Where the light is

A review of the literature on factors and consequences of e-HRM success and a contingency framework

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UNIVERSITY OF TWENTE.

Master thesis

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Cover image: "Where the light is". Shot by: Ferry de Wit. Location: Chiang Mai, Thailand

To Maria, Enrico and Damy

For their tolerance and endurance

Management summary

Background

This research was conducted on behalf of Mitopics and the University of Twente.

Purpose

The first goal of our research was to provide an answer to the question of what factors were reported to affect e-HRM success and to illustrate which consequences of e-HRM were empirically found in four decades of e-HRM literature . Second, by reviewing all relevant literature regarding e-HRM and assembling all investigated factors and consequences we intended to synthesize findings from a field that was traditionally scattered throughout distinct research disciplines. Third, by means of our literature review and synthesis of findings we aimed at developing a contingency framework which could be used by practitioners to investigate the chances of e-HRM success and by scholars as a starting point for future research.

Method

By means of a systematic bibliographical search of leading databases (Scopus, Web of Science) we compiled a preliminary literature list. We then scanned the articles for relevance and quality and filtered out articles that did not match our criteria. Finally, for reviewing purposes and to construct our framework, we only focused on empirical findings. Data was collected by reading articles, marking factors and consequences and annotating them in the margin. Next, the factors and consequences were inserted in software for creating mind maps. Raw mind maps were used for categorizing similar factors and consequences together. By doing this categories of factors and consequences inductively emerged from the data.

Results

First, we found that literature on e-HRM can be divided into two salient research streams, namely: research on factors affecting e-HRM adoption and research on factors affecting e-HRM consequences. The majority of articles can be classified in the former stream. Second, factors were found in four distinct categories: technology factors, organizational factors, people factors and environmental factors. Consequences were found in the form of organizational and people consequences, whereby organizational consequences could be further divided in operational, relational and transformational consequences. Third, although all factor-categories were represented in each decade, the amount of people factors grew with time, indicating an increased awareness of the essential role these factors play in successful e-HRM. Also, as time passed, we found increasing evidence for transformational consequences of e-HRM.

Conclusion

Our main conclusion after the analysis of our sample is that though research on e-HRM has progressed since the beginnings in 1970, numerous research gaps remain. This provides a great number of avenues for future research. Also, promises of e-HRM are increasingly being met in practice. However, specific factors need to be considered in order to reach these results. These factors can be divided into factors affecting adoption and factors

affecting consequences. When organizations are aware of both types and take steps, when necessary, to positively influence both types, they will increase the chance of reaching aimed goals. Unfortunately, since the e-HRM research field is far from being mature, more research is needed in order to fully understand the importance of certain factors, the specific effects they have and the way these factors interact.

Preface

'Man stands for long time with mouth open before roast duck flies in' (Chinese proverb)

Before I started with this thesis it seemed a little too ambitious and even a bridge too far for me. I didn't know what e-HRM exactly was, I didn't know how to conduct a literature review and I had never written a paper of this size and this level in English. How in the world was I going to review four decades of scientific literature on e-HRM and even build a practical tool for experts from my findings? It was like asking a dog to learn a bird how to fly..

Of course, once I started, I began to see the bigger picture and things became clearer and clearer. But there were numerous moments where I couldn't find any signs of light and obstacles seemed insurmountable.

One of the most important lessons I've learned during this project came from Rik. He told me that when you're stuck and have absolutely no idea which way to go, the key is to *start somewhere, anywhere*. It also became even clearer to me that big success is comprised of all kinds of very little successes and that it is all up to you to grab the opportunity and create these successes. Instead of waiting for a roasted duck to fly into my mouth, I decided to roast the duck myself.

Thus, by conducting this research I not only shed light on important factors for e-HRM success, but also on important factors for my own personal success.

However, without the help, support and effort of my supervisors Tanya, Elfi, Rik and Janneke I wouldn't have finished the thesis in its current form. Thank you!

I also want to thank my family and others close to me. Your support and motivation throughout my studying years helped me reach the finish line.

Attached to this thesis are some Appendices including additional work I've done based on my research findings. Namely, two articles written for journals and a tool I've built for practitioners. Since these appendices are not a part of this thesis, I've called them 'Extra appendix A', 'Extra appendix B' and 'Extra appendix C'. The tool is attached as an image instead of its original spreadsheet format.

Now hurry up, it's still hot…

Enjoy your roasted duck!

