

Developing the Initial Framework of HRIS

¹Hilkka Poutanen and ²Vesa Puhakka

¹Department of Information Processing Science, University of Oulu
PL 3000, 90014 Oulun yliopisto, Finland

²Department of Management and Entrepreneurship, University of Oulu
90014 Oulun yliopisto, Finland

Abstract. The history of human resource information systems (HRIS) stretch back to the 1960s when human resource (HR) activities started to increase in organizations. In the 1980s researchers and practitioners became interested in HRIS and in the 1990s several studies, articles, user experiences, opinions and descriptions were published in journals, magazines and internet. Many different issues have arisen in these discussions. Some researchers have constructed models and definitions for HRIS. However, there is a lack of a framework which constructs a description out of the fragmented discipline of HRIS. In this workshop paper we introduce our initial framework to underline the importance and need to consolidate the knowledge of HRIS. It bases on the literature and internet site reviews. The framework does not intend to cover the HRIS field as whole but to signal that it is time to construct frameworks to support and lead the research and the theory making in HRIS. Many research questions are stated in the referenced articles. Now it is time to start finding the answers.

1 Introduction

In the literature different definitions of the human resource information systems (HRIS) are available. Broderick and Boudreau [7] define HRIS as follows: it is “the composite of databases, computer applications, and hardware and software that are used to collect/record, store, manage, deliver, present, and manipulate data for Human Resources”. Kossek et al [18] use this definition as well. Kavanagh, Gueutal and Tannenbaum [17] offer another definition: “A human resource information system is a system used to acquire, store, manipulate, analyze, retrieve, and distribute pertinent information about an organization’s human resources”. The third definition, from Walker [36], also used by Kovach and Cathcart Jr. [19], states that “a Human Resource Information System is a systematic procedure for collecting, storing, maintaining, retrieving, and validating data needed by an organization about its human resources, personnel activities, and organization unit characteristics”

The similarity of different HRIS definition could be interpreted as evidence that the researchers have worked by themselves, not knowing anything or very little about each others’ work. To some extent, the examination of HRIS articles and papers confirms this interpretation. Although researchers have later referenced each others articles, there is no collaboration between the researchers. The issues related in HRIS are fragmented, and the discipline is waiting to be consolidated.

Therefore, it is significant that efforts should focus on the different studies and research of HRIS, as there are multiple issues and viewpoints which should be evaluated before the HRIS acquisition and during the HRIS implementation and use. Many discussions are in their beginnings or are still waiting to be opened in this discipline. We argue that owing to the lack of the initial general view and framework on HRIS research, activities are more focused on the researcher's own interest area than on the contributions which support the whole HRIS discipline. In our paper we present one initial framework which contains some of the many relevant issues which should be studied properly. The framework does not aim to cover the HRIS field as whole but to signal that it is time to construct frameworks to support and lead the research and theory making.

2 The Basics of the Initial Framework

Our initial framework of HRIS bases itself on the literature review. We also study internet sites of HRIS business and practices which have given us an empirical background to explore our knowledge. When we examine the literature and articles, we perceive that the issues these articles were mainly discussing can be divided into four basic categories. The basic categories of our initial framework are presented in Figure 1.

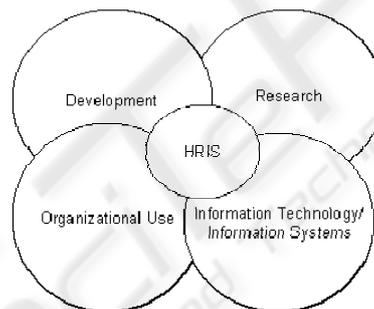


Fig. 1. The Initial Framework of HRIS with the basic categories; IT/IS, Organizational Use, Development and Research.

The articles which discuss particularly technological and software design issues are gathered into the Information Technology/Information Systems (IT/IS) category. The Organizational Use contains articles which focus mainly on application areas, users, and discussion of the usage and utility of HRIS. The third category includes the articles which discuss the historical, current and future development of HRIS. The articles which propose the theoretical concepts and models of HRIS are situated in the Research category. The categories overlap with each other, which reveals that the issues could be discussed in one or several categories. However, the reason for dividing them underlines the different viewpoints on the HRIS issues. In the following chapters some issues of the categories are described.

