

Bondarouk, T., & Ruël, H.J.M. (2005). Does e-HRM contribute to HRM Effectiveness? Results from a quantitative study in a Dutch Ministry, *Paper presented at the 4th International Conference of the Dutch HRM Network, November 4 – 5.2006, Enschede, The Netherlands.* <http://hrmnetwork.utwente.nl/>

DOES E-HRM CONTRIBUTE TO HRM EFFECTIVENESS? RESULTS FROM A QUANTITATIVE STUDY IN A DUTCH MINISTRY

Tanya Bondarouk (University of Twente, The Netherlands)

Huub Ruël (University of Utrecht, The Netherlands)

Abstract

E-HRM is coming to a more full-grown stage within organisational life. Much is assumed and expressed about the advantages of e-HRM, however scientific proof of these advantages is scarce. No clarity exists about the answer to the question whether e-HRM contributes to HRM effectiveness. In this paper we present results from the first quantitative study on the contribution of e-HRM to HRM effectiveness. The data is collected in a Dutch ministry. Results show that actual use of the e-HRM application correlates with HR effectiveness, especially the content and design (= quality of the e-HRM application). Regression analysis confirms that the experienced quality of the e-HRM application is the only significant explanatory factor of technical and strategic HR effectiveness. In the final section of the paper conclusions are drawn, limitations discussed and future research directions raised.

Keywords: e-HRM, web-based HRM, HRM effectiveness, actual e-HRM use, technical HR effectiveness, strategic HR effectiveness.

INTRODUCTION AND RESEARCH FOCUS

Since the mid 1990s, organisations increasingly introduce electronic Human Resource Management (HRM). It has different names, for example e-HRM, digital HRM and web-based HRM. Notably is that its use is widely discussed in the reports of consultancy firms and professional HRM organisations (Watson Wyatt, 2002). It is acknowledged that practice- and consultancy-based e-HRM research started earlier than academic research. Therefore we begin with some findings from the “professional” e-HRM field.

In 2003 the Dutch Professional Association for Personnel Managers conducted the on-line e-HRM survey and replicated it in 2005 (NVP, 2005). Their questionnaire included three main parts: characteristics of organisations (size, sector, industry, availability of Information Technology for HRM); companies’ interests in e-HRM developments; and state-of-the-art of e-HRM in organisations. 370 respondents filled in the questionnaire in 2003, and 215 – in 2005. Among them, 26-29% represented large organisations (>1000 employees), 24-26% medium-sized organisations (251-1000 employees), and 50-45% small organisations (<250 employees) (in 2003 and 2005 respectively).

The findings of that research give the following indications about the e-HRM developments (numbers are provided as to the years of 2003 and 2005 where different): 62-63% of companies from the sample used e-mail, intranet and portal technologies for their HRM purposes. Companies stressed their high interests in: manager self-service (50%), e-HR portal (49 – 53%), e-HRM impact on employees' satisfaction (41 – 47%), impact of e-HRM on the HR departments (40%), employee self-service (40%), and HRM workflow automation (37%).

The HRM portal (36-40%) and e-recruitment (32%) were the two highest rated applications (based on their functioning in line with expectations). The lowest scored applications according to the companies were e-coaching, e-assessment, e-learning, and e-competence management. Three success factors for implementing e-HRM were noticed as the most important: communications within an organisation about e-HRM, qualities of the applications, and commitment of the management.

If we look at the data from the NVP research, what can be said? Although strict conclusions are difficult to make, we may say about some symptoms, or identifications of "practical" e-HRM patterns. Earlier we wrote that companies progressively more implement e-HRM (Ruël et al, 2004). A new observation now is that HRM professionals (and their companies) are not surprised anymore by the e-HRM phenomenon; they have reached a "grown up" stage, and are ready for the serious discussions about it. Second, companies spot high interests in getting more insights in the ways how to implement e-HRM applications and how e-HRM impacts organisational life. Third, and the most intrigue, while the interests in e-HRM are growing, the appreciation of e-HRM and expectations from it seem to decrease.

These preliminary observations gear us to such questions like:

- What do we mean by e-HRM in general and by its specifications like e-recruitment, e-learning, e-benefits, e-competence, e-assessment, employee self service, manager self service, e-performance management and e-coaching, to name but a few?
- Can e-HRM truly offer companies competitive advantage or does it represent a competitive necessity?
- What are the impacts of e-HRM on organisational life?
- And what are the changes in the work of HR professionals brought about by e-HRM?
- Does e-HRM bring new substantial development in organisations and does it really pay to be innovative?

Academics devote growing attention to examining e-HRM in attempts to answer some of these questions. Within a decade of its history, scientific knowledge about e-HRM has assembled several conclusive notions about goals of e-HRM (Ruël et al, 2004), its types (Lepak and Snell, 1998), effectiveness of different e-HRM applications, and implementation of Human Resource Information Systems.

In theory, there is a sound belief that e-HRM should facilitate the role of HR as strategic partner by freeing staff from the burdens of administration towards undertaking critical people management activities (Lepak and Snell, 1998). Although, recent studies found that in nearly half of companies with a completely integrated HRIS, HR was not viewed as a strategic partner (Lawler and Mohrman, 2003).

However, it is still unclear what the full advantages of e-HRM are. Does e-HRM contribute to HRM effectiveness? In order to reduce the confusion, our paper presents the results of the first quantitative study on the contribution of the actual use of e-HRM to HRM effectiveness. The study was conducted in the Dutch Ministry of the Interior and Kingdom Relations.

This paper is organised as following: first it will dive into theoretical backgrounds of HRM effectiveness studies and e-HRM studies. A research model and hypotheses will be presented after that. Then the paper will explain about the research methods used, and after that findings will be presented. The final sections is dedicated to conclusions, discussion and future research directions.

THEORETICAL BACKGROUND

HRM effectiveness: approaches, definitions, challenges

HRM effectiveness is addressed by a great number of studies that strive to demonstrate the value of what HR professionals do for the rest of the organization and how HRM practices are linked to desired organisational outcomes (Huselid, 1995; Boxall and Purcell, 2003; Baron and Kreps, 1999, Wright et al, 2001). Following Wright et al (2001), we see that attempts to demonstrate the HRM effectiveness have focused in a few areas.