Ferry

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1. Introduction

E-HRM has been subject to research for almost four decades, witnessing its birth in an article by Mayer (1971) on Electronic Data Processing Personnel Systems. It has recently been defined by Strohmeier (2007) as:

'the (planning, implementation and) application of information technology for both networking and supporting at least two individual or collective actors in their shared performing of HR activities' (Strohmeier, 2007, p. 20)

The adoption of e-HRM within organizations is becoming increasingly common (Elliot & Tevavichulada, 1999; Chapman & Webster, 2003). Clearly, this growing adoption is a result of the increasing usage of the internet in general and for electronic human resource management duties. Further, organizations' expectations of positive consequences of e-HRM (Strohmeier, 2009) motivate organizations increasing usage of digital systems. Also, academic research is increasingly conducted in this field. Traditionally, e-HRM is seen as providing three benefits for organizations: cost reduction, improvement of services, and reorientation of HR professional to be more strategic (Ruël et al, 2004). Concerning consequences of e-HRM the literature differentiates between operational, relational and transformational consequences (Lepak & Snell, 1998; Reddick, 2009). Operational consequences have been defined as efficiency and effectiveness gains as well as cost savings. Relational consequences were found in the form of improvements of service towards internal and external HR clients, whereas the HR department is becoming more involved in strategic planning and execution is defined as a transformational consequence of e-HRM implementations (Ruël et al, 2004; Strohmeier, 2007; Reddick, 2009; Martin & Reddington, 2010).

For the last three decades the body of knowledge on e-HRM has been growing extensively and it has distinguished itself as a unique research area. But why is it important to consider research on e-HRM as distinct from research on information systems in general? We distinguish four potential reasons: the reach, the information type stored in e-HRM systems, the uniqueness of consequences of such a system and the fact that the business case is mostly not built on obliged usage. First, concerning reach, e-HRM has the potential to impact all organizational members since mostly every employee in an organization has to register its data into the system. Second, the information type stored in e-HRM systems concerns sensitive personnel data. When organizations do not use this data in a safe and confidential manner, it can have serious legal consequences. Third, as mentioned above, e-HRM has the potential to enhance the service of the HR-department and can even transform this department towards a more strategic orientation, which both are a heavy impact on the way HR professionals were used to doing their jobs. These consequences are specific to e-HRM. Fourth, the HR-department is often seen as a supporting department which is not considered a part of the primary process of an organization. Thus, the business case for organizations to consider implementing such a system is, in some cases, not built upon an essential need for the survival of the business. This means that it is mostly harder to gain support, especially from top management. Motivation for implementing a system is even further decreased by the fact that it is not easy to reach aimed goals and there is not much empirical evidence to support achievement of goals.

Despite the conducted research and the available knowledge in science and practice, some personnel departments in organizations still experience difficulties and e-HRM results are not always as positive as assumed. To put it differently: e-HRM projects even report failures (e.g. Tansley et al., 2001; Smale & Heikkilä, 2009; Martin & Reddington, 2010), and were found to achieve less than what was expected of the e-HRM implementation (Chapman & Webster, 2003). Although results seem to improve a little (e.g. Bondarouk & Ruël, 2007), the previous shows that organizations are not fully aware of the critical factors that lead either to success or failure. To make things more complicated: studies on the factors influencing e-HRM success tend to report overlapping, but also contradictory results.

For instance, some authors report that user involvement during development and implementation is of great importance for success (Kossek et al., 1994) while others do not find strong support (Haines & Petit, 1997). While the size of an organization was found to be insignificant by some authors (Haines & Petit, 1997; Hussain et al., 2007), others describe it as a determinant factor (Ball, 2001; Haines & Lafleur, 2008; Strohmeier & Kabst, 2009). The same holds for the importance of training for success: evidence in favor of this factor is present (Alleyne et al., 2007; Panayotopoulou et al., 2007; Martin & Reddington, 2010), as well as evidence against it (Ruël et al., 2007). Some research suggests that HR professionals should increase their technical knowledge and skills in order for an e-HRM implementation to succeed (Hempel, 2004), yet other findings show just the opposite (Ball et al., 2006).

Until now, no clear and comprehensive overview was given on why contradictions in research exist and which factors are assumed to impact versus which factors have been empirically proven to impact e-HRM implementations. Accordingly, we try to fill this gap by conducting an explorative systematic literature analysis, covering four decades of e-HRM research. By means of this review, we address the following research question:

'What are the factors affecting the success of e-HRM as found in four decades of e-HRM research literature?'

Our focus lies on studying integrative consequences of deploying e-HRM in organizations (Bondarouk & Ruël, 2009) and on identifying the factors that lead to certain consequences. A comprehensive literature review is conducted to synthesize the body of knowledge as it is scattered throughout many distinct research disciplines, like for instance information systems, human resource management, psychology and management research.