3 Investing in Information Technology and Information Systems

Employee data were first automated in the 1960s. Since the 1980s there has been considerable discussion about HRIS and its role in the organization. Many predictions have been made as to how soon organizations will implement HRIS. However, the acquisition of HRIS has often been under critical consideration. Human resources and HRIS are costs for the organization. Earlier massive information systems and computers were expensive. Later when personal computers and technology were developed the price of the computers and systems decreased but the employee costs increased. The consideration remains. [9,12,17].

When the organization invests in technology and software the main goals are to gain benefits and to reduce costs. Technology allows it possible to cheaper, easier, and faster data processing than before. Also, it enhances the accession to more detailed information and data. [13]. In the introduction we presented three definitions of HRIS. Definitions of HRM include the activities associated with employees. These activities typically consist of recruiting, training, promoting, terminating, record-keeping and meeting various legal requirements. When we compare the definitions of HRM and HRIS together it is apparent that HRIS is the automation of HRM tasks and functions. The manual systems have been converted to databases and electronic systems.

In other words, the information technology provides the technical and computer based solution for HRM. The software solutions support the HR tasks and functions which have emerged from the development of human resource management (HRM). The HRIS definitions list those tasks and functions. So, IT provides the developed electronic base to software, and IS challenges technical solutions through applications. IT/IS serve people and the tasks they perform.

One relevant research issue is the cost-benefit analysis of HRIS. What would it mean in short and long term organizational planning? Are the investments HR costs or benefit for good HR work.

3.1 Information Technology Means Changes

Benefits and costs are at the top of the list when we talk about the reasons for investing in technology. What other reasons there could be? What background factors lie behind these reasons? Only a few of these background factors are introduced next. When there are a lot of employees' data to be stored which data is important for decision-making? The technology itself is easier to use than a few decades ago but what knowledge can the users draw from it? Information networks provide more possibilities to connect different units in the global organization. Can user rights provide security and limitations to access the data?

If there is an HR staff in the organization, then they usually collect and take care of the data in the system. [4,9] If managers are responsible for HR functions, they use the HRIS. Whatever the case, it is obvious that automation and technology bring changes to the functions and tasks. One relevant question is do the users have competencies to use the technology? What should be done before implementation? What should the organization do with the system? What does legislation say about data privacy?

Although the changes are unavoidable, they do not imply a negative situation. Technology provides ways to examine the daily HR functions in an organization and make any necessary renewals. Thus, the research could focus on the changes that HRIS has made in HR routines and activities.

3.2 Designing Information Systems

When information systems are designed, implemented and used, the basic and simple issue is to remember for what purposes IS are available. There is a variety of IS on the market which are advertised as the best solution to run organization's HR functions. Therefore, the managers and HR staff should have the competence and knowledge to evaluate the IS before making decisions to purchase HRIS.

This leads to the question of who is capable and experienced enough to evaluate and design HRIS? Managers, HR professionals or IS professionals? We can examine the question through the user satisfaction and the system usage as Haines and Petit [12] did. The need for information is great. However, technology, computerization and HRIS can lead the management being handled by HR professionals. The managers do not use HRIS if they are unfamiliar with the system and they would therefore not obtain the data needed. Furthermore, managers with longer work experience may be less satisfied with the HRIS than younger managers who are more familiar with the technology and systems. User satisfaction and system usage have become two common measures of system success in HR function as well. [12] We may conclude that to design HRIS it is important to underline that all knowledge is available during the development process.

In his article, Niederman [24] presents the socio-technical approach to information systems. According to Niederman, it "requires recognition of the inextricable link between information technologies and humans as designers and users" [24]. He has studied global organizations, and constructed five interaction areas for information technology and human computer designers/users. The areas are as follows: 1) using information technology to support the human resource strategy of global organizations, 2) using information technology to support the generation and distribution of organizational learning, 3) using human resource management techniques and programs to support the work of information systems professionals, 4) using human resource management techniques and programs to support the work of global "end-user" or knowledge workers, and 5) national and regional policies to support technical and human resource infrastructures. He proposes several research questions for each of these areas to study the importance of the issues. [24].

