



# The contribution of e-HRM to HRM effectiveness

## Results from a quantitative study in a Dutch Ministry

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### Abstract

**Purpose** – Both for-profit and not-for-profit organisations have been replacing face-to-face HRM activities with web-based HRM tools, e-HRM for short, for employees and managers since the 1990s. This paper aims to look at whether this is of benefit to an organisation.

**Design/methodology/approach** – The study was conducted in the Ministry of Internal Affairs in The Netherlands, where e-HRM in the form of employee self-service applications was introduced.

**Findings** – The study shows that individual assessment of e-HRM applications influences HRM technical and strategic effectiveness. This is especially so in the perceived quality of the content and the structure of e-HRM applications which have a significant and positive effect on technical and strategic HRM effectiveness.

**Research limitations/implications** – It is difficult to form generalizations from the research into only one company.

**Practical implications** – The basic expectations are that using e-HRM will decrease costs, will improve the HR service level and will give the HR department space to become a strategic partner. This study investigates whether this is the case.

**Originality/value** – The area on which this study concentrates has not had extensive academic research conducted into it.

**Keywords** Human resource management, Worldwide web, Computer based learning, The Netherlands

**Paper type** Research paper

### Introduction

E-HRM, the use of web-based technologies for human resource management practices and policies, is maturing within organisational life. Much is claimed and expressed about the advantages of e-HRM, but scientific proof of these advantages is scarce. There is no clear evidence to answer the question as to whether e-HRM contributes to HRM effectiveness. Consultancy firms, rather than academics, have been behind the first attempts to investigate whether the efforts put into e-HRM lead to the expected outcomes, but these assessments tend to have a non-objective air. The involvement of academia in this topic is more recent and has not yet led to serious answers. The topic



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of e-HRM is certainly not becoming obsolete, and its full potential is still anticipated, and therefore academic involvement in the topic needs to grow.

In this article, we present the results of a quantitative study on the question whether e-HRM contributes to HRM effectiveness. For this purpose, we measured the assessment of e-HRM applications, defined as the extent to which e-HRM applications are perceived as appropriate for their use, and the extent to which employees perceived the resulting HRM to be effective, using a stratified sample. This was carried out in a large governmental organisation: the Dutch Ministry of Internal Affairs. The article is structured as follows: first we summarise developments in research on e-HRM and on HRM effectiveness, and then we focus on our specific line of reasoning, present the research model and describe the research method. This is followed by the presentation of the results. The article finishes with conclusions and discussion.

### **Developments in research on e-HRM**

Academic involvement in e-HRM started relatively late and, to an extent, is still trying to catch up with practice. The special issue of Human Resource Management on this topic in the summer of 2005 was timely. It outlined the state-of-the-art in the overlap between information technology and human resource management: four of the nine articles were theoretical developments oriented towards specific (e-) HRM sub-fields, and three articles presented empirical evidence related to e-HRM sub-fields (two quantitative and one qualitative). The literature on e-HRM is growing, including a book edited by Gueutal and Stone (2005) in which, mainly American, scholars present a good overview of e-HRM research to date, and try to bridge the gap with e-HRM practice. Despite these signs of a growing literature base, research on e-HRM is still in its “youth-phase”. Researchers are still searching for relevant and adequate theory that can fully grasp the concept of e-HRM, and frequently present fragmented empirical evidence, particularly on e-HRM sub-fields such as e-recruitment and e-learning, the so-called “early bird” areas where web technology was first adopted. Empirical research that treats e-HRM as a complete approach for “doing HRM” through implementing business resource planning software, as in Peoplesoft and SAP HR, is still in its infancy. Consequently, in this article, we try to contribute to advancing e-HRM research.