The most recent findings, as identified in the review, are then used to develop a *contingency framework for e-HRM consequences in organizations*. As mentioned by Strohmeier (2007), the field is lacking a leading paradigm. The framework is a factor-based conceptual model which includes factors and consequences in different scenarios based on antecedents or contingency factors.

The contribution of this study is thus twofold. First, we conduct a systematic literature review to provide a clear overview of the literature concerning factors leading to certain e-HRM consequences. Major influencing factors, as found in four decades of research, will thus be identified. We provide a comprehensive discussion on the contradictions in the literature and enrich the dialogue with its context and our own thoughts. Also, by means of this review we provide a historical overview of developments in the field of e-HRM. Second, on the basis of what we identified in the review, we build a contingency framework which shall serve as a tool for practitioners

and scholars to evaluate the chances of success in e-HRM implementations and to identify which factors to tackle in order to reach a successful implementation. In this way, we try to provide a tentative guide into solving the common pitfalls during implementations. Furthermore, the model can serve as a starting point for future research.

In the next section, the methodology of the literature review is described. Then, a review of the literature concerning factors and consequences is given. Major themes and findings are outlined per decade. Finally, the resulting contingency model is presented.

2. Method

2.1 Literature search

To find relevant literature on e-HRM, we conducted a systematic bibliographical search. Articles that were included in the review needed to have as main focus e-HRM in general while functional areas such as e-recruitment or e-learning were excluded for the review purpose of this study. We restricted the search to relevant disciplines including management, HR and information systems. On the basis of broad search queries like 'e-HRM', 'electronic HRM', 'digital HRM', 'virtual HRM', 'web (based) HRM', 'online HRM', 'HRIS', 'HRIT' and 'Computer Based Human Resource Management' the research databases of ISI Web of Science and Scopus were investigated. Also full words of the abbreviations were used as search terms. *Appendix A* provides an overview of all search terms used and the number of articles found. Our initial search query led to thousands of results from diverse disciplines and used databases yielded some overlap.

By scanning relevant titles and abstracts to determine if an article was related to e-HRM and removing duplicates, we made an initial selection of 299 relevant articles covering a time frame from 1971 until September 2010. Following, article titles, abstracts, journal relations and years published were inserted in a spreadsheet. Three researchers critically examined titles and abstracts for their relevance and value to the literature review by asking the following questions: *'do we expect the articles to describe either factors or consequences of e-HRM?'* , *'what is the quality of the article (frequently cited?) and/or impact of the journal?'*.

The papers were then checked by experts in the field for relevance and quality for inclusion in the literature review, resulting in a preliminary sample of 109 articles. Following, we carefully read the articles and determined whether they presented empirical findings or not, since our review and model is based on factors which were empirically studied. After filtering out non-empirical texts, the final sample comprised 69 articles (*Appendix B*). *Appendix C* provides an overview of used methods and samples in all papers. *Figure 1* summarizes the search procedure.

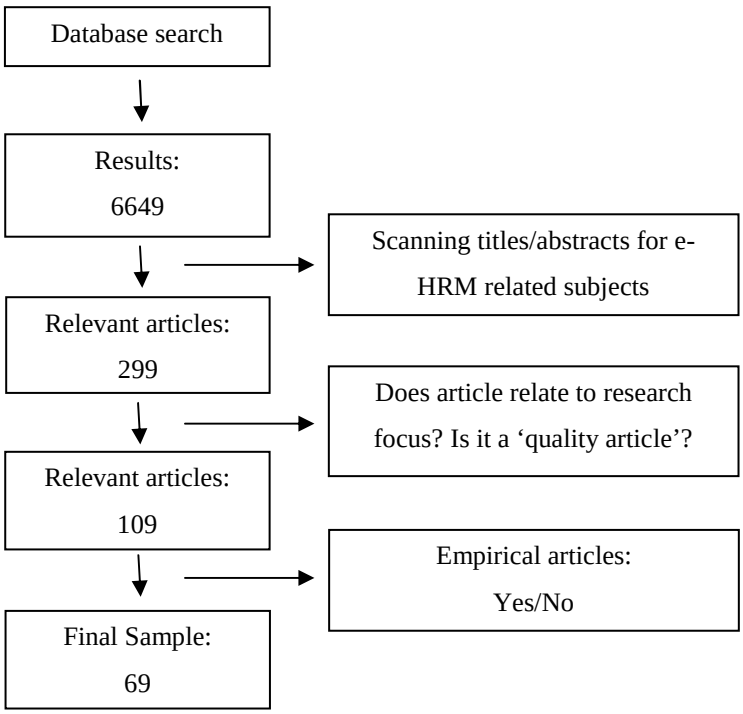

***Figure 1**: Literature search procedure*

From the 69 articles, two articles were from the 70's, four from the 80's, twelve from the 90's and 51 were published after 2000.

