Studying Human Resource Information Systems from an Integrated Perspective: A Research Agenda

Rodrigo Magalhães and Huub Ruël

Kuwait-Maastricht Business School, Dasma, Kuwait

Abstract. This paper aims at setting an agenda for HRIS research from an integrative perspective. This perspective assumes that organization and information systems cannot be separated. By first elaborating on this integrated perspective in terms of a web of causes and consequences of the implementation of ICT in organizations, a list of new organizational phenomena is presented. Subsequently, research on HRISs up to date is summarized, resulting in the observation that HRIS research needs to be broadened and deepened. In section three, we combine the list of emerging phenomena with how HRISs are being implemented and used in mainly large global companies. We raise a number of critical questions for HRIS research per each emerging phenomena and suggest a number of appropriate research topics.

1 Introduction

Human Resource Information Systems are a subject of study for two about two decades. The first studies on Human Resource Information Systems date back to the mid-1980's [1]. However since the end of the 1990's this subject has grown in importance as the widespread application of web technology has given a boost to further development of web-based HRISs. With the use of web technology, HRISs have crossed the borders of the HR department and have began to target the wider organization: senior management, line managers and last but for sure not least employees. With this development studying HRIS has become more complex, with HRISs evolving into information systems entangled with all aspects of organization. In other words, HRISs are not a technology, but are the result of the integration of ICT and organization. This perspective provokes a whole new array of research topics for the field of HRISs.

In this paper we try to set out a research agenda for studying HRISs. Once again, the basic assumption is that HRISs are an integration of information and communication technologies (ICT) and organization. More specifically the integration of HRISs within organization can be considered as an intricate web of causes and many consequences. HRIS cannot be studied separate from its organizational context they are interwoven.

So far, the study of HRIS has resulted in a limited number of perspectives and issues that have been studied. With the first international e-HRM workshop being held in Oct 2006 the research area got a certain fundament. However, it should be considered as just a first step. The goal of this paper is to provoke researchers and practitioners in IT and

HR. For researchers this paper aims at giving input for research topics and perspectives, for practitioners this paper aims at outlining the complexitiy of HRISs and the consequences for HRIS implementation and further development.

The structure of the paper is as follows: first we elaborate on the integration of ICT and organization. A list of phenomena will be presented that have emerged from the point where information systems started to be employed on a large scale in organizations. The novelty about the phenomena chosen is that they view ICT and organization as integrated and inseparable. ICT and organization are like a web of causes and consequences. After that we present how these phenomena could trigger HRIS research and what type of research questions and issue could emerge from these phenomena.

2 The Integration of ICT and Organization: A Web of Causes and Consequences

Information and Communication Technologies (ICT) are becoming ever more infused, absorbed, integrated, appropriated and diffused into or by organizations, creating a host of contradictory impacts. ICT are responsible for delayering and relayering of organizational structures, for deskilling and upskilling of personnel, for more autocratic and more participative management styles, for breaking down and for erecting organizational boundaries [2]. In a nutshell, the information age or the knowledge era with all its confusing promises, expectations, myths and consequences are here to stay and present a new wave of challenge to people, society, organizations and universities.

At the same time, more than ever before we live in a world of organizations. From the growth of the internet to the mounting complexity of world politics; from the increasing use of air travel to the renewed struggle against world poverty; from the busy construction of a United Europe to the world race on the vaccine for AIDS and other plagues, all we see around us are organizations emerging, forming, changing and dying at an impressive speed. In an increasingly complex world, the endeavour for the survival of the human species has be organized and managed. And organizing and managing today is totally enmeshed with ICT applications