We define e-HRM as a way of implementing HRM strategies, policies and practices in organisations through a conscious and directed support of, and/or with the full use of, web-technology-based channels. The word “implementing” in this context has a broad meaning, such as making something work, putting something into practice, or having something realised. E-HRM, therefore, is a concept – a way of “doing” HRM (Ruël *et al.*, 2002, 2004). This is not to ignore the fact that e-HRM can transform the nature of HRM strategies, policies and practices, as is suggested by the model of Ruël *et al.* (2002, 2004). This is seen as a consequence that emerges over time and which is difficult to manage. However, although we would not disagree that this is a very relevant topic for research, it is simply beyond the scope of this article to consider how e-HRM is conceptualised.

The current e-HRM literature distinguishes three types of e-HRM: operational e-HRM, relational e-HRM and transformational e-HRM. These distinctions are based upon the work of Lepak and Snell (1998) who distinguished operational HRM, relational HRM and transformational HRM, and of Wright and Dyer (2000) who

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distinguished transactional, traditional and transformational HRM. Within all the types of HRM, choices have to be made in terms of which HRM activities will be offered face-to-face, and which will be offered through web-based HR (i.e. e-enabled). For the operational type of HRM, this issue amounts to a choice between asking employees to keep their own personal data up-to-date through an HR web site or to have an administrative force in place to do this for them. In terms of relational HRM, there is a 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 use paper-based materials.

The literature on e-HRM suggests that, overall, the three goals of e-HRM are cost reduction, improving HR services, and improving strategic orientation (Brockbank, 1997; Lepak and Snell, 1998; Ruël *et al.*, 2004; Stanton and Coovert, 2004). Some of the empirical findings add globalisation to these goals, seeing it as an e-HRM driving force in large international organisations. However, the findings also show that these goals are not clearly defined in practice, and that e-HRM is mostly directed towards cost reductions and efficiency increases in HR services, rather than aiming to improve the strategic orientation of HRM (Gardner *et al.*, 2003; Ruël *et al.* 2004; Ruta, 2005). Recent studies have found that in nearly half of the companies with a fully integrated HRIS, HR was not viewed as a strategic partner. This is despite the observation by Shrivastava *et al.* (2004, p. 201) that "it appears that firms that undertake technology initiatives with a view to enable the HR function to focus more on value-added activities are the ones most likely to realize the full potential of technology".

Ruël *et al.* (2002) noted an aspect that is fairly well covered by the above summary but that is nevertheless interesting to highlight, namely the changing nature of the employment relationship. With the supply shortage in the labour market (during the economic upturn of the 1990s), the individualisation 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 employees: they want to be able to set their own career paths. In the view of Ruël *et al.* (2002) a move towards e-HRM can provide tools to support such a development. This aspect adds to the earlier-mentioned drivers, specifically improving the service offered to internal clients, but has an external societal drive.

Ruël *et al.* (2004) have also shown that although, in practice, the e-HRM types tend to be mixed, establishing a good basis for e-HRM at the operational level seems to be an essential prerequisite for relational and transformational e-HRM; and that this requires changes in the tasks of HR professionals (less paper-based administration, more e-communications with employees, acquiring skills for operating IT). They also emphasised that positioning companies by their e-HRM types does not imply judging them – it is not about better or worse e-HRM types. Further, it was also shown that there is a "gap" between e-HRM in a technical sense (the available functionality) and its use and adoption by employees and line managers. Actual usage/adoption can lag by up to three years what is available.

Other available research evidence suggests that, in many organisations, e-HRM has led to a radical redistribution of the work that HR managers used to do. Many of the

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reporting-type activities, previously performed by HR professionals, can now be performed on-line by managers and employees (Ruël *et al.*, 2004; Ruta, 2005; Martin, 2005). On their own desktops, line managers nowadays perform appraisals, evaluate employee costs, generate HR reports (turnover, absenteeism), process training requests and oversee competence management. Employees have 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).

The literature suggests that the various goals of e-HRM, and the different types of e-HRM, are expected to result in outcomes that include more efficient HRM processes, a higher level of service delivery and a better strategic contribution. Such expected outcomes can be “encapsulated” in one concept: HRM effectiveness. E-HRM, at the end of the day, is expected to contribute to the effectiveness of HRM, which in turn should contribute to achieving an organisation’s goals.