HRM – firm performance

HRM effectiveness is often mentioned as HRM contribution to firm performance (*see*, for ex., Kane et al, 1999; Ostroff and Bowen, 2000; Wright et al, 2001). Especially during the past decade the HRM literature made attempts to show that progressive HR practices result in higher firm performance (Wright et al, 2005; Hope Hailey, 2005). Huselid's (1995) pioneering study has shown that a set of HR practices labelled High Performance Work Systems were related to turnover, accounting profits, and firm market value. Since then, a growing number of studies have attempted to empirically test the relationships between HR practices and firm performance (*see* elaborated overviews by Delery and Doty, 1996; Ostroff and Bowen, 2000; Boselie et al, 2001; Tsui and Wang, 2002; Wright et al, 2005). For example, MacDuffie (1995) has found that bundles of HR practices were related to productivity and quality in his sample of auto assembly plants. Delery and Doty (1996) found significant relationships between HR practices and accounting profits among a sample of banks. Youndt et al (1996) discovered that certain combinations of HR practices in their sample of manufacturing firms were related to operational performance indicators. More recently, the study of Batt (2002) examined the relationship between HR practices, employee quit rates, and organisational performance in the service sector, and revealed that quit rates were lower and sales growth was higher in call centres that emphasised high skills, employee participation, and human resource incentives like high employment security.

The international arena of recent studies into HRM-firm performance is quite broad. A quantitative research in sixty-two manufacturing Chinese-Western joint ventures has shown a positive relation between firm performance and the extent to which firms from the sample used a 'high-performance' HRM system as well as the degree to which they engaged in the integration of HRM and firm strategy (Bjorkman and Xiucheng, 2002). Another study, conducted among fifty-two Japanese multinational corporation subsidiaries (Park et al, 2003) has revealed that the relationships between HR systems and firm outcomes in the sample were mediated by employees skills, attitudes and behaviours. The survey of 102 Israeli organisations has shown positive associations between HRM practices stressing promotion of women and organisational effectiveness (Harel et al, 2003). The study of forty-five software companies from India by Paul and Anantharaman (2003) has shown that each and every single HRM practice from the sample had an indirect influence on the operational and financial organisational performance. Findings from another study, conducted by Datta et al, (2005) among 132 publicly traded manufacturing companies in USA, indicate that the impact of high performance work systems on productivity is influenced by industry capital intensity, growth, and differentiation.

Conceptualising HRM approaches

Certainly, the existing research suggests a positive relationship between HR and firm performance, and calls such HRM effective. However, despite research conducted into the linkage between HRM and firm performance has been dominating much of the debate within the HRM literature since the 1990-s and got recognition and empirical evidence world-wide, researchers acknowledge that there is no "agreed conceptualisation of how this relationship

between HRM and firm performance actually works” (Hope Hailey et al, 2005, p. 50). The so-called “best practices” approach strives to uncover a generic set of high performance HR practices (ex., Arthur, 1994; Youndt et al, 1996; Pfeffer, 1998); “best fit” approach focuses on aligning HRM strategies to internal organisational strategies and policies, and external contextual conditions, and introduce the concept of strategic HRM that contributes to superior organisational performance (ex., Schuler and Jackson, 1987; Delery and Doty, 1996; Wright et al, 2001; Gratton and Truss, 2003); “resource based view” attributes firm performance to skilled, motivated, satisfied, committed employees who are “shaped” by HRM practices (Lado and Wilson, 1994; Boxell, 1996; Ostroff and Bowen, 2000; Boxall and Purcell, 2003).

Recently, the resource-based view of the firm has incorporated a “best fit” perspective (Datta et al, 2005). Guided by this notion, our position is that HRM practices are considered effective if they increase the quality of the employees by promoting their skills, attitudes, competencies that are strategically planned to achieve; and elicit from them valuable behaviour, which lead to a unique combination of human capital that is difficult for competitors to replicate (Lado and Wilson, 1994; Wright et al, 1994; Boxall, 1996; Ferris et al, 1999). The notion of “fit” is embedded in the resource-based view through two primary means: resources contribute to firm performance depending on strategic and HRM goals, and firm’s competitive environment. An important issue for our research is based on this perspective - HRM practices are considered to be effective when they promote strategically expected employees behaviours, which contribute to desired organisational outcomes.

Technical and strategic effectiveness of HRM

Huselid et al (1997) have introduced the concept of technical and strategic effectiveness of HRM guided by the idea that HRM seeks approval for its activities in “socially constructed environments” (p. 172). Meeting expectations of stakeholders means for HRM gaining legitimacy and acceptance in the organizations and in the eyes of external entities. Research of Tsui et al (1997) has found that expectations from ‘traditional’ HRM activities, or HR services (Wright et al, 2001), tend to be similar for all firms. These traditional HRM activities called “technical” (Huselid et al, 1997), were shown to be more effective in the eyes of the stakeholders.

In contrast to technical HRM activities, “strategic” HRM activities are considered as relative HRM innovations for companies. Huselid et al (1997) notice that, despite of absence of full agreement on strategic HRM, there is a broad acknowledgement that it involves development and implementation of the policies aligned with business strategy. They found that strategic effectiveness was significantly associated with firm performance, but technical HRM effectiveness was not associated with firm performance.

Being nowadays more and more confronted with electronic HRM, we should notice that we are left to wonder as to what extent the use of e-HRM makes HR effective. Put in other words, if an organisation decides to introduce digital HRM, will HR processes have a desired impact on employees’ skills, behaviours, and attitudes? And what are the conditions for e-HRM to be met in order to contribute to strategic and technical HRM effectiveness?

e-HRM research up-to-date

Based on the view on HRM practices as communications from the employer to employees about HRM content (Guzzo and Noonan, 1994; Bowen and Ostroff, 2004), we define e-HRM as the directed and IT-networked communications from the employer to employees about HRM content. This definition resonates findings from earlier research that e-HRM directly involves all employees in HRM processes due to the technological networks, and gives the opportunity to HR professionals to mainly focus on encouraging desired employees’ behaviors (Ruël et al, 2004).