We propose that the integration of Organization and ICT can be seen as an intricate web of many causes and many consequences where there are no exclusive one-to-relationships (see Figure 1). The web is made up of a number of interrelated factors or phenomena which sometimes act as the cause and other times act as the consequence of the integration of ICT artifacts into organizations. For example, *compression of competitive time* is related to *hypercompetition*, but so is *competitive market pressure*, *convergence of info-com* or the *breaking up of conventional business boundaries*. For reasons of space the explanation of Figure 1 will be very brief. For a more detailed discussion the reader is referred to [2].
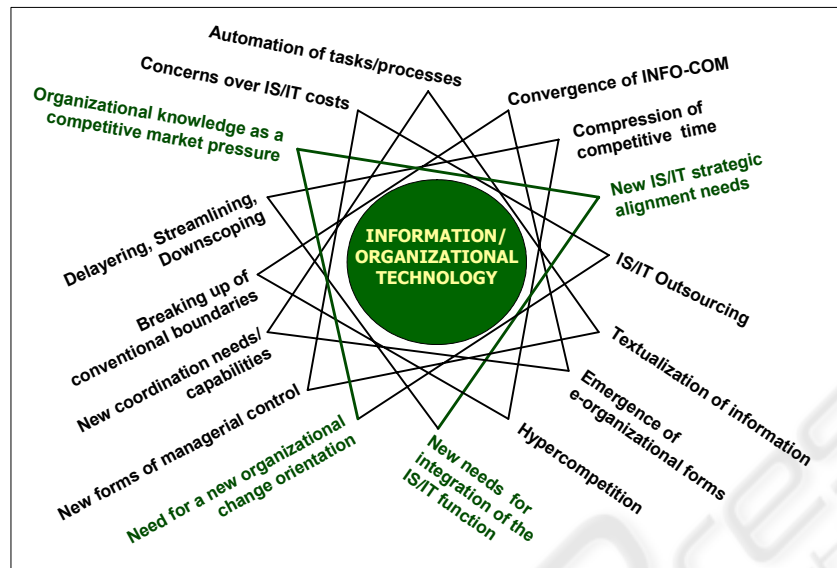
Fig. 1. The Web of Causes and Consequences of Organization and Information Systems.

We start unweaving the web with ***the automation of tasks and processes***, one of the earliest steps taken on the road towards the knowledge society. It was not until the eighties that the impact of the application of ICT on the workplace started to be reported both as a general management priority [3;4] and an academic management concern [5]. The topics covered ranged from ergonomics and usability, job design, deskilling and upskilling, employment and careers to industrial relations implications, organizational design and the role of users.

Related to the spreading of ICT application to *automate tasks and processes*, there is the interesting phenomena of the increasing ***textualization of information*** in the workplace. Such phenomenon, tied to the representational qualities of ICT, was the object of a major study by [6] published in the book *In the Age of the Smart Machine*. What is interesting and challenging about Zuboff's work is not the new technology per se but the innovative and even contradictory ends to which it can be put by different managers in different contexts. In some contexts, the technology may have an "automate" effect, i.e. it turns manual tasks which were previously interesting into dull, repetitive and unmotivating tasks; but in other contexts, the technology has an "informate" effect, meaning that the manual tasks become more challenging and interesting, due to the richer information environment provided by the technology.

Also related to the *automation of tasks and processes*, there is the issue of ***concerns over IT costs*** which have not stopped escalating (as a percentage of total costs) since the early days of computing. It has suggested that the growth of computing goes through periods of *slack* and *control* [7] or *expansion* and *control* [8] and that these are due to market forces outside the organization and managerial forces inside the organization. The balance between these two types of forces continues to be one of the characteristics of ICT organizational integration.

The increasing *textualization of information* in organizations has had another very important consequence, i.e. the rise of **new forms of managerial control**. With the rapid advances in database management and in data storage technologies, information about everything happening in the organization has been stored in powerful datawharehousing systems and made available through executive information systems (EIS). One important type of EIS are those designed to support the Balanced Scorecards Methodology [9]. The BSC Methodology has been another very important development in the integration of ICT into the organization's strategy. These new tools come about in response to the dramatic effect of **compression of competitive time** which, in turn, is a recurrent consequence of the development of ICTs and especially of the internet. What is meant is that the life expectancy of competitive strategies based on customer and business process indicators has become so short that future-oriented indicators (i.e. development and innovation) are rapidly becoming the most important, in terms of management control.