4 The Organizational Use of HRIS

The Organizational Use category has many issues. The organization could invest in top technique and intelligent systems but the question is how they can be integrated into the daily tasks and organizational activities. Also, the company size indicates how HRIS is used, and who uses it. Ball [4] has studied the use of HRIS according to the number of employees. At the end of the paper she summarizes the survey results. In brief, HRIS is used more in large organizations than in small ones. Furthermore, HRIS is still being used administratively although the information and data support

more other HR activities. Ball says that her research provides a platform of future work in this area, as well as offers several issues to be studied. [4].

Six years later Hussain et al [14] provided results from similar research. According to their research HR professionals are more familiar than before with HRIS. HR professionals use it for strategic partnering, and the company size is not as relevant as in Ball's research. In fact, although the small companies consider that the investments in HRIS are high they exploit the system better. [14]

The use and usability of HRIS needs more rigorous research.

4.1 Users of HRIS

When we invoke the organization we also invoke human resources (managers and employees) with different roles and tasks. Management occurs between managers and employees. If the organization has HRIS, the whole staff employs it but for different reasons and probably with different techniques. "The whole staff" includes HR people. The history of HR departments comes from personnel departments whose duty was to handle of the employee issues in the organizations. The work in HRM departments has broadened, become more relevant and accrued responsibility during the development in organization. However, HR experts have felt that they have been locked out of strategic and financial discussions. The existence of HRIS has given more importance and credibility to HR department and staff.

Primarily, HRIS is seen as a tool for HR staff. [28] However, many studies have been conducted in the 1980s and 1990s when HR systems evolved strongly, and HR people were the first to use them in the organization. For example, DeSanctis [9] and Haines and Petit [12] studied the use and usability of HRIS. In her research, DeSanctis notes that at that time, in 1986, the HRIS users were mainly HR staff. [9] The population in Haines' and Petit's research was drawn from HR professionals. The study itself focuses on the system usage and the user satisfaction. [12] Kavanagh et al [17] stress that there are a variety of potential users of HRIS in the organization. Thus, we can not make the conclusion that HRIS is only for HR staff but for the whole organization.

Here, the research questions are 1) who are using and 2) who should be using HRIS in the organization.

4.2 Utility Discussions

A real time HRIS and skilful HR staff could prove a competitive advantage for the organization. Amit and Belcourt [1] introduce in their article the meaning of the tacit human resource management which the organization obtains over a long period of practice. Usually, HRM routines and activities are described as one model or pattern. However, it is important to acknowledge that organizations have their own practices and mechanisms to attract, motivate, evaluate and compensate their human resources. The paper explains "how adapting a 'process' perspective of HRM leads to the conclusion that an organization's ability to build, deploy and renew its productive human-capital through transformational routines in ways that cannot be easily replicated by other organizations generates a competitive advantage in the market" [1].

The advantages, effectiveness, and competitiveness of the system are introduced when the authors wish to argue for and confirm the use of HRIS. Rapid data access, information exchange, administrative and strategic advantage are the basic topics which are discussed. [19,20] All these issues need further study.

5 The Development of HRIS Research

The history of HRIS is short in terms of both practice and research. HR information systems have developed from the payroll systems and have now their own branch among other managerial IS in organizations. In the 1960s and 1970s only big companies could afford to invest in hardware and software for HRIS. Computers were bulky and the software was difficult to use. At that time, the main task of HRIS was the record-keeping. Over the years, technology developed and cheaper equipment as well as and more versatile software for HR activities became available. [2,17,36]

Even HR staff members were at first skeptical. This skepticism and hesitancy stemmed from the HR staff's lack of computer and software education. Jones and Hoell [16] present in their article the courses available today for HR students. It is a part of the HR profession to learn and develop technical skills.

The previous chapters present some of the many issues related to HRIS in practice. HRIS research has achieved stronger base during the new millennium. The empirical studies have more breadth because organizations have gained experience in using HRIS. In the 1980s studies attempted to establish the nature of HRIS. In the 1990s studies were full of different expectations of how HRIS affects an organization's HR activities and business planning. There were studies about who was using HRIS and for what purpose, and the advantages of using HRIS. The organization was efficient if it had the technology and IS to supported the HR activities. Also, the effect of HRIS for the work and development of HR department and professionals were under discussion. [2,3,6,7,10,11,12,13,18,24,26,29,31,34,35]

Kavanagh et al [17] and Walker [36] have written HRIS handbooks. Kavanagh et al [17] focus more on the IS site of HRIS. The book analyses the system itself and what should have been noticed before the implementation. Also, it introduces HRIS applications. Walker's [36] book gives a more technical and process oriented viewpoint to the development and implementation of HRIS. The message plays on the effectiveness what the system can offer strategic HRM and the whole organization in the future. Both publications are referenced, although the handbooks do not have a distinct academic background. Thus far, they are the only books available for HRIS.