2.2 Data collection and analysis

To identify factors and consequences of e-HRM we started our analysis procedure with a variation of open coding. During the open coding process, we read the articles and broke down data analytically (Strauss & Corbin, 1990). We did this in the following way: first, we read the articles and scanned them for relevant factors and consequences. When we found potentially relevant factors and consequences we highlighted them, listed and annotated them in the margin. We then re-read the articles to check if some factors and consequences were overlooked and to determine whether factors and consequences which we highlighted during the first reading were highly relevant. The procedure continued as long as no new factors or consequences emerged.

Next, we categorized factors and consequences under the labels 'factors affecting adoption', 'factors affecting consequences' and 'consequences' in mind maps using Freemind software (freemind.sourceforge.net) . In order to eventually build the conceptual contingency model, we only included factors and consequences which were empirically identified by the authors, thus basing our findings on primary empirical data. We also left out factors and consequences which were cited and derived from other studies in order to minimize bias in including these factors and consequences twice. Our initial coding process led to mind maps with a great number of factors and consequences. *Appendix D* provides an overview of all mind maps of factors affecting adoption, factors affecting consequences and consequences from 1970 - 2010. These mind maps were very useful in supporting our analytical reasoning to identify categories reflecting the various factors and consequences. By freely mapping and connecting factors and consequences to each other the categories inductively emerged from the data. After

the mapping and categorizing was done, we were able to present our findings. In the next section we explain the procedures for deriving categories in more detail and present our definitions.

To keep the rich descriptions provided by the authors, we directly described the factors at the moment of identification. Specifically, we described the research methods, the sample and research setting in which the factors were found in a raw document directly after we finished reading the article. Consequently, we did not risk destroying the meaning of the data through intensive coding (Eisenhardt, 1989) and were able to enrich the findings with their context. *Figure 2* illustrates our coding and analysis procedure we used for each article.

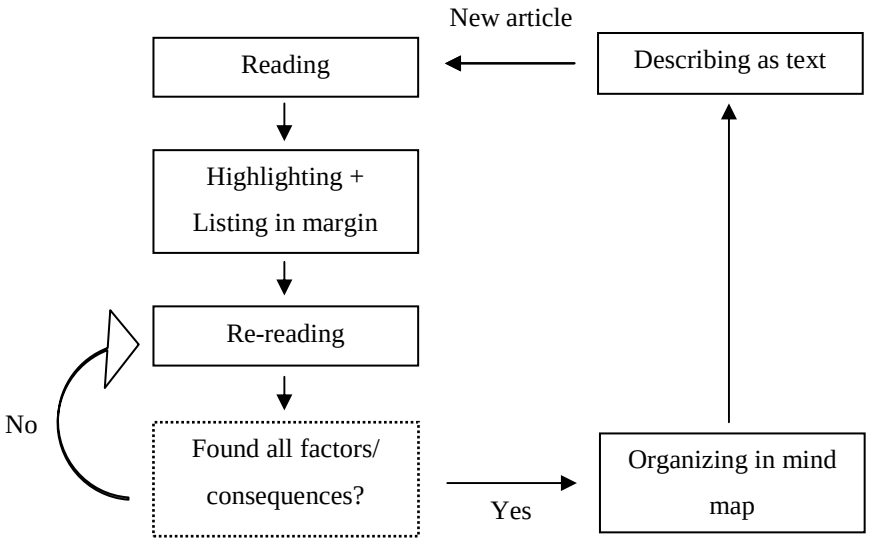

***Figure 2**: Coding and analysis procedure*

2.3 Derivation of categories and definitions

The coding and analysis procedure continued until we carefully examined all articles per decade. Then we used the mind maps and the separate texts and to analyze and present our findings. We were able to map all factors and consequences along four aspects: *technology*, *organizational*, *people* and *environmental*. In total, we found eight categories of factors and four categories of consequences which revealed to be useful for categorizing all decades. The categories and definitions are found in *Table 1*.

Factors appeared to belong to two different research streams *(Figure 3)*, namely factors affecting the *adoption* of HR systems and factors affecting *consequences* of HR system implementations. Adoption and implementation were often used interchangeably and it is therefore important to clarify what we mean by those two terms. Adoption in HR is defined by Strohmeier and Kabst (2009) as

'the process of initiating and implementing IT in order to support diverse actors in performing HR tasks' (Strohmeier & Kabst, 2009, p. 484)

Bondarouk's (2004) definition of implementation describes adoption as the goal of an implementation:

'the adoption of a system during the transition period between the technical installation of a new system and its skillful and task-consistent use by a group of the targeted employees' (Bondarouk, 2004, p. 41).