The internet is at the core of a new economic space, in the continuous movement towards a world economy based less and less on physical assets and increasingly dependent on knowledge and information. In what concerns the impact of the Net in business, [10] suggests that half of all the businesses conducted in the industrial world will be affected by this huge information market, generically known as e-commerce or e-business. Product evolution is extremely rapid in the internet market space. This is in line with what [11] has termed **hypercompetition**. From the point of view of *hypercompetition*, the question of applying ICT to business processes in order to achieve greater speed (and better timing) is crucial. However, this question cannot be solved purely by the acquisition or application of ICT artifacts. These take time, in terms of both individual and organizational learning [12] Conceivably, ICT take even longer than other organizational resources for appropriate skills and competencies to be developed.

The issue of ICT skills and competencies is also related to the still "hot" topic of **outsourcing**. For a number reasons, a growing number of companies has opted for outsourcing, that is, the contracting out of not just the development but also the implementation, the maintenance and even the management of their information systems and technologies. According to [10] p. 210) "outsourcing IT would be almost like outsourcing all the firm's employees". However, ICT outsourcing is a reality and the answers to the problems seem be to be found in a selective mix of outsourcing and insourcing as well as in the turning of the outsourcing agreements into carefully planned and managed strategic partnerships [13].

The issue of *hypercompetition*, like all the others in our web, is both a cause and a consequence. As such, it is linked to several other factors but one of them deserves a special mention: the **convergence of info-com** [14]**.** The growing convergence between information and communication (info-com) technologies has changed the business environment dramatically, as correctly predicted by [15]. Thus, the *breaking up of conventional boundaries*, *delayering, streamlining and downscoping*, *new coordination needs and capabilities* and the *emergence of new organizational forms* are all consequences of the *convergence of info-com*. The following are just some of the topics addressed in the literature: changes in internal and external business frontiers [16; 17; 18], the role of networking in sustaining competitive advantage [19], changes in organizational structures and managerial processes [20], the growing interdependence of organizational functions [21], computers as coordination

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technology [22], reengineering and process redesign [23; 24; 25], managing by wire [26], changes in individual, group and managerial work practices [27] and the emergence of new organizational forms [28].

Enabled by ICT, human networking and organizational communication have become key ingredients in the overall improvement of the effectiveness of organizational processes which, in turn, provides a major contribution to the creation and accumulation of knowledge in the organization. No organization can afford to be left behind, and *organizational knowledge* becomes a *competitive pressure* driven by the market [29; 30; 31]. Under the umbrella of strategy and competitive advantage, one of the issues more widely discussed has been *IT strategic alignment* [32]. The implementation of IT strategies brings about the development of the ICT infrastructure and the ultimate aim of *IT strategic alignment* is to maintain the ICT infrastructure permanently in tune with the organization's strategy. However, placing the ICT infrastructure in the organization's strategic agenda is not a simple task and in the last decade and a half there is no evidence that any form of alignment has been achieved [33]. Hence, the challenge is to find *new forms of IT alignment*.

IT strategic alignment is not something that just happens in a given point in time, but is something which is built up or *constituted* with the passing of time. Authors such as [34; 35] or [36] have pointed out the need for the information systems field to adopt an *organizational change orientation*. Talking about organizational change inevitably leads us to a discussion about organizational behaviour. The fact that organizational behaviour is not normally considered as part of the information systems problematic has lead [37] to suggest that "the current wisdom of information systems is based upon a rather poverty-stricken view of what an organization is" (Ibid, p. 60).

Organizational change competencies is also what is needed for organizations to overcome the challenge of *integrating the Information Systems function* with all the other functions, the last factor in our web of causes and consequences. The traditional information systems functions (Computer Operations, Systems Development, Architecture Development and Business Information Requirements Identification) are undergoing majors changes [38]. Such changes are creating a need for new types of relationships in the organization, in other words, a new context comprising the new technologies and the accompanying new *modus operandi*.