Research evidence suggests that in many organisations e-HRM has led to radical redistribution of what managers do. Many of the reporting activities, previously performed by HR professionals, now can be performed by managers and employees on-line (Ruël et al, 2004; Ruta, 2005). On their desktops, managers have to perform appraisals, evaluate employee costs, generate HR reports (turnover, absenteeism), process training requests and competence management. Employees have the access to everything they need to change and manage their personal files, plan their development, process financial documents, and apply for new jobs (Roehling et al, 2005).

Within a decade of its history, scientific knowledge about e-HRM has assembled several conclusive notions that are summarised below.

e-HRM goals

Lepak and Snell (1998) refer to the four ‘pressures’ of virtual HRM. First of all, HRM departments are asked to focus on strategic questions. Secondly, these departments need to be flexible in terms of policymaking and practices. Thirdly, HRM departments should work efficiently and be aware of costs. Fourthly, HRM departments should be service-oriented towards management and employees. In short, HRM departments must be strategy-focused, flexible, efficient, and client oriented; and all at the same time (Lepak and Snell, 1998). Ruël et al. (2004) highlighted an aspect that is fairly well covered by the above but that is nevertheless interesting to spell out, namely the changing nature of the employment relationship. With the supply shortage in the labor market (during the economic upturn of the 1990s), the individualization of society, and the increased educational level of citizens (and thus of employees), the power balance in the employment relationship has shifted in the direction of the employees: they want to steer their own career paths. In the view of Ruël et al. (2004), a move towards e-HRM can provide the tools to support this development. This aspect fits into earlier-mentioned drivers such as improving service towards internal clients, but has an external societal drive. Yet another goal of e-HRM was stressed as the outcome of the case study research conducted by Ruël et al (2004): it is necessary to recognize that to improve a company’s global orientation can become a strong drive to start with e-HRM. Theoretical debates suggest three goals of e-HRM are cost reduction, improving of HR services, and improving strategic orientation (Brockbank, 1997; Lepak and Snell, 1998; Stanton and Coovert, 2004). Few empirical findings supplement these goals with globalisation as a driving e-HRM force in international large organisations, but also show that those goals are not clearly defined in practice, and that e-HRM mostly directed at cost reductions and efficiency of HR services, and least – at strategic orientation of HRM (Gardner et al, 2003; Ruël et al, 2004; Ruta, 2005).

Based upon the above, we conclude about the reasons or goals of organizations making steps towards e-HRM: 1. Improving the strategic orientation of HRM; 2. Cost reduction/efficiency gains; 3. Client service improvement/facilitating management and employees; 4. Globalisation.

e-HRM types

The current e-HRM literature distinguishes three types of e-HRM. E-HRM is considered as not a specific stage in the development of HRM, but as a choice for an approach to HRM. Wright and Dyer (2000) distinguish three areas of HRM where organizations can choose to ‘offer’ HR services face-to-face or through an electronic means: transactional HRM, traditional HRM, and transformational HRM. Lepak and Snell (1998) make a similar distinction, namely operational HRM, relational HRM and transformational HRM. The first area, operational HRM, concerns the basic HR activities in the administrative area. One could think of salary administration (payroll) and personnel data administration. The second area, relational HRM, concerns more advanced HRM activities. The emphasis here is not on

administering, but on HR tools that support basic business processes such as recruiting and the selection of new personnel, training, performance management and appraisal, and rewards. Transformational HRM, the third area concerns HRM activities with a strategic character. Here we are talking about activities regarding organizational change processes, strategic re-orientation, strategic competence management, and strategic knowledge management.

The areas mentioned could also be considered as types of HRM that can be observed in practice. In some organizations, the HRM emphasis is on administration and registration, in others on the application of operational HRM instruments, and in a third group the HRM emphasis is on its strategic role. Within all the types of HRM, choices can be made in terms of which HRM activities will be offered face-to-face, and which will be offered through web-based HR (e-enabled). This question, for the operational type of HRM, provides the choice between asking employees to keep their own personal data up-to-date through an HR website or to have an administrative force in place to do this. For relational HRM there is the choice between supporting recruitment and selection through a web-based application or using a paper-based approach (through advertisements, paper-based application forms and letters etc.). Finally, in terms of transformational HRM, it is possible to create a change-ready workforce through an integrated set of web-based tools that enables the workforce to develop in line with the company's strategic choices or to have paper-based materials.

Ruël et al (2004) have shown that although in practice these types are mixed, important is that “establishing a good basis for e-HRM at the operational level seems to be an essential prerequisite for the relational and transformational e-HRM; and that it requires changes in the tasks of HR professionals (less paper-based administration, more e-communications with employees, skills for operating IT). Placing companies along e-HRM types doesn't mean assessing their e-HRM. None- of the types can be judged as good or bad but their qualities. It was shown that there is a ‘gap’ between e-HRM in a technical sense (the available functionality) and the use and adoption of it by employees and line managers. The actual usage/adoption lags behind what is possible.

Implementation and use of e-HRM

A lot has been done in the research into information technologies for HR purposes. Beginning in the 1960-s, personnel management was an early candidate for office automation in payroll, benefits administration, and employee records holding (Ball, 2001). Typically this information was stored in flat databases being interrogated via simple key words searching. Growth in strategically focused HRM produced demands for information and communication developments in Human Resource Information Systems (HRIS). Early studies into HRIS demonstrated the “hesitant” use of HRIS by HR practitioners who perceived IT as workhorses of the personnel function (Hall and Torrington, 1998).

Empirical reports since then have indicated that the use of HRIS has become more confident although still mainly for administrative purposes; and that HRIS projects mainly remain technology-driven events, with the focus on growing sophistication of information technology (IT). In this context, studies keep their focus on qualities of IT, necessary for its usage by the HR departments (Kavanagh et al, 1990; Haines and Petit, 1997; Keebler and Rhodes, 2002; Fisher and Howel, 2004).