Predictions are always difficult. Still, it is important to analyze the development of research and practice. Opinions and viewpoints offer paths for new ideas and innovations. Organizations make short and long term plans and strategies to stay in business. Atwater [2] wrote in his research review that HRIS is a tool to give HR information to the business planning process. He designated the process as "the workforce forecasting" and defined it as follows: "it focuses on predictions about the size and mix of a pool of workers in the future" [2]. This process challenges the HRIS to provide valuable information on employees when an organization needs it for filling job post, or keeping information from available employees.

Today, many HRIS have the information which is important for management. The new challenge however, is the leadership. Employers need more human information on employees and their actions in different situations, which, in our research

interviews, leaders have claimed as being very significant. However, legislation and (at least) moral issues limit access to such information.

The research focuses on theories and making models and patterns. HRIS research is fragmented in different research papers and results. Already, several models and conceptions are available. [22] The time has come to collect them, discover the whole available HRIS picture, and introduce the research areas. There are many research questions in the referenced articles. Now is the time to find answers.

6 Our Initial Framework for HRIS

In chapter 2 and figure 1 we introduced the basic categories of our initial framework for HRIS. In chapters 3 to 5 we highlighted some research issues from each category. We pointed out that there are several areas to be studied. Our intention has not been to cover all of them but to construct a description which expresses the diversity in the HRIS discipline. The description became our initial framework of HRIS.

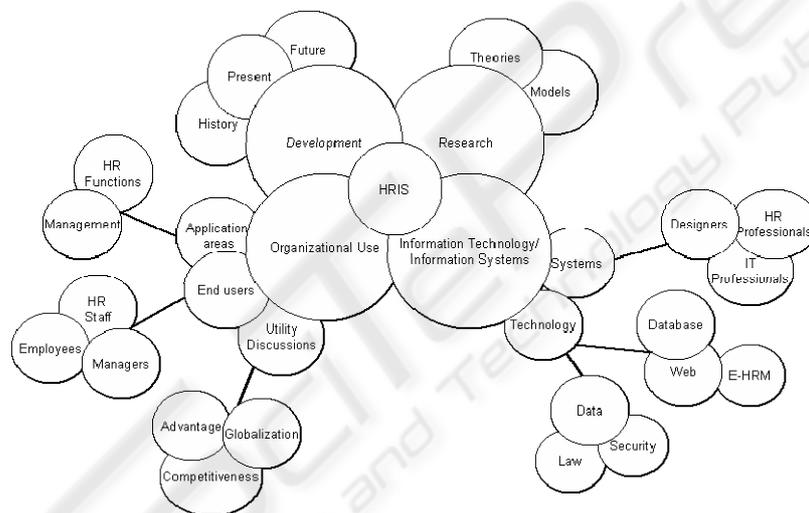


Fig. 2. The Initial Framework of HRIS.

In figure 2, we present the initial framework as a whole. The IT/IS category includes the issues of the system designing. The specific target groups are the people who are, or could be, involved in the design and implementation process as well as in the use and usability testing. Technology has changed HR activities. From different files we have moved to the databases and web systems. The data security and legislation give strict orders on how the data should be processed and who has the authority to use the information. Accessing the individual data is always a sensitive matter.

The Organizational Use includes application areas, end users and different utility discussions which underline the importance of HRIS in an organization. Competitiveness, advantages and globalization are commonly discussed. The application areas describe the functions and activities which are supported by HRIS. The basic areas of discussion are HRM and management. Managers, HR staff and

employees represent the end users involved in the HRIS. Here, the issue is the meaning of the information which the system produces.