The information systems function is no longer restricted to the role of the information systems or the IT Director and his/her department. Many of the traditional roles of such departments are being transferred to or shared with top management, line departments and end-users [39; 40; 21; 41; 42; 43; 44]. On the other hand, a number authors has identified the *culture gap* or the *disconnect* between information systems and business management departments [45; 46; 47; 48; 49].

The integration of IS and organization as shown by the above list of causes and consequences could apply for HRISs as well. HRISs evidence the integration in its purest form. This makes the study of HRIS a complex matter, but also a challenging one. Before we start to describe how in our view the causes and consequences list applies for HRISs, we will first become more precise on the definition of HRISs and research on HRISs up to date.

3 Human Resource Information Systems: An Evolving Phenomenon

In earlier studies HRISs have been excluded from the e-HRM area since some authors were of the opinion that there was a fundamental difference between HRIS and e-HR in that. Basically, HRISs were directed towards the HR department itself. Users of these systems were mainly HR staff as these types of systems aimed to improve the processes within the HR department itself [50]..

In this paper however, we consider the term HRIS as encapsulating the whole area of IT, internet technology and HRM. The commonly used terms nowadays like e-HRM, web-based HRM, and IT based HRM are considered as developments within the area of HRISS. Although we agree that HRISS in the early days concerned mainly IT-based information systems for the HR department, we do not agree that a line can be drawn between IT-based information systems for HR and internet-based HR applications, they are basically similar: IT technologies for HR activities, whether performed within the HR department or outside the HR department, for example by line managers and employees. Therefore, in this paper we define HRIS as *all IT-based information systems and applications, either stand-alone or networked, for human resource management purposes, be it for facilitating HR practices, policies or strategies.*

HRISS in their current appearance emerged from a number of developments in society and business. Following [51] the first building block for HRISS was the worldwide distribution of PC's that facilitated managers and employees with the hardware to perform HR tasks electronically. However, with the availability of PCs computer literacy had to increase in order to enable managers and employees to use the technology. The Internet opened the way to connect PC's and to communicate in real-time. In this way many physical hurdles that before formed obstacles for efficient interaction and smooth business processes were bypassed. On top of that enterprise resource planning (ERP) systems created the opportunity to link all business processes. Databases that before were isolated could be integrated and "into a seamless whole for real-time transaction processing and decision making" [51, p. 367]. The final stage arrived when HR professionals and information technology specialists joined forces and developed electronic information systems "that moved HR information and decision making from file drawers to computers" [51, p. 367]. HR processes were reengineered to eliminate steps and to speed up cycle times.

Broadly speaking, HRISs appear in three types: operational HRISs, relational HRISs, and transformational HRISs. This division is based upon [50]. The first type, operational HRISs, concern systems that are used for basic HR activities in the administrative area, such as payroll and personnel data administration (employee's personal data, job description, CV, holiday leave etc.). The second type, relational HRISs concerns more advanced HRM activities, those that involve interaction between a professional source, a HRIS application and employees and/or management. Examples of relational HRISs are recruitment and selection systems, training and development systems and performance management systems. The system contains the professional instruments, such as a professional questionnaire assessing an employee's development level, and employees and management have the online

access to use them wherever, whenever. Transformational HRISs, the third type, are the ones for HR activities with a strategic character like organisational change processes, strategic re-orientation, strategic competence management. Examples of HRIS applications of this type are corporate online discussion platforms, weblogs or applications that guide employees through the objectives, stages and methods of an organisational change process, or applications for assessment of professional skills and offering online advice for skill development aligned with strategic HR objectives.

So far, large companies have tried to implement HRISs of all the three types whereas smaller and mid-size companies implemented mostly the operational and relational HRISs.

3.1 HRIS Research Up To Date

Research on HRISs started to take off in the second half of the 1980's, but it developed slowly and it for sure did not maturate. Research articles from those 'early days' are from [1]; [52]; [53]; [54]; [55]. The research topic received renewed attention with the growing importance of Internet technology. Since the second half of the 1990's organizations started to apply this technology for Human Resource Management purposes. 'Early birds' on the role of Internet-based applications for HRM in particular were [56] and [57]. However, these papers mainly aimed at outlining the importance of the issue, and limitedly empirical. Overall, [58] found 18 appropriate studies that can be labelled as empirical HRIS (he prefers to use the term e-HRM) studies, nine from the pre-Internet era, nine from the Internet-era. Table 1 lists the studies found by [58] and summarizes their results.