For example, in their survey among 152 users of HRIS, Haines and Petit (1997) found a number of individual/task, organisational, and system conditions that support successful HRIS. Although the relationship with the system usage was found to be weak, the links with user satisfaction were strong. This was the case for many of the system conditions like training, documentation, the presence of on-line applications, the ease of use, and the perceived usefulness of the system. Another quantitative study in 115 organisations actively used HRIS, conducted by Ball (2001) has revealed that: the organisation size is a clear determinant of, first, whether an organisation has an HRIS at all, and second, whether it

adopts certain modules (e.g. core personnel administration) over others (e.g. training and competence management). The type of HRIS is also shown to be determined by the organisational size: the smaller companies (less than 500 employees) would go for low cost and low risk HRIS, more flexible software or in-house developed (Thaler-Carter, 1998; Ball, 2001).

More recent studies into the implementation of e-HRM make a shift towards addressing the dynamic nature of the HRIS implementation and using such concepts like innovation implementation, learning, change management, Technology Acceptance Model (Keebler and Rhodes, 2002).

Incorporation of the Technology Acceptance Model (Davis et al, 1989) into e-HRM studies has resulted in notions that the use of e-HRM by the targeted employees is highly determined by the level of usefulness of the HR information technology and easiness of its use (Ruta, 2005; Voermans and Van Veldhoven, 2005). The design of HRIS is considered as done but not fixed in the traditional development stage. A recent example is the study into the implementation of HR employee portal in the Italian subsidiary of Hewlett-Packard (Ruta, 2005). The research has demonstrated that the usage of HRIS increased when IT user acceptance principles were integrated with change management principles when the IT user acceptance model focused on “what” predicted intentions to use the HR portal, while change management theory focused on “how” intentions to use the HR portal could be influenced. It was shown that by analysing the context (at both industry and company levels), change agents managed to adopt the most appropriate actions to support the HR portal implementation.

Our concluding observation at this point is that many of the findings in the implementation of e-HRM (or HRIS) substantiate the expected relationships and dynamics of the implementation process derived from the research into information systems. Therefore, due to the latest developments, implementation of e-HRM can be compared with the drifting process (Ciborra, 1996) that divides intended goals and achieved outcomes of the e-HRM implementation.

RESEARCH MODEL AND HYPOTHESES

The Technology Acceptance Model (TAM) developed by Davis et al (1989) states that users will accept and therefore use a system if it has a significant perceived usefulness and ease of use. People tend to use (or not) an application to the extent that they believe it will help them perform their job better (perceived usefulness, or job relevance). Further, even if people believe that a given application is useful, they may believe that the systems are too hard to work with and that the performance benefits of usage are outweighed by the efforts required using the application (ease-of-use).

At the same time, users will work with the technology if the latter has proper technological qualities (content functionality) that are shown to have a direct and significant effect on the acceptance and use of the technology (DeLone and McLean, 2002). Such system characteristics like information quality, reliability, and system efficiency were validated to determine the use of the information technologies (Taylor and Todd, 1995; Igbaria et al, 1997; DeLone and McLean, 2002).

It was also shown that usefulness is more strongly linked to the behavioural intentions of users and actual system use than ease-of-use. Across the many empirical tests of TAM, perceived usefulness has consistently been a strong determinant of the usage intentions of employees (Venkatesh et al, 2003).

Assuming that the use of e-HRM applications is influenced by the aforementioned determinants, we make a step further and propose to look at the link between the e-HRM use and HRM effectiveness. Companies start with e-HRM because of anticipated advantages that are expected to result in a more effective HRM. Thus,

Hypothesis 1: Easiness of use, quality, and job relevance of the e-HRM application are positively related with technical and strategic HRM effectiveness.

Hypothesis 2: Quality and job relevance of the e-HRM application are better explanatory factors for strategic HRM effectiveness than its easiness of use.

Hypothesis 3: Easiness of use of the e-HRM application is a better explanatory factor for technical HRM effectiveness than its quality and job relevance.

These hypotheses are visualised in the research model below.

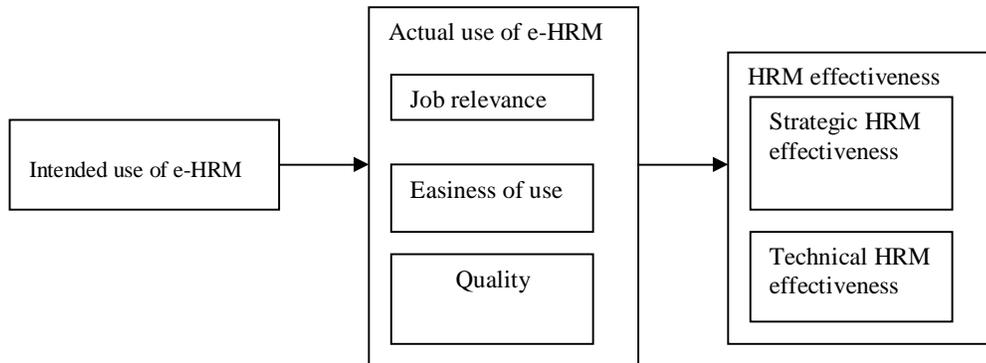


Figure 1. Research model: impact of actual use of e-HRM on the HRM effectiveness

RESEARCH METHODS

Measures

In our study we aim at testing the research model based upon data collected through a written on-line questionnaire.

Based on the extensive review of the literature, the questionnaire included scales on five major variables: job relevance of the e-HRM application, its easiness of use, quality of the applications, strategic HRM effectiveness, and technical HRM effectiveness. Every item was 'scored' on a five-point-scale, 1 = fully disagree, 2 = disagree, 3 = partly agree, partly disagree, 4 = agree, 5 = fully agree.

HRM effectiveness

Our research is rooted in the conception that HRM practices do not have a direct impact on employees' behaviours and organisational outcomes; rather these practices are first perceptually filtered and interpreted by employees (Ostroff and Schmitt, 1993; Klein and Sorra, 1996; Tsui et al, 1997).

