: A Current Assessment. *MIS Quarterly*, *10*, 15-27. <https://doi.org/10.2307/248875>
- Elliott, R. H., & Tevavichulada, S. (1999). Computer Literacy and Human Resource Management: A Public/Private Sector Comparison. *Public Personnel Management*, *28*, 259-274. <https://doi.org/10.1177/009102609902800207>
- Fitz-Enz, J. (1979). Quantifying the Human Resources Function. *Personnel*, *57*, 41-52.
- Gupta, B. (2013). Human Resource Information System (HRIS): Important Element of Current Scenario. *IOSR Journal of Business and Management*, *13*, 41-46. <https://doi.org/10.9790/487X-1364146>
- Haines, V. Y., & Petit, A. (1997). Conditions for Successful Human Resource Information Systems. *Human Resource Management*, *36*, 261-275. [https://doi.org/10.1002/\(SICI\)1099-050X\(199722\)36:2<261::AID-HRM7>3.0.CO;2-V](https://doi.org/10.1002/(SICI)1099-050X(199722)36:2<261::AID-HRM7>3.0.CO;2-V)
- Hartono, E., Li, X., Na, K.-S., & Simpson, J. T. (2010). The Role of the Quality of Shared Information in Interorganizational Systems Use. *International Journal of Information Management*, *30*, 399-407. <https://doi.org/10.1016/j.ijinfomgt.2010.02.007>
- Hashim, J. (2015). Information Communication Technology (ICT) Adoption among SME Owners in Malaysia. *International Journal of Business and Information*, *2*, 221-240.
- Hawking, P., Stein, A., & Foster, S. (2004). E-HR and Employee Self Service: A Case Study of a Victorian Public Sector Organisation. *Journal of Issues in Informing Science and Information Technology*, *1*, 1019-1026. <https://doi.org/10.28945/2757>

- Hendrickson, A. R. (2003). Human Resource Information Systems: Backbone Technology of Contemporary Human Resources. *Journal of Labor Research*, 24, 381-394. <https://doi.org/10.1007/s12122-003-1002-5>
- Hosnavi, R., & Ramezan, M. (2010). Measuring the Effectiveness of a Human Resource Information System in National Iranian Oil Company: An Empirical Assessment. *Education, Business and Society: Contemporary Middle Eastern Issues*, 3, 28-39. <https://doi.org/10.1108/17537981011022797>
- Hsu, H.-Y., Liu, F.-H., Tsou, H.-T., & Chen, L.-J. (2019). Openness of Technology Adoption, Top Management Support and Service Innovation: A Social Innovation Perspective. *Journal of Business & Industrial Marketing*, 34, 575-590. <https://doi.org/10.1108/JBIM-03-2017-0068>
- Huselid, M. A., & Becker, B. E. (2005). *The Workforce Scorecard: Managing Human Capital to Execute Strategy*. Harvard Business Review Press.
- Hussain, Z., Wallace, J., & Cornelius, N. E. (2007). The Use and Impact of Human Resource Information Systems on Human Resource Management Professionals. *Information & Management*, 44, 74-89. <https://doi.org/10.1016/j.im.2006.10.006>
- Jahan, S. S. (2014). Human Resources Information System (HRIS): A Theoretical Perspective. *Journal of Human Resource and Sustainability Studies*, 2, 33-39.
- Jenkins, M. L., & Lloyd, G. (1985). How Corporate Philosophy and Strategy Shape the Use of HR Information Systems. *Personnel*, 62, 28-38.
- Karakanian, M. (2000). Are Human Resources Departments Ready for e-HR? *Information Systems Management*, 17, 35-39. <https://doi.org/10.1201/1078/43193.17.4.20000901/31250.6>
- Karim, H. N. (2010). Bangladesh IT Industry Going Global. *The Daily Star*, 6.
- Kassim, N. M., Ramayah, T., & Kurnia, S. (2012). Antecedents and Outcomes of Human Resource Information System (HRIS) Use. *International Journal of Productivity and Management*, 61, 603-623. <https://doi.org/10.1108/17410401211249184>
- Katz, D., & Kahn, R. L. (1978). *The Social Psychology of Organizations* (2nd ed.). Wiley.
- Kavanagh, M. L., Gueutal, H. G., & Tannenbaum, S. I. (1990). *Human Resource Information Systems: Development and Application*. PWS-Kent Publishing Company.
- Kimberly, J. R., & Evanisko, M. J. (1981). Organizational Innovation: The Influence of Individual, Organizational, and Contextual Factors on Hospital Adoption of Technological and Administrative Innovations. *Academy of Management Journal*, 24, 689-713. <https://doi.org/10.5465/256170>
- Kinnie, N. J., & Arthurs, A. J. (1996). Personnel Specialists' Advanced Use of Information Technology Evidence and Explanations. *Personnel Review*, 25, 3-19. <https://doi.org/10.1108/00483489610147933>
- Kovach, D. K. A., & Cathcart, C. E. (1999). Human Resource Information Systems (HRIS): Providing Business with Rapid Data Access, Information Exchange and Strategic Advantage. *Public Personnel Management*, 28, 275-281. <https://doi.org/10.1177/009102609902800208>
- Kumar Bhardwaj, A., Garg, A., & Gajpal, Y. (2021). Determinants of Blockchain Technology Adoption in Supply Chains by Small and Medium Enterprises (SMEs) in India. *Mathematical Problems in Engineering*, 2021, Article ID: 5537395. <https://doi.org/10.1155/2021/5537395>
- Laval, F., & Diallo, A. T. (2007). L'e-RH: Un processus de modernisation de la gestion des ressources humaines à la mairie de Paris. *Management Avenir*, 3, 124-148. <https://doi.org/10.3917/mav.013.0124>