Only a few new empirical articles have appeared since Strohmeier's last study mentioned [50] was published. [59] studied the impact of e-HR on professional competence in HRM and found through interviews with HR professionals from 19 firms that "[HRIS] is a driving force in the transformation of the HR function" (p. 306). Their data suggest that this transformation is reshaping the competencies that define HR professionals' success (p. 306). [60] concludes that different types of middle managers, she distinguishes four, respond differently to HRISs. [61] and [62] conclude that especially the content and the structure of a web-based HRIS application has a positive influence on perceived HRM effectiveness.

Overall, we are of the opinion that HRIS research is in its infancy, though trying to mature if we look at conference initiatives and upcoming special journal issues and books on HRIS/e-HR. Existing research foci still need to be broadened and to be deepened in order to let HRIS research maturate. This conclusion becomes even more evident if we look at the theoretical development of the HRIS research area. [63] note, together with [64 were the first to provide a theoretical framework for HRIS adoption. [58] ignores even Shrivastava & Shaw's framework and only recognizes two studies that employ frameworks in order to systematise examined consequences: [65], and [50].

Table 1. List of appropriate HRIS studies identified by [58] and their outcomes.

	Study	N	approach	costs	headcount	efficiency	effectiveness
				Consequence dimension			
pre-e-HRM-era	Bueschel 1969	89	survey/ interview	↑O	-	-	-
	Morrison 1969	405	survey	↑O↓	↑O↓	-	↑O↓
	Tomeski & Lazarus 1974	87	survey	↓	-	-	-
	Ornati et al. 1982	261	survey	-	↑O↓	-	-
	Moore & Clavadetscher 1985	325	survey	↓O	-	↑O	-
	Verdin & Pagano 1987	81	survey	-	-	↑O	↑O
	Broderick & Boudreau 1991	10	case study	-	-	↑	-
	Forrer & Leibowiz 1991	47	survey/ interview	↓[O↑]	-	↑	-
	Kinnie & Arthurs 1993	1,000	survey	-	↑O↓	-	-
e-HRM-era	Baker et al. 1998	231	survey	-	-	-	↑O
	Teo et al. 2001	110	survey	O	↓[↑O]	↑[↓O]	-
	West & Berman 2001	222/14	survey/ interview	-	-	↑ ↓	-
	Chapman & Webster 2003	125	survey	↓[O↑]	-	↓[O↑]	-
	Gardner *et al.* 2003	357	survey	-	-	-	↑
	McManus & Ferguson 2003	19,578	survey	-	-	-	↑
	Buckley *et al.* 2004	1	case study	↓	-	↑	↑
	Hawking *et al.* 2004	1	case study	-	↓	↑	↑
	Ruël *et al.* 2004	5	case study	↓[O↑]	↓	-	-

↑ = increase   ↓ = decrease   O = no change   [ ] = implicit result   - = not examined

A very recent attempt to theorize and model HRIS drivers, intervening factors, and consequences comes from [66]. However, yet next to a limited empirical basis we observe that the HRIS field is also under-theorized, an opinion shared by [67] and [63].

In the next section will use the web of causes and consequences introduced in section two, relate them to HRISs and suggest topics and questions for theoretical and empirical research.

4   HRIS as an Integration of Organization and Information Systems: Emerging Research Questions

The phenomena introduced in sections one and two allows us to shine a light on HRISs in such a way that a specific type and area of research questions comes to the surface. With the help of existing case-based examples of HRIS implementations we will illustrate and emphasize specific relevant topic for future HRIS research.