Strategic HRM effectiveness refers to employees' perceptions of how well the HRM function promotes employees' behaviors that support organizational needs (adapted from Huselid et al, 1997). Three dimensions are distinguished: commitment, development and change. We turned them into six items, with a sufficient internal consistency ($\alpha=0.64$). The technical effectiveness refers to employees' perceptions of how well the HRM function performs operational HR activities (adapted from Huselid et al, 1997). We distinguished two

dimensions: work conditions and communication and turned them into five items with a sufficient internal consistency ($\alpha=0.79$).

Actual use of e-HRM applications

The easiness of use is defined as the extent to which a user of an e-HRM application finds the application uncomplicated in its operation and interaction. The dimensions that we turned into five items are: input of efforts and simplicity. The internal consistency of the five items formulated is high ($\alpha= 0.84$).

Quality of the e-HRM application is defined as the extent to which a user finds the application well designed and well set up in its content. With this we focus on the content functionality and leave aside – although very important – technical software architectural characteristics. We distinguished two dimensions: content and design, and turned it efficiently into five items with a high internal consistency ($\alpha= 0.83$).

Job relevance is defined as the extent to which users believe that using an e-HRM tool is critical to their work situation. Job relevance consists of two dimensions, increase of efficiency and increase of productivity, and those are turned into four items. Their internal consistency is high ($\alpha = 0.81$).

Setting the stage

The Ministry of the Interior and Kingdom Relations (called further as Ministry) is one of the thirteen ministries of Dutch central government. The two ministers and almost 3,000 civil servants formulate policy, prepare legislation and regulations, and are also responsible for coordination, supervision and policy implementation.

The documents analysis shows its mission as to: uphold the Constitution; guarantee the democratic rule of law; ensure an effective and efficient public administration; coordinate urban policy; promote public order and safety and provide centralised management of the countries police forces; promote the quality of the civil service and coordinate management and personnel policy for all civil servants; and coordinate cooperation with Aruba and the Netherlands Antilles.

The Ministry has six main departments (directorates): Directorate-General for Public Service Management, Directorate-General for Kingdom Relations and Governance, Directorate-General for Public Order and Safety, Directorate-General for the action plan 'Different Government', General Intelligence and Security Service, and Office for the Development of the Senior Public Service. The Ministry also includes a department for Joint Services. This division helps the Ministry's senior civil servants and the directorates-general in the areas of finance, personnel, information systems and communications, organisation, public information, and support services.

In the 1990s there was a growth in the use of information- and communication technology at the Dutch ministries. Almost all workspaces got personal computers; e-mail replaced messages on paper and notitions; and there was access to the Internet. All the ministries developed their own intranets. Intranet became an important medium for communication with the personnel. The personnel department liked to use this medium to announce news and to give information about HR-related issues. At first, the intranet replaced paper folders and manuals for HRM, by putting it online. During the mid 90s it became clear that there were more possibilities, like storage of data, searching for information and handling administrative processes.

In 2001-2002, the Ministry introduced Emplaza as an e-HRM tool to provide employees, managers and HR personnel with instruments and information to perform their tasks on personnel area correctly. Anyone has the access to find data, start work processes, submit

forms and find information from their own workspace. The system makes sure that the coherence between information, instruments and processes works optimal.

Procedure

From the total population we selected a stratified sample, in order not to 'exhaust' all employees with another invitation to fill up a questionnaire. Therefore we selected respondents and tried to involve all age categories, male and female, all ranks and units. Especially, it was preserved that there would be at least a relevant number of managers involved. All in all, we selected 277 organisation members, 186 employees, 47 managers and 44 HR professionals. They received an e-mail with an invitation to participate in our study and they could click on a hyperlink in order to go to the questionnaire. The response rate was 36% or in absolute terms 100 respondents, 54 male, 46 female. The electronic tool used for this did not allow respondents to leave questions open, so therefore we did not have missing values.

For the testing the hypotheses we used correlations (hypothesis 1) and regression analysis (hypothesis 2 en 3).

FINDINGS

Goals of Emplaza

The document analysis has shown that during the development of Emplaza at the Ministry, the goals were changed.

The Emplaza project documents dated in October 2002 show that its goal in the first phase of the HRM Department Store (HDS) was the realisation of three functional clusters. They were considered as a coherent set of information and web application that are focused on: the increase of efficiency and quality of administrative processes; the generating and spreading of management information; the development of the employee and the organisation. The overall goal was formulated as increasing efficiency and improvement of the quality of HRM at the Ministry.

In January 2003 Emplaza got a new direction, with the primary aim to improve employee self-service. By this there was a hope to achieve independent development of the employees, and to support managers in HR tasks.

November 2003 has brought yet a new orientation for Emplaza. Increase of efficiency in the administration (setting of a task and general efficiency), decrease of vulnerability and mistake percentages in administrative processes, working with employee and manager self-service concepts, effective support of the introduction of the new HRM policy, and supporting the changes in the organisation, including the decrease of the support by decentral P&O employees, - were documented as up-dated goals of Emplaza.

Our observations at this point are that the goals of e-HRM at the Ministry have changed several times within two years. Although the goals have changed, the overall tendency was cost reduction and making the administrative processes more efficient.

Functionalities of Emplaza

Users of Emplaza are HR professionals, managers, and employees. They have possibilities to perform the following activities via Emplaza:

- Search and read information about internal and national HRM policies;
- Store personal information for HRM purposes (digital personnel file);
- Process transactions in the area of HRM (filling in of forms, address changes, course enrollment);

- Produce HRM products (letters, reports).

The processing is digital that creates a continuous insight in the status and the handling of the data.

Figure 2 shows the startpage of Emplaza, when an employee logs in. It shows the different functionalities mentioned above. Emplaza is divided into three parts: one for an employee, one for a manager and one for an HR specialist.