- Lederer, A. L. (1984). Planning and Developing a Human Resource Information System. The Logic of a Step-by-Step Approach. *The Personnel Administrator*, 29, 27-39.
- Lin, C. Y.-Y. (1997). Human Resource Information Systems: Implementation in Taiwan. *Research and Practice in Human Resource Management*, 5, 57-72.
- Lippert, S. K., & Govindarajulu, C. (2015). Technological, Organizational, and Environmental Antecedents to Web Services Adoption. *Communications of the IIMA*, 6, 14.
- Madhuchanda, M., & Tripathy, S. (2009). HRIS of Indian Scenario: Case Study of Large Organizations. *South Asian Journal of Management*, 16, 137-168.
- Maier, C., Laumer, S., Eckhardt, A., & Weitzel, T. (2013). Analyzing the Impact of HRIS Implementations on HR Personnel's Job Satisfaction and Turnover Intention. *The Journal of Strategic Information Systems*, 22, 193-207.
<https://doi.org/10.1016/j.jsis.2012.09.001>
- Manasa, K., & Reddy, N. (2009). *Role of Training in Improving Performance*.
- Marler, J. H., & Dulebohn, J. H. (2005). A Model of Employee Self-Service Technology Acceptance. In *Research in Personnel and Human Resources Management* (pp. 137-180). Emerald Group Publishing Limited.
[https://doi.org/10.1016/S0742-7301\(05\)24004-5](https://doi.org/10.1016/S0742-7301(05)24004-5)
- Martinsons, M. G. (1994). Benchmarking Human Resource Information Systems in Canada and Hong Kong. *Information & Management*, 26, 305-316.
[https://doi.org/10.1016/0378-7206\(94\)90028-0](https://doi.org/10.1016/0378-7206(94)90028-0)
- Mauro, T. G., & Borges-Andrade, J. E. (2020). Human Resource System as Innovation for Organisations. *Innovation & Management Review*.
<https://doi.org/10.1108/INMR-03-2019-0037>
- Meade, J. (2000). Web-Based HRIS Meets Multiple Needs. *HR Magazine*, August, 129-133.
- Moussa, N. B., & El Arbi, R. (2020). The Impact of Human Resources Information Systems on Individual Innovation Capability in Tunisian Companies: The Moderating Role of Affective Commitment. *European Research on Management and Business Economics*, 26, 18-25. <https://doi.org/10.1016/j.iemeen.2019.12.001>
- Mursalin, J. A. (2015). Adoption of Human Resource Information System: An Exploratory Study of Bangladesh *Journal of System and Management Sciences*, 5, 48-62
- Nagendra, A., & Deshpande, M. (2014). Human Resource Information Systems (HRIS) in HR Planning and Development in Mid to Large Sized Organizations. *Procedia-Social and Behavioral Sciences*, 133, 61-67. <https://doi.org/10.1016/j.sbspro.2014.04.169>
- Nam, T. (2019). Determinants of Local Public Employee Attitudes toward Government Innovation. *International Journal of Public Sector Management*, 32, 418-434.
<https://doi.org/10.1108/IJPSM-06-2018-0134>
- Nardi, B. A., & O'Day, V. (1999). *Information Ecologies: Using Technology with Heart*. MIT Press. <https://doi.org/10.7551/mitpress/3767.001.0001>
- Ngai, E. W. T., & Wat, F. K. T. (2006). Human Resource Information Systems a Review and Empirical Analysis. *Personnel Review*, 35, 297-314.
<https://doi.org/10.1108/00483480610656702>
- Park, H. J., Gardner, T. M., & Wright, P. M. (2004). HR Practices or HR Capabilities: Which Matters? Insights from the Asia Pacific Region. *Asia Pacific Journal of Human Resources*, 42, 260-273. <https://doi.org/10.1177/1038411104045394>
- Premkumar, G., & Roberts, M. (1999). Adoption of New Information Technologies in Rural Small Businesses. *Omega*, 27, 467-484.
[https://doi.org/10.1016/S0305-0483\(98\)00071-1](https://doi.org/10.1016/S0305-0483(98)00071-1)