4.1   The Automation of Tasks and Processes and HRIS

The automation of tasks and processes is an issue with wide ranging implications for HRIS. On one hand, the automation of tasks and processes causes a reduction in the use of the resources (financial, material and human) the firm needs to accomplish its tasks. On the other hand, it produces data (textualized information) as a bi-product. Both types of implications are relevant for HRIS research. As regards reduction of resources, [56] and [50] have addressed the issue of reduction of HR costs. These come mainly comes from reducing HR head counts, especially on the administrative side. For example, entering and managing HR related data as far as it is done manually by administrative HR employees can be relegated to HR information systems. By introducing front-end web applications, part of the HR data management can be transferred to employees and line managers. They can enter and update their personal data themselves. Once manually performed HR tasks and processes are being automated, resulting in job losses and job content changes for HR employees with administrative roles.

[50] describe how ABNAMRO, a large Netherlands-based bank, implemented an operational HRIS application that requested employees and managers to execute tasks formely done by HR through online applications. The bank experienced how difficult it was to convince managers and employees of the relevance of the new approach. [68] discuss the design of competence management systems (CMS) at Guide, a Swedish consulting firm and Volvo IT, Volvo´s gobal expertise center. This paper demonstrates not only the design principles of CMS but it highlights with clarity the role of automation in the processes of core competence formation and deployment in high performing organizations.

Issues for HRIS research to focus on are how employees and line managers respond to this transfer of HR related activities or on how to the organization copes with the new division of HR-related tasks between the employees themselves, the line managers, the IS department and the left over HR administrative staff. Further interesting questions are: what kind of tasks are left over after introducing new HRIS applications or how do the HR administrative staff, the line managers and the employees respond to their new tasks and expected new roles.

4.2   The Costs of IT: Expansion and Control

HRIS implementation and further expansion require impressive financial investments. State-of-the-art technology is expensive and the implementation process requests

hours of labour as project managers and project team members. On top of this employees and line managers have to learn to work with newly introduced HR applications. [50] found that at Ford the implementation of the HRIS was very much considered as a cost and not as something beneficial. Only due to top management support and a budget surplus the implementation could take place.

Implementing new HRISs will contribute to a company's overall IT costs. The question is whether this should be considered as a burden or as an investment. As HR in general is not a primary process, it is sometimes difficult to 'sell' the investment on new HRIS applications to the top management. Therefore it is very likely that HRIS implementation takes places especially during periods of expansion, but is hard to push forward in a control period.

HRIS research needs to provide answers to questions like: to what extent HRIS implementations are a consequence of a period of expansion? What happens to HRIS implementation in periods of control? Who are the main sponsors of HRIS investments and how do different types of sponsors affect HRIS implementation? How to obtain more clarity on issues such as increased productivity or the return on investment of HRISs? In other words, what is the relationship between the level of investment in HRIS, implementation success and the growth of organizational knowledge and skills? [I like it, HR]

4.3 New Forms of Managerial Control

HRISs can increase levels of managerial control for example through improved performance measurement and evaluation applications for line managers. The question is whether line managers are interested in higher levels of control and whether employees will accept higher levels of managerial control.

Regarding the circular impact of HRIS on and from the accumulated textualized information in the organization, there is a wide variety of decision support systems developed to combine and extract information in such a way that traditional management control has been totally redefined. Such systems have a direct impact on the way that the performance of employees can be monitored and improved by performing very fine cross-referencing of multiple variables and identifying relationships which were not possible to establish before. HRIS which perform control functions are also very relevant in the growth of the collective self-awareness of the organization as suggested by [69].

Questions for further research are: How do managers use the new possibilities for managerial control? How to match organizational culture with specific control habits and the control mechanisms and tool available? How do subordinates respond to managerial control via HRIS tools? What kind of coping strategies do subordinates employ with HRIS based managerial control? Are organizations more self-aware with the new HRIS tools?

4.4 Compression of Competitive Time

HRIS are part of the trend, time saving, responding to changes in the environment and therefore HRISs are needed. As [50] describe, increased global competition forced

Dow Chemicals to leave a so-called life-time employment model and switch to a life-time employability model; the company now guarantees opportunities to develop skills and qualifications, but not a job for life. Only through an HRIS the company could facilitate such an approach globally. Competition triggered Dow Chemicals to implement an HRIS.