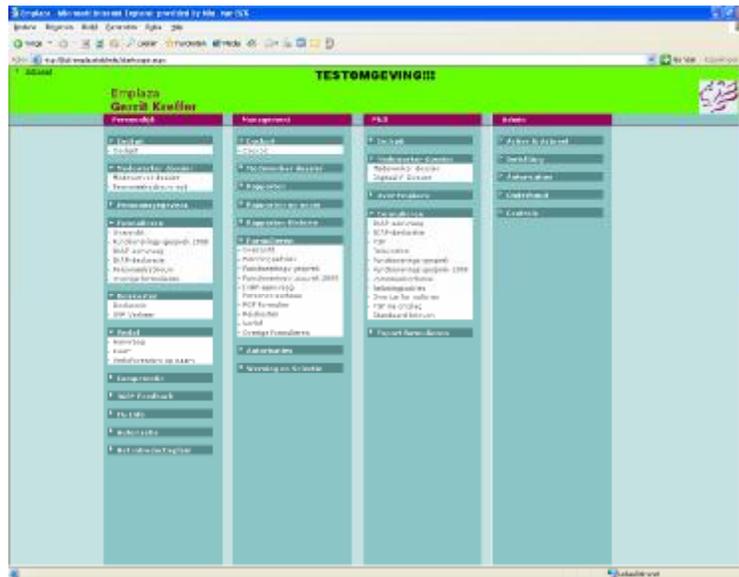


Figure 2. Screenshot of Emplaza

Survey results:

Hypothesis 1: Easiness of use, quality and job relevance of the operational e-HRM application are positively related with technical and strategic HRM effectiveness

The data analysis showed a positive significant relationship between easiness of use of Emplaza and technical HR effectiveness ($r = 0.22$; $p < 0.05$; $n = 100$) and between quality of Emplaza and technical HR effectiveness ($r = 0.38$; $p < 0.01$; $n = 100$), but *not* between job relevance of Emplaza and technical HR effectiveness ($r = 0.17$; $p < 0.098$; $n = 100$) (see table 1 appendix for correlation matrix).

Analysis of the data also showed a positive significant relationship between ease of use of Emplaza and strategic HR effectiveness ($r = 0.41$; $p < 0.01$; $n = 100$) as well as between quality of Emplaza and strategic HR effectiveness ($r = 0.50$; $p < 0.01$; $n = 100$) and between job relevance of Emplaza and strategic HR effectiveness ($r = 0.39$; $p < 0.01$; $n = 100$) (see table 1 appendix for correlation matrix).

This first hypothesis therefore is confirmed meaning a confirmation in line with the basic line of our e-HRM effectiveness improvement theory, but of course keeping in mind that it is tested in a limited empirical setting.

Hypothesis 2: Quality and job relevance of the operational e-HRM application are significant explanatory factors for strategic HRM effectiveness, easiness of use of the operational e-HRM application is not.

The analysis showed that only quality of Emplaza is a significant predictor of strategic HRM effectiveness ($\beta = 0.35$; $p < 0.05$; $n = 100$) (see table 2 appendix). That means that how employees and managers judge the content and design of Emplaza explains the extent to which employees and managers perceive HR as strategic effective. It is surprising that job

relevance does not show to be a significant predictor for strategic HR effectiveness. As expected, easiness of use is not a significant predictor of strategic HR effectiveness.

Hypothesis 3: Easiness of use of the operational e-HRM application is a significant explanatory factor for technical HRM effectiveness, quality and job relevance of the operational e-HRM application are not.

The analysis showed that surprisingly, although already suggested by the weak correlation, easiness of use is not a significant explanatory factor for technical HR effectiveness. Unexpectedly, quality of Emplaza seems to be a quite strong predictor of technical HR effectiveness ($\beta = 0.41$; $p < 0.001$; $n = 100$) (see table 3 appendix).

CONCLUSIONS, DISCUSSION AND FURTHER RESEARCH

Based upon, what we called, the e-HRM effectiveness improvement theory, we formulated four hypotheses related to operational e-HRM and HR effectiveness. Our study showed the first empirical confirmation that in general positive use of e-HRM applications facilitate an improvement in HR effectiveness. Analysis of our data, collected in the Dutch Ministry of Internal Affairs and Kingdom relations, showed that positive actual use of Emplaza, the Ministry's operational e-HRM application, got along with more positive perceptions of HR effectiveness. Easiness of use and the quality of Emplaza correlate significantly with technical and strategic HR effectiveness. Job relevance correlated only significantly with strategic HR effectiveness.

Regression analysis made quite clear, however, that actually only quality of Emplaza, meaning the content and design, is a significant predictor of technical and strategic HR effectiveness. Easiness of use of Emplaza and, as expected from the result from the correlations, job relevance of Emplaza do not show to be significant predictors. These results are partly unexpected and therefore interesting. They confirm at least the expectation that it is the content and the design of a web-based HRM application that can make employees and managers more positive about HR effectiveness. A web-based HRM application obviously needs to be easy in use and relevant for the job situation of employees and managers, but this will not result in a more positive perception of HR effectiveness. This finding is relevant for further theory building and for the practice of e-HRM implementation. Although we have to be careful because of the limitation of the data set used, for practitioners there is a clear guideline: they should dominantly focus on the quality of the e-HRM application, i.e. the content and design, instead of on easiness of use and job relevance, if to make e-HRM contribute to HR effectiveness. It indicates that HRM activities are not perceived as employees' primary tasks. A measurement with line managers may have led to other outcomes, if the organisation's HR policy would be that operational HR is basically a line managers task.

For further theory building our findings must lead to reconsidering how actual use of e-HRM applications should be operationalised in future research. The constructs easiness of use and job relevance might be replaced by other, as our study gives a first basis to assume that these two constructs are weakly related to HR effectiveness but do not show to be significant predictors of technical and strategic HR effectiveness.

Earlier we referred already to limitations of our study. Mainly, they concern in our view the following three:

First of all, our results need to be handled with care. The dataset we could build up is relatively small, although quite robust for applying statistical methods. Mainly the fact that the data comes from only one organisation is a limitation where one type of e-HRM application was in use.

Second, the type of e-HRM in the Dutch ministry was operational. That means that the results can be generalized to a relational and a transformational type of e-HRM.

Third, the measurement of the constructs needs a careful reconsideration. We tested the reliability on the same dataset as where we tested the hypotheses. The constructs might need a stricter test including also a factor analysis. In this study we found the dataset too small to conduct a factor analysis, a future study should carry this out.