***Table 1**: Categories of factors and definitions and their definitions*

	Factors affecting adoption	*Factors affecting consequences*	*Consequences of implementation*
Technology	Factors affecting adoption which are related to the new or existing technology	Factors affecting consequences which are related to the new or existing technology	Consequences of implementation impacting an organization's technology
Organizational	'Hard' organizational factors affecting adoption	'Hard' organizational factors affecting consequences	Consequences of implementation impacting the 'hard' side of organizations
People	'Soft' or individual people factors affecting adoption	'Soft' or individual people factors affecting consequences	Consequences of implementation impacting the individuals
Environmental	Environmental factors affecting adoption	Environmental factors affecting consequences	Consequences of implementation impacting the organization's environment

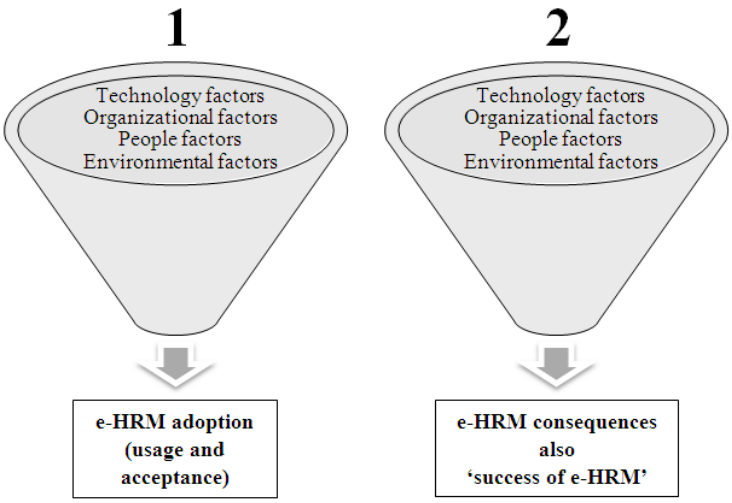

***Figure 3**: Two research streams*

Implementation thus starts with the technical installation, whereas the adoption process starts earlier. In other words, we see implementation as a phase in the adoption process, with implementation preceded by 'initiation', which in our view consists of decision to buy/develop a system, select a system and introduce a system. We find

this plausible since we also identified factors which affect adoption prior to the implementation. The second category refers to factors affecting the consequences of e-HRM implementations, either success or failure, with success being defined as expected or unexpected desired consequences (Strohmeier, 2007). Finally, in line with what was mentioned in the introduction, 'organizational consequences' were found in the form of *operational*, *relational* and *transformational* (Lepak & Snell, 1998; Reddick, 2009). We also identified factors affecting individual people and consequently named this category 'people consequences'.

Furthermore, it is important to note that not all categories directly emerged from the literature in their final form but were constantly relabeled during the reading and coding process. New insights which emerged by reading the articles and fruitful discussions with academics led to a dynamic process whereby factor labels and category labels were constantly altered until they reached their final form. The final factors, consequences and their categories were also checked by e-HRM experts (academics and practitioners) for their relevance and correctness.

Finally, we defined a subcategory of *knowledge and skills* for the 'organizational' and the 'people' category. Although from a practical point of view it might be more logical to map all factors under one category, we could not do this from an analytical perspective. Since our review is concerned with reporting data from other authors we had to stay close to the way they described their findings. Thus, when we describe knowledge and skills from an organizational level, we intend to illustrate knowledge and skills which were found as important throughout the organization as a whole. When knowledge and skills are described on the people level, we try to outline the knowledge and skills of individual people.

3. Results

3.1 Factors and consequences – A review from 1970 - 1989

Six articles from the first two decades were classified as highly relevant. First, we provide some background information about this decade and describe the nature of the articles. Then we outline the categorization of consequences and factors, and finally we construct a graphic representation integrating all identified factors and consequences from this period and discuss underlying dimensions. The factors and consequences we found are described in italics.

3.1.1 Spirit of the age and nature of the articles

Authors from the 70's and 80's do not yet speak of e-HRM, but mostly use the terms Human Resource Information Systems or HRIS (e.g. Mathys & LaVan, 1982), Computerized Information systems in personnel (Tomeski & Lazarus, 1974) or Personnel Systems (Lederer, 1971) for describing computerized support for the personnel department. For the purpose of clarity and consistency, we further use the term HRIS in this section. The term e-HRM was not yet used since the initial systems were mainly introduced for supporting administrative and digitalized tasks in the HR function without the link to electronic internet-based support systems of HR departments.