Research questions emerging from this issue are to what extent do HRISs contribute to organizational flexibility? How can HRISs facilitate a flexible business strategy? How can HRISs be used to create a competitive advantage? The issue of competence-based management [70] and how it is being impacted by HRIS is surely a new topic for many research projects in this area.

4.5 Outsourcing

ICT has given a boost to outsourcing as digital connections can facilitate deliver services from a distance. Many companies have outsourced part of their HR services to third parties, and through ICT-based connections HR services are being delivered. IBM introduced their HRIS and along with it outsourced their HR service desk to a third party located in a low wages country in Eastern Europe. In practice it meant that if a line manager had a question on an HR issue and needed advice from HR, she or he could call or e-mail the outsourced HR shared service centre. HRISs have triggered possibilities of outsourcing HR services and challenge the role and position of internal HR staff.

The issues faced by the management of outsourcing are manifold, but one of the most complicated problem is the question of the loss of internal IS/IT-related knowledge in the company. Being an area so closely interwoven into the company's processes, routines and even into personal relationship that it is difficult to conceive a situation of total separation between IS/IT and the rest of the organization, in a move towards total outsourcing of IS/IT. HRIS research therefore needs to put more efforts in investigating the relationship between HRIS use and HR outsourcing. What are the consequences for HR effectiveness of outsourcing? To what extent do managers and employees trust outsourced HR services? How to balance internal, outsourced HR services and the employment of HRIS applications?

4.6 Convergence of Info-com

In organizations the convergence of info-com is materialized in their IS/IT infrastructure. IS/IT infrastructures are defined as a bundle of data/information processing and communication capabilities shared by the large majority of the company's organizational units. Such capacities include : (a) the human resources, with necessary technical and management knowledge and skills as well as the framework of rules, procedures and methodologies which guide their activity; (b) the company's data communications networks, its computer equipment, including mainframes, microprocessor-based servers and PCs; (c) the applicational infrastructure, that is, the group of software applications which address the business needs of the company; (d) the data contained in the software applications and its management which can also be considered as part of information infrastructure.

HRISs are a result of the growth of IS/IT infrastructures and of the increasing convergence of info-com. As this convergence continues, new innovative digital HRIS solutions are being developed and organisations are trying to integrate them in their day-to-day HR practices.

The growth of IS/IT infrastructures and of the increasing convergence of info-com raises question that HRIS research should pick up, such as: what are the pros and the cons of ongoing convergence for HR professionals, for front line managers, and for employees? What organisational needs trigger further convergence of information and communication technologies for HR purposes? What organisational barriers limit further convergence? How does the use of HRISS by managers and employees influence new directions for further convergence of information and communication technologies for HR purposes?

4.7 Organizational Knowledge as a Competitive Pressure

Human resource management in modern organisations means for a large part thinking in terms of knowledge management, as the main competitive asset for these organisations is knowledge. Knowledge means not only specific professional knowledge of employees needed for carrying out their jobs, but knowledge about business processes, about styles of interaction and collaboration between employees, and about knowledge sharing and development as well. With knowledge and knowledge development organisations compete with each other. Human Resource policies and practices need to fit and support organizational knowledge maintenance and development, and HRISs for their part need to be designed and implemented in such a way that their functionalities facilitate these processes.

HRIS research should be geared to providing answers to questions such as: in what way can HRISs support organisational knowledge development, sharing and maintenance effectively? What are the mechanisms through which HRISs facilitate organisational knowledge development? What are the mechanisms that inhibit HRIS-supported organisational knowledge development? How do employees integrate HRIS-supported organisational knowledge development in their day-to-day routines?

4.8 New Forms of Alignment

In contemporary organisations, HR strategy and practices need to be aligned with the overall business strategy. This should go even that as far as considering the overall business strategy as *the* HR strategy, as human assets are a companies most important assets in nowadays competitive business environment. HRISS are being used in forerunner companies to fully facilitate such an alignment. Once again Dow Chemicals can be used as an example. This company was fully aware of how important a right HR strategy was as part of the overall business strategy; employees' competences were critical for the company's success. Its HRIS reflected and tried to facilitate this competence based strategy in the way as described above.