Future research

E-HRM is young field of academic attention. Research in this field was poor on theoretical depth and thoroughness. In this paper we made an attempt to contribute to enriching the field through a elaborative literature study and through formulating a thin but relevant basis for theory building. Our proposed e-HRM effectiveness improvement theory needs extension and elaboration, for example by strengthening the conceptualisations and by involving context variables.

Acknowledgement: the authors are grateful to Ms. Lisa Marie Pasveer, MA, and Ms. Tessa Hanevelt, MA, for carrying out the data collection process.

References

- Arthur, J.B. (1994). Effects of human resource systems on manufacturing performance and turnover, *Academy of Management Journal*, 37, 670 – 687.
- Ball, K.S. (2001). The use of human resource information systems: a survey, *Personnel Review*, 30, (6), 677 – 693.
- Baron, J.N., & Kreps, D.M. (1999). *Strategic Human Resources*. John Wiley & Sons. Inc.
- Batt, R. (2002). Managing customer services: human resource practices, quit rates, and sales growth, *Academy of Management Journal*, 45, (3), 587 – 597.
- Björkman, I., & Xiucheng, F. (2002). Human resource management and the performance of Western firms in China, *The International Journal of Human Resource Management*, 13, (6), 853 – 864.
- Boselie, P., Paauwe, J., & Jansen, P.G.W. (2001). Human resource management and performance: lessons from the Netherlands, *The International Journal of Human Resource Management*, 12, (7), 1107 – 1125.
- Boxall, P., & Purcell, J. (2003). *Strategy and Human Resource Management*. Palgrave Macmillan: New York.
- Boxall, P. (1996). The strategic HRM debate and the resource-based view of the firm, *Human Resource Management Journal*, 6, 59 – 75.
- Bowen, D.E., & Ostroff, C. (2004). Understanding HRM-firm performance linkages: the role of the “strength” of the HRM system, *Academy of Management Review*, 29, (2), 203 – 221.
- Brockbank, W. (1997). HR’s future on the way to a presence, *Human Resource Management*, 36, (1), 65 – 70.
- Cedar Consulting (Eds.) (2003). Cedar 2002 Human Resources self-service/ portal survey, Baltimore.
- Ciborra, C.U. (1996). Introduction. In: C.U. Ciborra (Eds.) *Groupware & Teamwork: Invisible Aid or Technical Hindrance?* Wiley, Chichester, U.K.
- Datta, D.K., Guthrie, J.P., & Wright, P.M. (2005). Human resource management and labor productivity: does industry matter? *Academy of Management Journal*, 48, (1), 135 – 145.
- Davis, F.D., Bagozzi, R.P., & Warshaw, P.R. (1989). User acceptance of computer technology: a comparison of two theoretical models, *Management Science*, Aug. 1989, 35, (8), 982 – 1004.
- Delery, J.E., & Doty, D.H. (1996). Modes of theorizing in strategic human resource management: tests of universalistic, contingency, and configurational performance predictions, *Academy of Management Journal*, 39, (4), 802 – 835.
- DeLone, W.H., & McLean, E.R. (2002). Information systems success revised, *Proceedings of the 35th Hawaii International Conference on Systems Science*, IEEE Publications.
- Ferris, G.R., Hochwater, W.A., Buckley, M.R., Harrel-Cook, G., & Frink, D.D. (1999). Toward a social context theory of the human resource management-organisation effectiveness relationship, *Human Resource Management Review*, 8, 235 – 264.

- Fisher, S.L., & Howell, A.W. (2004). Beyond user acceptance: an examination of employee reactions to information technology systems. *Human Resource Management*, Summer/Fall 2004, 43, (2&3), 243 – 258.
- Gardner, S.D., Lepak, D., & Bartol, K.M. (2003). Virtual HR: the impact of information technology on the Human Resource professional. *Journal of Vocational Behaviour*, 63, 159 – 179.
- Gratton, L., & Truss, C. (2003). Three-dimensional people strategy: putting human resource policies into action. *Academy of Management Executive*, 17, (3), 74 – 86.
- Guzzo, R.A., & Noonan, K.A. (1994). Human resource practices as communications and the psychological contract. *Human Resource Management*, 33, 447 – 462.
- Haines, V., & Petit, A. (1997). Conditions for successful human resource information systems. *Human Resource Management*, 36, (2), 261 – 275.
- Hall, L., & Torrington, D. (1998). *The Human Resource Function: the Dynamics of Change and Development*. London: FT Pitman.
- Harel, G.H., Tzafrir, S.S., & Baruch, Y. (2003). Achieving organizational effectiveness through promotion of women into managerial positions: HRM practice focus. *The International Journal of Human Resource Management*, 14, (2), 247 – 263.
- Hope Hailey, V., Farndale, E., Truss, C. (2005). The HR department's role in organizational performance. *Human Resource Management Journal*, 15, (3), 49 – 66.
- Huselid, M. (1995). The impact of human resource management practices on turnover, productivity, and corporate financial performance. *Academy of Management Journal*, 38, 635 – 672.
- Huselid, M., Jackson, S., & Schuler, R. (1997). Technical and strategic human resource management effectiveness as determinants of HRM performance. *Academy of Management Journal*, 40, (1), 171 – 188.
- Igbaria, M., & Tan, M. (1997). The consequences of the information technology acceptance on subsequent individual performance. *Information & Management*, 32, 113 – 121.
- Kane, B., Crawford, J., & Grant, D. (1999). Barriers to effective HRM. *International Journal of Manpower*, 20, (8), 494 – 515.
- Kavanagh, M.J., Gueutal, H.G., & Tannenbaum, S.I. (1990). *Human Resource Information Systems: Development and Application*. PWS-KENT Publishing Company: Boston.
- Keebler, T.J., & Rhodes, D.W. (2002). E-HR: Becoming the “path of least resistance”. *Employment Relations Today*, Summer 2002, 57 – 66.
- Klein, K. J., & Sorra, J.S. (1996). The challenge of innovation implementation. *Academy of Management Review*, 21, 1055 – 1080.
- Lado, A.A., & Wilson, M.C. (1994). Human resource systems and sustained competitive advantage: A competency-based perspective. *Academy of Management Review*, 19, 699 – 727.
- Lepak, D.P., & Snell, S.A. (1998). Virtual HR: strategic human resource management in the 21st century. *Human Resource Management Review*, 8, (3), 215 – 234.
- Lawler, E.E., & Mohrman, S.A. (2003). HR as a strategic partner: What does it take to make it happen? *Human Resource Planning*, 26, 15 – 29.
- MacDuffie, J.P. (1995). Human resource bundles and manufacturing performance: organisational logic and flexible production systems in the world auto industry. *Industrial & Labor Relations Review*, 48, 197 – 221.
- NVP 2004 / e-HRM on-line enquete <http://www.nvp-plaza.nl/e-hrm/e-hrmresults1.html>
- Ostroff, C., & Schimtt, N. (1993). Configurations of organisational effectiveness and efficiency. *Academy of Management Journal*, 36, 1345 – 1361.
- Ostroff, C. & Bowen, D.E. (2000). Moving HR to a higher level. HR practices and organisational effectiveness. In: K.J. Klein and S.W.J. Kozlowski (Eds.), *Multilevel theory, research, and methods in organisations* (pp. 211 – 266). Jossey-Bass: San-Francisco.
- Park, H.J., Mitsuhashi, H., Fey, C.F., & Björkman, I. (2003). The effect of human resource management practices on Japanese MNS subsidiary performance: a partial mediating model. *The International Journal of Human Resource Management*, 14, (8), 1391 – 1406.
- Paul, A.K., & Anantharaman, R.N. (2003). Impact of people management practices on organizational performance: analysis of a causal model. *The International Human Resource Management*, 14, (7), 1246 – 1266.
- Pfeffer, J. (1998). *The Human Equation: Building Profits by Putting People First*. Boston MA: Harvard Business School.
- Roehling, M.V., Boswell, W.R., Caligiuri, P., Feldman, D., Graham, M.E., Guthrie, J.P., Morishima, M., & Tansky, J.W. (2005). The future of HR management: research needs and directions. *Human Resource Management*, 44, (2), 207 – 212.