We identified two salient research streams in the 70's and 80's. One stream does not discuss success or failure of implementations but rather describes the status of HRIS in organizations by exploring which areas are being automated, and which factors stimulate or impede the adoption of an HRIS (Mayer, 1971 ; Tomeski & Lazarus, 1974; Mathys & LaVan, 1982; Lederer, 1984; Magnus & Grossman, 1985). A second stream describes factors leading to implementation consequences (DeSanctis, 1985; Taylor & Davis, 1989), however research into the effectiveness of HRIS systems is still barely addressed (DeSanctis, 1985). Also, we did not find any statistical research in these initial decades.

Increased reporting requirements demanded by the government (e.g. due to Equal Employment Opportunity Act (1965) in the USA) and growth of organizational size (and thus the need for more advanced and comprehensive data storage and retrieval) are mentioned as major pressures for adopting digital systems (Hennessey, 1979). Additionally, an increase in white collar work and the knowledge and skills that come with these changes (DeSanctis, 1986), made organizations realize their great dependency on talented and highly skilled managerial and technical personnel and with it, the need to facilitate and retain those people (Hennessey, 1979). Consequently, payroll systems (e.g. Lederer, 1971), employee records (Magnus & Grossman, 1985), compensation and benefits administration (Magnus & Grossman, 1985), government reporting (DeSanctis, 1986) and skill inventories (Hennessey, 1979) were the first to be automated.

3.1.2 Consequences of HRIS implementations

In total, we found ten consequences which we labeled as either *organizational consequences* or *people consequences*. As mentioned earlier, research traditionally distinguishes consequences in operational, relational and transformational (Lepak & Snell, 1998; Reddick, 2009) and we therefore used these as subcategories. *Table 2* summarizes our findings.

***Table 2**: Consequences of HRIS implementation 1970 - 1989*

Category	*Consequences*	*Example from literature*
Organizational consequences	Operational	
	Costs Cost savings	Covers all subcategories: *'Personnel administrators' most frequent comments about the value of the computer include the following: faster reporting, absorbs increased workload without expanding staff, some reduction of clerical costs, improved accuracy of reports, frees personnel staff for more important duties, generates information not previously obtainable..'* - Tomeski & Lazarus (1974, p. 171)
	Effectiveness Information provision Accuracy of reports	
	Efficiency Productivity Reporting capability Time personnel staff spent on clerical task	
People consequences	*Attitudes/beliefs* Impersonality of computerization (counteracted)	*'..one could easily envision union resistance to the 'impersonality' of computerization. This was not the case however..'* - Mayer (1971, p. 34)
	Knowledge & skills Understanding of systems	*'Personnel administrators' most frequent comments about the value of the computer include the following:..forces better understanding of systems'* - Tomeski & Lazarus (1974, p. 171)
	Satisfaction Top management satisfaction with HRIS Personnel department satisfaction with HRIS	*'Perceived satisfaction with the HRIS on the part of the personnel department was found to be related to the total number of HRIS responsibilities and user involvement during systems development'* - DeSanctis (1986, p. 22/23)

Organizational consequences

In their comparative quantitative survey research involving 70 public organizations and 17 private organizations, Tomeski and Lazarus (1974) found that an HRIS implementation, from the perspective of a personnel administrator, holds the following benefits: improved *information provision*, faster *reporting capability*, absorption of *increased workload without an in increase in staff*, reduction of *some clerical costs*, improved

accuracy of reports, freeing personnel staff for more important tasks. Minor overall cost savings were also indicated by the participants.

People consequences

Further, Tomeski and Lazarus (1974) revealed that the adoption of HRIS leads to better *understanding of systems* from the perspective of personnel administrators. The use of a computer system thus seems to contribute to an increased knowledge of systems operating in an organization.

Other people consequences were identified by DeSanctis (1986) in her survey of 171 members of the Association of Human Resource System Professionals (HRSP, Inc) as *top management satisfaction* and *personnel management satisfaction*. She discovered top management and personnel management often value using HRIS. This outcome is affected by certain factors, which we outline in the next section.

Finally, in his random survey of 375 major US corporations Mayer (1971) found the *impersonality of computerization* as a potential threat, or negative consequence, to the 'soft side' of organizations. In this era, a lot of employees questioned the benefits of technology and were afraid that technology in the personnel department would lead to impersonal work methods in a department which was characterized by its personal approach. However, the survey yielded that fear for dehumanizing the personnel department was ungrounded.