- Purce, J. (2014). The Impact of Corporate Strategy on Human Resource Management. In *New Perspectives on Human Resource Management* (p. 67). Routledge.
- Quaosar, G. M. A. A. (2017). Determinants of the Adoption of Human Resources Information Systems in a Developing Country: An Empirical Study. *The International Technology Management Review*, 6, 82-93. <https://doi.org/10.2991/itm.2017.6.3.2>
- Quaosar, G. M. A. A. (2018). Adoption of Human Resource Information Systems in Developing Countries: An Empirical Study. *International Business Research*, 11, 133. <https://doi.org/10.5539/ibr.v11n4p133>
- Ram-rez, A. M. H., & López-Zapata, E. (2021). Analysis of the Factors Influencing Adoption of 3D Design Digital Technologies in Colombian Firms. *Journal of Enterprise Information Management*.
- Razali, M. Z., & Vrontis, D. (2010). The Reactions of Employees toward the Implementation of Human Resources Information Systems (HRIS) as a Planned Change Program: A Case Study in Malaysia. *Journal of Transnational Management*, 15, 229-245. <https://doi.org/10.1080/15475778.2010.504497>
- Reddick, C. G. (2009). Human Resources Information Systems in Texas City Governments: Scope and Perception of Its Effectiveness. *Public Personnel Management*, 38, 19-34. <https://doi.org/10.1177/009102600903800402>
- Ruel, H. J. M., Bondarouk, T. V., & Velde, M. V. D. (2007). The Contribution of e-HRM to HRM Effectiveness Results from a Quantitative Study in a Dutch Ministry. *Employee Relations*, 29, 280-291. <https://doi.org/10.1108/01425450710741757>
- Ruël, H., Bondarouk, T., & Looise, J. K. (2004). E-HRM: Innovation or Irritation. An Explorative Empirical Study in Five Large Companies on Web-Based HRM. *Management Revue*, 15, 364-380. <https://doi.org/10.5771/0935-9915-2004-3-364>
- Saharan, T., & Jafri, S. (2012). Valuation of HRIS Status an Insight of Indian Companies' Perspectives. In S. C. Kundu, B. K. Punia, K. P. Narwal, & D. Singh (Eds.), *Business Management: Key Research Issues* (pp. 113-127). Excel Books.
- Schouten, A., Oostrom, K., Pestman, W., Peters, A., & Jennekens-Schinkel, A. (2002). Learning and Memory of School Children with Epilepsy: A Prospective Controlled Longitudinal Study. *Developmental Medicine and Child Neurology*, 44, 803-811. <https://doi.org/10.1111/j.1469-8749.2002.tb00770.x>
- Tannenbaum, S. I. (1990). Human Resource Information Systems: User Group Implications. *Journal of Systems Management*, 41, 27.
- Tansley, C., & Newell, S. (2007). A Knowledge-Based View of Agenda-Formation in the Development of Human Resource Information Systems. *Management Learning*, 38, 95-119. <https://doi.org/10.1177/1350507607073028>
- Teo, T. S. H., Lim, G. S., & Fedric, S. A. (2007). The Adoption and Diffusion of Human Resources Information Systems in Singapore. *Asia Pacific Journal of Human Resources*, 45, 44-62. <https://doi.org/10.1177/1038411107075402>
- Teo, T. S., Soon, L. G., & Fedric, S. A. (2001). Adoption and Impact of Human Resource Information Systems (HRIS). *Research and Practice in Human Resource Management*, 9, 101-117.
- Troshani, I., Jerram, C., & Hill, S. R. (2011). Exploring the Public Sector Adoption of HRIS. *Industrial Management & Data Systems*, 111, 470-488. <https://doi.org/10.1108/02635571111118314>
- Weeks, K. O. (2013). An Analysis of Human Resource Information Systems Impact on Employees. *Journal of Management Policy and Practice*, 14, 35.
- Winkler, S., König, C. J., & Kleinmann, M. (2013). What Makes Human Resource Infor-

mation Successful? Managers' Perceptions of Attributes for Successful Human Resource Information. *The International Journal of Human Resource Management*, 24, 227-242. <https://doi.org/10.1080/09585192.2012.680068>

Zafar, H. (2013). Human Resource Information Systems: Information Security Concerns for Organizations. *Human Resource Management Review*, 23, 105-113. <https://doi.org/10.1016/j.hrmr.2012.06.010>

Zainol, Z., Fernandez, D., & Ahmad, H. (2017). Public Sector Accountants' Opinion on Impact of a New Enterprise System. *Procedia Computer Science*, 124, 247-254. <https://doi.org/10.1016/j.procs.2017.12.153>