### **HRM effectiveness**

HRM effectiveness is addressed in a great number of studies that strive to demonstrate the value of what HR professionals do for the rest of the organisation, and how HRM practices are linked to desired organisational outcomes (Huselid, 1995; Boxall, 1996; Baron and Kreps, 1999; Wright *et al.*, 2001). Following Wright *et al.* (2001), we note that attempts to demonstrate HRM effectiveness have focused on a limited number of areas.

HRM effectiveness is often mentioned as HRM’s contribution to a firm’s performance (see for example, Kane *et al.*, 1999; Ostroff and Bowen, 2000; Wright *et al.*, 2001). Especially within the last ten years, the HRM literature has attempted to show that progressive HR practices result in enhanced firm performance (Wright *et al.*, 2005; Hope Hailey, 2005). Huselid’s (1995) pioneering study showed that a set of HR practices, labelled High Performance Work Systems, were positively related to turnover, accounting profits and a firm’s market value. Since then, a growing number of studies have attempted to empirically test the relationships between HR practices and firm performance (see the overviews by Delery and Doty, 1996; Ostroff and Bowen, 2000; Boselie *et al.*, 2001; Wright *et al.*, 2005).

#### *Technical and strategic effectiveness of HRM*

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

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

Nowadays, despite becoming increasingly confronted with electronic HRM, we would note that we are still left to wonder to what extent the use of e-HRM makes HRM more effective overall. Or in other words, if an organisation decides to introduce computerised HRM, will e-HRM processes have the desired impact on employees' skills, behaviour and attitudes and, further, what conditions does e-HRM have to meet in order for it to contribute to strategic and technical HRM effectiveness?

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#### *The research model*

In this study, we will test one main hypothesis: that the assessment of e-HRM applications determines their contribution to strategic and technical HRM effectiveness. In addition to this main hypothesis, we will investigate which factors affect the assessment of e-HRM applications. The assessment of e-HRM is seen as the extent to which e-HRM applications are perceived as appropriate in use.

Recent studies on the implementation of e-HRM have shifted towards addressing the dynamic nature of HRIS implementation, and have used concepts such as innovation implementation, learning, change management and the Technology Acceptance Model (Keebler and Rhodes, 2002). The incorporation of the Technology Acceptance Model (Davis *et al.*, 1989) into e-HRM studies has resulted in the idea that the use of e-HRM by the targeted employees is largely determined by the level of usefulness of the HR information technology and the ease of its use (Ruta, 2005; Voermans and Van Veldhoven, 2005). A good recent example is the study into the implementation of an HR employee portal in the Italian subsidiary of Hewlett-Packard (Ruta, 2005).

Inspired by concepts of the Technology Acceptance Model, usefulness and ease of use, we distinguish three aspects of e-HRM assessment: its job relevance (slightly different from usefulness), its quality and its ease of use. In particular we have included quality, referring to the content (HRM policies and practices) and the structure of the e-HRM tools.

From the literature on IT implementation, it is known that the participation and involvement of future users of information technologies in the design and implementation stages affects their later adoption of these technologies (see for example: Barki and Hartwick, 1994; Lin and Shao, 2000; Hunton and Beeler, 1997). We assume that this will also be the case with e-HRM implementation, and it will be interesting to find out to what extent participation and involvement aspects especially affect the assessment of e-HRM. The findings will be of use for planning future practical implementations and for future research on e-HRM implementation and change management.

We have assembled our ideas into a visual model as shown in Figure 1.

Based on this model, we draw a more specific hypothesis:

- H1.* The assessment of e-HRM, and more specifically the job relevance, quality and ease of use of e-HRM tools, positively affects technical and strategic HRM effectiveness.