3.1.3 Factors affecting HRIS adoption

In sum we identified twenty seven factors, which we classified along four categories: *technology factors*, *organizational factors*, *people factors* and *environmental factors.* Also, we divided the factors along the two streams of research we discussed above: factors which affect adoption of a system and factors which affect HRIS consequences. *Table 3* and *Table 4* summarize these findings. Below we discuss the literature on HRIS adoption (reflecting 22 of 27 factors) in the 1970's and 1980's.

Technology factors

In a survey of 1,000 personnel journal subscribers working in diverse industries and holding different professional titles, Magnus and Grossman (1985) revealed that finding appropriate *software for specific needs* to be problematic in the selection of an HRIS. In their search for an external software package, organizations seem to have difficulties in finding software which fully fulfills their personnel departments needs. Closely related to this issue is the *need to customize purchased software* (Magnus & Grossman, 1985). When external software packages do not fulfill personnel department's needs, customization may provide a solution. However, Lederer (1984) warns for the tailoring of a purchased system since this may turn out to be problematic due to the potential output errors when tailoring does not accompany the basic system, problems with updates from the vendor and difficulties in establishing responsibility of a problem (is the problem caused by the vendor's basic program or is it due to the tailoring?). He therefore recommends not to modify a vendor's program at all and to use exits and front ends instead. But still, the best solution according to Lederer (1984) is a full understanding of the new HRIS and the organizations' needs, since this will minimize the need for modification (Lederer, 1984).

The same survey by Magnus and Grossman (1985) also yields *interfacing with corporate headquarters*, *integrating HRIS with payroll and benefits systems* and *centralization of records* as important technology issues in computerizing the personnel department which could, when difficult to solve, impede the adoption of an HRIS. These factors all reside in the need for integration, which is considered to add to the success of an HRIS system (Tomeski & Lazarus, 1974).

Further, the *current computer capability* in an organization was also reported to influence the extent of computerization of the personnel department (Mayer, 1971). According to these findings, a new HRIS will demand a minimum capability. If an organization lacks this capability, it could limit the adoption of a system. Finally, in a comparative survey research on governments' and businesses' state of HRIS, the fact that *computerization was time consuming* and *computer output was unreliable* were found as factors inhibiting the adoption of computers in the personnel department (Tomeski & Lazarus, 1974).

Table 3: *Factors affecting HRIS adoption 1970 - 1989*

Category	*Factors*	*Example from literature*
Technology factors	<u>*Applications & characteristics*</u> Reliability of HRIS output	*'Personnel administrators often report the following difficulties with computerization: ..computer output is unreliable..'* - Tomeski & Lazarus (1974, p. 171)
	<u>*Status quo*</u> Current computer capability	*'The variety of computer utilizations in personnel is limited for the most part by the..data storage/retrieval capacity available to him(personnel administrator)'* - Mayer (1971, p. 30)
	<u>*Integration/alignment*</u> Customization Integration of systems Interfacing with corporate headquarters Centralization of records	*'Systems issues(in adopting an HRIS) included: .. the need to customize purchased software packages, going from decentralized to centralized records, integrating personnel/payroll/benefits systems and interfacing with corporate headquarters'* - Magnus & Grossman (1985, p. 46)
	<u>*Project*</u> Software that matches needs Duration of computerization	*'Systems issues(in adopting an HRIS) included: finding appropriate software for specific needs..'* - Magnus & Grossman (1985, p. 46)
Organizational factors	<u>*Demographics*</u> Sector Organizational size	*'..employee population size and..were reported to be the most influential factors in implementing personnel EDP (Electronic Data Processing) programs'* - Mayer (1971, p. 35)
	<u>*Knowledge & skills*</u> Technical personnel	*'Major difficulties (in computerizing the personnel department) are..having people available who understand the system'* -

		Magnus & Grossman, (1985, p. 46)
	<u>*Organizational policies & practices*</u> Securing privacy	*'In light of respondents' concern about system accessibility, there also must be a system of controls to both regulate and monitor access to the HRIS'* - Taylor & Davis (1989, p. 575)
	<u>*Resources*</u> Budget/Internal costs Available resources (people/time)	*'..top on the list of problems among survey respondents was cost or budget limitations'* - Magnus & Grossman (1985, p. 46)
People factors	<u>*Attitude/beliefs*</u> Top management attitude	*'Many personnel departments have endured conflicts with their MIS departments..Nevertheless, the planning and development of an HRIS requires the participation of the MIS'* - Lederer (1984, p. 28)
	<u>*Communication*</u> Congruence between MIS/DP needs and personnel department needs Communication with technicians	*'Personnel administrators often report the following difficulties with computerization: ..difficulty in communicating with computer technicians..'* - Tomeski & Lazarus (1974, p. 171)
	<u>*Support & commitment*</u> Imagination of personnel administrator Priority towards implementation of system	*'Personnel administrators often report the following difficulties with computerization: ..other areas are given higher priority..'* - Tomeski & Lazarus (1974, p. 171)
	<u>*Training*</u> Training	*'Major difficulties (in computerizing the personnel department) are training staff to use the system'* - Magnus & Grossman (1985, p. 46)
Environmental factors	Union resistance (not found to have an effect)	*'..union resistance to the implementation of personnel computer systems was considered inconsequential'* - Mayer (1971, p.34)