In the Development category the discussion topics are the history, the present and the future of HRIS development. The history of the development is quite clear but the present development is difficult to clarify because of the fast growth of technology which has impacted on software development. The theory-making and the model construction are included in the Research category. Modelling is a useful means to clarify the HRIS processes as well as the activities HRIS serves. This has already been done by a number of researchers. However, the theories are still waiting for to be developed and published. We believe that the future will bring interesting discussions and debates.

7 Conclusion

In our article we have introduced the initial framework to raise discussion about HRIS and issues related to the discipline. Our contribution consist of the four conceptions/categories – IT/IS, Organizational Use, Development and Research – aggregate HRIS research which for the moment is fragmented. We want to encourage researchers to continue their work and to gather their knowledge together. The topics and issues of the conceptions summarized in chapter 6 could be the impetus for future studies. The history of HRIS is well-known, but now it is significant to study practice and construct theories and models to introduce the discipline and evoke diverse discussions.

Renewal capacity to search for new businesses is crucial nowadays. The business environment is accelerating all the time and thus the supporting role of HRIS to handle demanding and complicate organizational work is becoming more important than ever. Therefore, future research on HRIS should take into account the nature of managerial work in our post-modern digital time. The research in HRIS is young. The sphere is not developed although it is one of the most important lines of human resource management. Therefore, to develop knowledge it is needed international collaboration and research programs to study many sides of this complicated phenomenon.

References

1. Amit, R, and Belcourt, M.: Human Resources Management Processes: A Value-Creating Source of Competitive Advantage, *European Management Journal*, Vol. 17, No. 2 (1999) 174-181
2. Atwater, D.M.: Workforce Forecasting, *HR. Human Resource Planning*, Vol. 18, No. 4 (1995) 50-53
3. Axel, H.: Human resources and the role of IT, *Human Resource Management International Digest*, Vol. 6, No. 6 (1998) 30-32
4. Ball, K.S.: The use of human resource information systems: a survey, *Personnel Review*, Vol. 30, NO. 5/66 (2001) 677-693
5. Basu, V., Hartono, E., Lederer, A.L. and Sethi, V.: The impact of organizational commitment, senior management involvement, and team involvement on strategic information systems planning, *Information & Management*, Vol. 39, Iss. 6 (2002) 513-524