### **Research methodology**

#### *Measures*

In this article we present the results of a quantitative study. The study aimed at answering the central question: does the assessment of e-HRM affect HRM

effectiveness? We aimed at statistical generalisation given that we could only take a limited sample (Yin, 1994), in other words we hoped to determine whether there was any basis for assuming a positive relationship between the assessment of e-HRM and HRM effectiveness across the population as a whole. We saw our study as only a first, tentative, step in gaining a fuller understanding of this relationship.

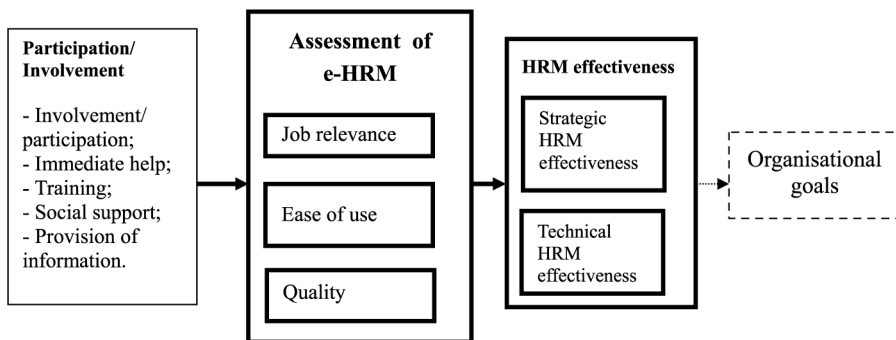
*The research site: The Dutch Ministry of Internal Affairs.* The study was based on data collected through a questionnaire administered on-line in a large governmental body, the Dutch Ministry of Internal Affairs. In 2002, this ministry had begun to introduce operational e-HRM (employee and management self-service for basic HRM practices) in a scheme called Emplaza. The ministry aimed to build on this and move towards more advanced e-HRM in the future.

The questionnaire operationalised aspects of e-HRM assessment (job relevance/usefulness, quality of the applications, and ease of use), HRM effectiveness (strategic HRM effectiveness, and technical HRM effectiveness) and participation/involvement (see Table I). We developed five-point scales with which every item could be “scored” as follows: 1 = fully disagree, 2 = disagree, 3 = partly agree, partly disagree, 4 = agree, 5 = fully agree.

Job relevance was operationalised using four items (example item: “The use of [the name of the e-HRM application] enhances my productivity”), ease-of-use was operationalised with five items (example item: “I find [the name of the e-HRM application] easy to use”). Turning to the quality of the e-HRM application we focused on the content functionality and the structure, and consequently developed five items (example item: “I like the content of [the name of the e-HRM application]”).

The operationalisation of technical HRM effectiveness focused on work conditions and communications, and we turned these into five items (example: “Within the ministry, the communications between management and subordinates are sufficient”). Strategic HRM effectiveness focused on commitment, competence development and change and these were covered by six items (example item: “Within the ministry there is a sufficient number of initiatives to commit employees”).

The operationalisation of participation/involvement focused on five aspects: participation in development and implementation (example item: “I was given sufficient opportunities to participate in the initial implementation”), immediate help (example item: “I could always express my questions and remarks about [the name of



**Figure 1.**  
Research model: the link between e-HRM and HRM effectiveness



Aspects	Definition	Scale consistency
Job relevance (four items)	The extent to which users believe that using an e-HRM tool is critical in their work situation	0.81
Ease of use (five items)	The extent to which a user of an e-HRM application finds the application straightforward in its operation and interactions	0.84
Quality (five items)	The extent to which a user finds the application well designed and well set up in its HR content	0.83
Technical HRM effectiveness (five items)	How well the operational HR activities are performed	0.79
Strategic HRM effectiveness (six items)	How well employee behaviours that support organisational needs in the long run are promoted	0.64
Participation (four items)	The extent to which users participate in the development and implementation of the e-HRM applications	0.90
Immediate help (two items)	The extent to which users can get immediate help and support while using the e-HRM applications	0.52
Social support (two items)	The extent to which users are supported by colleagues and managers in using the e-HRM applications	0.71
Training (two items)	The extent to which users can participate in organised instructional sessions for learning to use the e-HRM applications	0.83
Provision of information (three items)	The extent to which users are provided with information and communications about the e-HRM applications	0.90