- Ruël, H.J.M., Bondarouk, T.V., & Looise, J.C. (2004). *E-HRM: innovation or irritation. An exploration of web-based Human Resource Management in large companies*. Lemma Publishers: Utrecht.
- Ruta, C.D. (2005). The application of change management theory to the HR portal implementation in subsidiaries of multinational corporations, *Human Resource Management*, 44, (1), 35 – 53.
- Schuler, R.S., & Jackson, S.E. (1987). Linking competitive strategies with human resource management practices, *The Academy of Management Executive*, 1, (3), 207 – 219.
- Stanton, J.M., & Coovert, M.D. (2004). Turbulent waters: the intersection of information technology and human resources, *Human Resource Management*, 43, (2), 121- 126.
- Taylor, W.A. (2004). Computer-mediated knowledge sharing and individual user differences: an exploratory study. *European Journal of Information Systems*, 13, 52 – 64.
- Thaler-Carter, R.E. (1998). The HRIS in small companies: tips for weighting the options, *HR Magazine*, 43, (8), 30 – 35.
- Tsui, A.S., Pearce, J.L., Porter, L.W., & Tripoli, A.M. (1997). Alternative approaches to employee-organisation relationship: Does investment in employees pay off? *Academy of Management Journal*, 40, 1089 – 1121.
- Tsui, A., & Wang, D. (2002). Employment relationships from the employer's perspective: current research and future directions, *International Review of Industrial and Organisational Psychology*, 17, 77 – 114.
- Vencatesh, V., Morris, M.G., Davis, G.B., Davis, F.D. (2003). User acceptance of information technology: toward a unified view, *MIS Quarterly*, 27, (3), 425 – 478.
- Voerman, M., & Veldhoven, M. Van. De attitude van werknemers ten aanzien van E-HRM verklaard. Een empirische studie bij Philips. *Tijdschrift voor HRM*, forthcoming.
- Wright, P.M., & Dyer, L. (2000). People in e-business: new challenges, new solutions. *Working paper 00-11*, Center for Advanced Human Resource Studies, Cornell University.
- Wright, P.M., McMahan, G.C., Snell, S.A., & Gerhart, B. (2001). Comparing line and HR executives' perceptions of HR effectiveness: services, roles, and contributions, *Human Resource Management*, 40, (2), 111 – 123.
- Wright, P., Gardner, T.M., Moynihan, L.M., & Allen, M. (2005). The relationship between HR practices and firm performance: examining causal order, *Personnel Psychology*, 58, 409 – 446.
- Youndt, M.A., Snell, S.A., & Lepak, D.P. (1996). Human resource management, manufacturing strategy, and firm performance, *Academy of Management Journal*, 39, 836 – 866.

APPENDICES:

Correlations

		EASE	QUAL	JOBRELEV
THRMEFF	Pearson Correlation	,216(*)	,381(**)	,167
	Sig. (2-tailed)	,031	,000	,098
	N	100	100	100
STRATHR	Pearson Correlation	,418(**)	,499(**)	,392(**)
	Sig. (2-tailed)	,000	,000	,000
	N	100	100	100

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 1: Correlation matrix

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,536(a)	,287	,265	,52444

a Predictors: (Constant), JOBRELEV, QUAL, EASE

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1,206	,294		4,107	,000
	EASE	,103	,109	,110	,943	,348
	QUAL	,305	,102	,346	3,000	,003
	JOBRELEV	,133	,078	,174	1,705	,091

a Dependent Variable: STRATHR

Table 2: results of regression analysis 1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,383(a)	,147	,120	,49671

a Predictors: (Constant), JOBRELEV, QUAL, EASE

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2,494	,278		8,969	,000
	EASE	-,037	,103	-,046	-,359	,720
	QUAL	,316	,096	,414	3,281	,001
	JOBREL	-,004	,074	-,006	-,054	,957
	EV					

a. Dependent Variable: THRMEFF

Table 3: Results of regression analysis 1