6. Broderick, R.F., Boudreau, J.W.: Human Resource Information Systems for Competitive Advantage: Interviews with Ten Leaders, CAHRS Working Paper Series, Cornell University (1991)
7. Broderick, R.F., Boudreau, J.W.: Human resource management, information technology, and the competitive edge, *The Executive*, Vol. 6, No. 2 (1992) 7-17
8. Cascio, W.F. and Awad, E.M.: *Human Resource Management: An Information Systems Approach*, Reston Publishing Company, Inc., Reston, Virginia, USA (1981)
9. DeSanctis, G.: Human Resource Information Systems: A Current Assessment, *MIS Quarterly*, Vol 10, Iss.1 (1986) 15-27.
10. Elliot, R.H., Tevavichulada S.: Computer Literacy and Human Resource management: A Public/Private Sector comparison, *Public Personnel Management*, Vol. 28, No. 2 (1999) 259-274
11. Groe, G.M., Pyle, W., Jamrog, J.J.: Information Technology and HR, *HR. Human Resource Planning*, Vol. 19, No. 1 (1996) 56-61
12. Haines, V.Y. and Petit, A.: Conditions for Successful Human Resource Information Systems, *Human Resource Management*, Vol. 36, No. 2 (1997) 261-275
13. Hubbard, J.C., Forcht, K., Thomas, D.S.: Human resource Information Systems: An Overview of Current Ethical and Legal Issues, *Journal of Business Ethics*, Vol. 17, No. 12 (1998) 1319-1323
14. Hussain, Z., Wallace, J., Cornelius, N.E.: The use and impact of human resource information systems on human resource management professionals, *Information & Management*, Vol 44, Iss. 1 (2007) 74-89
15. Hustad, E., Munkvold, B.E.: IT-supported competence management: A case study at Ericsson, *Information Systems Management*, Vol. 22, No. 2 (2005) 78-88
16. Jones, W.J., Hoell, R.C.: Human Resource Information System Courses: An Examination of Instructional Methods, *Journal of Information Systems Education*, Vol 16, No.3 (2005) 321-328
17. Kavanagh, M.J., Gueutal, H.G. and Tannenbaum, S.I.: *Human Resource Information Systems: Development and Applications*, PWS-KENT Publishing Company, Boston (1990)
18. Kossek, E.E., Young, W., Gash, D.C., and Nichol, V.: Waiting for Innovation in the Human Resources Department: Godot Implements a Human Resources Information System, *Human Resource Management*, Vol. 33, No. 1. (1994) 135-159
19. Kovach, K.A. and Cathcart, Jr., C.E.: Human Resource Information Systems (HRIS): Providing Business with Rapid Data Access, Information Exchange and Strategic Advantage, *Public Personnel Management*, Vol. 28, No. 2 (1999) 275-282
20. Kovach, K.A., Hughes, A.A., Fagon, P., and Maggitti P.G.: Administrative and Strategic Advantages of HRIS, *Employment relations Today*, Vol. 29, No. 2 (2002) 43-48
21. Lippert, S.K. and Swiercz, P.M.: Human resource information systems (HRIS) and technology trust, *Journal of Information Science*, Vol.31, No.5 (2005) 340-353
22. Mayfield, M., Mayfield, J., and Lunce, S.: Human Resource Information Systems: a Review and Model Development, *Advances in Competitiveness Research*, Vol 11, No. 1 (2003) 139-151
23. Ngai, E.W.T. and Wat, F.K.T.: Human resource information systems: a review and empirical analysis, *Personnel review*, Vol.35, No.3 (2006) 297-314
24. Niederman, F.: Global Information Systems and Human Resource Management: A Research Agenda, *Journal of Global Information Management*, Vol. 7, No. 2 (1999) 33-39
25. Reiss, M.: Mass Personalization, An Internet-enabled Strategy for e-HRM, Available: <http://www.bwi.uni-stuttgart.de/fileadmin/abt2/publikationen/mass-personalization.pdf> (2003)
26. Rodger, J.A., Pendharkar, P.C., Paper, D.J., Molnar, P.: Reengineering the human resource information system at Gamma, *Facilities*, Vol. 16, Iss. 12/13 (1998) 361-365
27. Ruël, H.J.M., Bondarouk, T.: The Web-driven individualization of the employment relationship, http://exchange.usg.uu.nl/irec/papers/5_RuelBondarouk.doc (2004)

28. Ruël, H., Bondarouk, T., Looise, J.K.: E-HRM: Innovation or Irritation, An Explorative Empirical Study in Five Large Companies on Web-based HRM, *Management Revue*, Vol. 15, No. 3 (2004) 364-380
29. Stroh, L.K., Grasshoff, S., Rudé, A. and Carter, N.: Intergrated HR Systems Help Develop Global Leaders, *HRMagazine*, Vol. 43, No. 5 (1998) 13-17
30. Strohmeier, S. (2005) Research in e-HRM?, Available: http://www.mis.uni-saarland.de/internet/lehre/SeminareHRM/researchin_ehrm_working_paper.pdf [30 Nov 2005]
31. Tannenbaum, S.I.: Human Resource Information Systems: User Group Implications, *Journal of Systems Management*, Vol. 41, No. 1 (1990) 27-26
32. Tansley, C., Newell, S., Williams, H.: Effecting HRM-style practices through an integrated human resource information system, An e.greenfield site?, *Personnel Review*, Vol. 30, No. 3 (2001) 351-370
33. Targowski, A.S. and Deshpande, S.P.: The Utility and Selection of an HRIS, *Advances in Competitiveness Research*, Vol. 9, No. 1 (2001) 42-56
34. Townsend, A.M., Hendrickson, A.R.: Recasting HRIS as an Information Resource, *HRMagazine*, Vol. 41, Iss. 2 (1996) 91-94
35. Van der Linden, G., Parker, P.: On paradoxes between human resources management, postmodernism, and HR information systems, *Accounting, Management and Information Technology*, Vol. 8, Iss. 4 (1998) 265-282
36. Walker, A.J.: *Handbook of Human Resource Information Systems: Reshaping the Human Resource Function with Technology*, McGraw-Hill, Inc., USA (1993)
37. Weatherly, L.A.: HR Technology: Leveraging the Shift to Self-Service – It's Time to Go Strategic, *HRMagazine*, Vol. 50, Iss. 3 (2005) 1-11