**Table I.**  
Definitions and the scales' internal consistencies (Cronbach's alpha)

the e-HRM application]), social support (from colleagues and managers) (example item: "My manager encourages me to use [the name of the e-HRM application]", training (example item: "A sufficient number of training sessions were offered to learn to work with [the name of the e-HRM application]", and the provision of information (example item: "There is a sufficient level of information provision about [the name of the e-HRM application]").

From the total population we selected a smaller stratified sample in order not to "exhaust" all the employees with yet another invitation to complete a questionnaire. We pre-selected respondents so as to cover all age categories, both sexes, all grades and all units; and we were especially careful to ensure that a sizable number of managers would be involved. In total, we selected 277 members of the organisation of which 186 were operational employees, 47 managers and 44 HR professionals. They all received an e-mail invitation to participate in our study, and they could click on a hyperlink to access the questionnaire. The response rate was 36 per cent – that is we had exactly one hundred respondents: 54 men and 46 women. The electronic tool used in developing the questionnaire did not allow respondents to leave questions unanswered, and so there were no missing values to contend with. For testing the formulated hypothesis we used regression analysis.

**Results**

The hypothesis to be tested was:

- H2. The assessment of e-HRM, and more specifically the job relevance, quality and ease of use of e-HRM tools, positively affects technical and strategic HRM effectiveness.

The outcome of the data analysis showed, surprisingly, that only the quality aspect of the e-HRM application had significant, positive effects on strategic HRM effectiveness ( $\beta = 0.35$ ;  $p = 0.003$ ;  $n = 100$ ) (see Table II) and on technical HRM effectiveness ( $\beta = 0.41$ ;  $p = 0.001$ ;  $n = 100$ ) (see Table III). This means that how employees and managers judge the content and design of the e-HRM application determines (at least statistically) the extent to which they perceive the HRM to be technically and strategically effective. When employees are more positive about the content and the structure of an e-HRM application, they tend to see an increase in technical and strategic HRM effectiveness.

That the other two aspects, job relevance and ease of use, did not have a significant effect on HRM effectiveness surprised us since these two aspects have been shown to be important determinants in case studies on IT implementation and the acceptance of new IT systems by users. Confronted with this result, we sought an alternative explanation: we now believe that the job relevance and ease of use aspects are necessary preconditions in the event of new system implementation, but are not associated by employees and managers with improvements in HRM effectiveness following e-HRM implementation. In such a situation, the quality of the e-HRM

	Non-standardised coefficients		Coefficients matrix Standardised coefficients		t	Sig.	Adjusted R square
	B	Std error	Beta				
	(Constant)	2.494	0.278				
Ease of use	-0.037	0.103	-0.046		-0.359	0.720	
Quality	0.316	0.096	0.414		3.281	0.001	
Job relevance	-0.004	0.074	-0.006		-0.054	0.957	

**Note:** Dependent variable: technical HRM effectiveness

**Table II.**  
Results of regression analysis: assessment of e-HRM applications and technical HRM effectiveness

	Non-standardised coefficients		Coefficients matrix Standardised coefficients		t	Sig.	Adjusted R square
	B	Std error	Beta				
	(Constant)	1.206	0.294				
Ease of use	0.103	0.109	0.110		0.943	0.348	
Quality	0.305	0.102	0.346		3.000	0.003	
Job relevance	0.133	0.078	0.174		1.705	0.091	

**Note:** Dependent variable: technical HRM effectiveness

**Table III.**  
Results of regression analysis: assessment of e-HRM applications and strategic HRM effectiveness



application, in terms of its content and design, seems to be the critical determining aspect.