[71] puts forward a cultural and behavioural framework for researching the alignment between IS/IT and organizational strategy. Many of the issues raised have a

direct link to HR strategy, meaning that the alignment between IS/IT strategy, business strategy and HR strategy is completely interwoven. It is suggested therefore that HRIS research should focus on questions such as: How can HRISs help to establish HR strategy-Business strategy alignment? To what extent do companies differ when it comes to creating HRIS-supported strategic alignment? What roles should HR professionals, employees, and managers fulfil in an HRIS-supported HR strategy-Business strategy aligned company? How might HR strategy be used to promote alignment between all forms of IS/IT applications (i.e. the IS/IT infrastructure) and the organization's processes, structures and strategies?

4.9 Organizational Change Orientation

Today, there is no other management than change management. It is an intellectual managerial stance, whose main and permanent concern is the building of bridges between strategic, long term change and operational, generally short term change. Is also a permanent concern regarding the convergence of the *knowing what* and the *knowing how* in the organization. In adopting a change management posture it is recognized, on one hand, that it is important to plan and to mantain a strategic perspective in long term but, on the other hand, that an undue emphasis on the *knowing what* does not solve the problem. It is equally recognized that the organization's emergent properties are as important as the managerial decisions that support the planned side of change which constitutes the *knowing how.*

HRISS can support such an organizational change orientation through providing employees and management with digital tools that will influence their behaviours and in this way affect the wider organisation. HRIS research should aim at answering questions such as: what are the conditions for successful HRIS-supported organisational change? How to support different types of organisational change with HRISS? How to overcome resistance against HRIS-supported organisational change?

4.10 Integrating the Information Systems Function With all Other Functions

Information systems and technologies are still regarded as rather marginal relatively to the rest of the organization. IS/IT are still structured in the traditional fashion, as one more function or vertical department in the organization. Staff of such a department are subject to inword looking performance evaluation disconnected from the horizontal implications of the IS/IT function (e.g HRISs). IS/IT Directors are more worried about defending their turf then looking at the larger business horizons. On the other hand, business managers are also inword looking as regards their own objectives and do not show much awareness regarding the numberless opportunities and constraints, that can be found in the management of information systems and technologies.

HRISs are the embodiment of the integration of IT and HR; information and communication technologies are designed and deployed in such a way that they support HR purposes and practices. For that end the IT function needs to be integrated with the HR function, if not with all the others as well, like sales, manufacturing, finance, and marketing. For example, companies like IBM, Ford, Dutch Telecom

KPN, Royal Dutch Airlines etc, they all have their IT function within the HR function in order to serve the wider organization as good as possible when it comes to HRISS.

In [72] a model for the integrated management of IS/IT is put forward. A new framework builds on the notions of "distributed organizing", "distributed knowledge systems" or "networking knowledge" and is based on the formation of IS/IT-related competencies within communities of *knowing* (communities of practice and of knowledge) formed by the various stakeholders intervening in the process of IS/IT corporate governance. Such a framework will enable HRIS research to focus on questions such as: How to integrate the IT function with HR successfully? What are HR roles that IT professionals should understand? What are IT roles that HR professionals should understand? How can IT professionals and HR professionals communicate effectively in order to design new HRIS functionalities?

5 Conclusions

This paper aimed at setting an agenda for HRIS research from an integrative perspective. This perspective assumes that organization and information systems cannot be separated, they are intertwined, as an opposite to perspectives that assume that information system can be isolated from their organisational context. By first elaborating on this integrated perspective in terms of a web of causes and consequences, a list of phenomena was presented. After that research on HRISS up to date was summarized, leading to the observation that HRIS research needs to be broadened and deepened. In section three, we combined the list of phenomena with how HRISS are being implemented and used in mainly large global companies. Per phenomenon we raised a number of critical questions for HRIS research to focus at and to provide answers for.

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