*Factors affecting e-HRM evaluation*

Having found that only the quality of the e-HRM application was positively related to technical and strategic HRM effectiveness, we conducted a follow-up analysis to determine which factors affect the assessment of e-HRM quality. Again using regression analysis, the results showed that social support by colleagues and managers ( $\beta = 0.30, p = 0.001, n = 100$ ) and the users' judgments of the information provided about the e-HRM applications ( $\beta = 0.36, p = 0.001, n = 100$ ) were the only significant statistical predictors of the extent to which users value the content and design of e-HRM applications (see also Table IV). In other words, greater social support from colleagues and managers and better information provision leads to a greater appreciation of the content and design of e-HRM applications.

**Conclusions and discussion**

In this article, the central hypothesis was that e-HRM contributes to HRM effectiveness. In order to test this, we evaluated the results of a quantitative study on this topic. In this way, we aimed to take a first tentative step towards collecting a broader base of evidence to support or refute this assertion.

The results show that one's assessment of the quality of e-HRM applications in particular is positively related with technical and strategic HRM effectiveness. An increase in the perceived quality of an e-HRM application results in an increase in HRM effectiveness.

Interestingly, the job relevance and ease of use of e-HRM applications do not seem to have a significant positive effect on strategic and technical HRM effectiveness. Surprisingly, users do not link the relevance of the e-HRM applications for their job, or their ease of use, with HRM effectiveness. This does not mean that job relevance and ease of use are not important in the event of implementing new information technology (and this has been proven by a number of studies on the topic), but rather that these are not important determinants of HRM effectiveness when using e-HRM.

Further analyses show that, of the number of aspects of participation and involvement in development and implementation considered, only the level of social support (from colleagues and managers) and the level of information provided on the

**Table IV.**  
Results of regression analysis: participation/involvement – assessment of quality of e-HRM applications

	Coefficients matrix						
	Non-standardised coefficients		Standardised coefficients		t	Sig.	Adjusted R square
	B	Std error	Beta				
(Constant)	1.203	0.266			4.521	0.000	0.377
Participation	0.155	0.084	0.204		1.848	0.068	
Immediate help	0.054	0.086	0.066		0.629	0.531	
Social support	0.242	0.068	0.298		3.574	0.001	
Training	-0.055	0.093	-0.073		-0.591	0.556	
Provision of information	0.301	0.092	0.361		3.271	0.001	

**Note:** Dependent variable: evaluation of quality of e-HRM applications

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e-HRM applications significantly affect the assessment of the quality of the e-HRM applications. Good support from colleagues and managers and better information provision leads to a more positive assessment of the quality (content and design) of e-HRM applications.

This is very clearly a useful outcome for the many HR practitioners dealing with e-HRM implementation. However, it is somewhat surprising that the extent to which employees and managers participate in the development and implementation phases does not seem to affect assessment of the quality. As noted earlier, from a broad range of literature sources, it is known that these factors positively influence IT adoption. It is beyond the scope of this article to delve deeper into this, but it warrants further attention in future e-HRM research. Overall, this study has provided some specific answers as to what aspects of e-HRM applications are most important in determining HRM effectiveness.

### *Limitations*

Although this research aimed at providing empirical evidence for the hypothesis that e-HRM contributes to HRM effectiveness by presenting results from a quantitative study, there are, of course, limitations to any study. First of all, this study was carried out in only one organisation, and that within the public sector. One should thus be very cautious in generalising the results, although we do believe that it is not unreasonable to make a theoretical generalisation. However, statistical generalisations should be made with extreme care. Further studies on this topic in other contexts are clearly desirable.

Another limitation with our overall study is that we did not include context variables in our research model. For example, the characteristics of the implementation project and the personal characteristics of the respondents (sex, age, computer experience, job type, etc.) were ignored. It seems reasonable to assume that such variables do have an impact on the relationship between e-HRM and HRM effectiveness and, therefore, future studies should consider expanding the research model to take these aspects into account.

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