Organizational factors

Most organizational factors we identified comprise demographics, such as *organizational size* (Mayer, 1971) and *sector* (Mayer, 1971; Tomeski & Lazarus, 1974). In his survey of 375 major U.S. corporations, Mayer (1971) found that type of industry or business did not influence amount of computerization in the organization. An explanation for this finding is provided by Mayer, who states that personnel departments in different industries are responsible for similar tasks (Mayer, 1971). Tomeski and Lazarus (1974) show that federal departments and

private sector organizations made earlier use of an HRIS than did local governments. This is illustrated in their research by the financial expenditure of these organizations as opposed to local governments. The latter tend to spend less money on HRIS, a smaller percentage of the personnel department budget and a smaller percentage of the computer department budget (Tomeski & Lazarus, 1974). We therefore suggest that available budget is one of the factors underlying the *sector*-factor. Moreover, Organizational size was found to be positively related to computerization, since the administrative burden increases with an increase in personnel (Mayer, 1971) and computers are seen as a potential solution to this problem.

Another important organizational factor is presented by Taylor and Davis (1989) in their survey of 223 undergraduate business management students. They found that *securing privacy* was a serious concern when implementing an HRIS, since violating ethical concerns affects employees' attitudes and beliefs towards a system and can have legal ramifications (Taylor & Davis, 1989). In specific, they revealed that individuals do not perceive the sharing of data as problematic, but are more worried about the accessibility and security of personal data. Concerns about accessibility are further influenced by the sensitivity of the data (fringe benefits, compensation and education were seen as most sensitive) and the person with access to the data (co-workers were the least preferred group). Knowledge of which personal information is stored in HRIS and the possibility to verify the accuracy of this data were reported as important factors in mitigating dysfunctional attitudes of personnel towards HRIS usage (Taylor & Davis, 1989). Further, according to the authors, employers should take visible steps in ensuring the confidentiality of such systems by limiting access to certain parts of the system (e.g. password usage) and by installing control mechanisms which can trace and monitor usage (Taylor & Davis, 1989).

Additionally, shortages in *technical personnel* were identified as problematic to the computerization of the personnel department (Magnus & Grossman, 1985). Organizations thus seem to have a lack of knowledgeable technical personnel. Lack of *sufficient resources* (e.g. time, personnel) for the data entry and conversion process were also found to limit computerization (Magnus and Grossman, 1985).

Finally, the factor *budget* was subject to research and was shown as an influential impediment in implementing an HRIS (Mayer, 1971; Magnus and Grossman ,1985). Organizations with modest budgets (Magnus & Grossman, 1985) or high internal costs (Mayer, 1971) were less likely to adopt a system for personnel.

People factors

Concerning people factors, we derived the following salient concepts: *top management attitudes towards the HRIS* (Mayer, 1971), *lack of priority given to HRIS* (Tomeski & Lazarus, 1974; Magnus & Grossman, 1985), *incongruence between needs of management Information systems (MIS)/data processing (DP) departments and personnel department* (Magnus & Grossman, 1985) and difficulties for *the personnel department in communicating with computer technicians* (Tomeski & Lazarus, 1974). In this context, Mayer (1971) described that higher managerial levels have to be convinced of the benefits of such systems in order to gain support. The survey by Mayer (1971) also showed that advocates of HRIS had to go up to higher managerial levels than was the case when advocating for computerized systems in other functional areas. An HRIS was simply not

perceived as important by top management since they were seen as expensive and their suggested benefits were often exaggerated (Mayer, 1971). It was therefore hard to justify the costs of such systems.

Further, according to the survey by Magnus and Grossman (1985) the incongruence of needs of the MIS/DP departments and the personnel department puts a serious limitation on the adoption of an HRIS. Traditionally the relationship between the personnel department and MIS and DP departments was not good, with the personnel administrator and the computer administrator expressing different views regarding computerization, while the communication between these departments was also problematic (Tomeski & Lazarus, 1974).

Other people factors were labeled as *training* (Magnus & Grossman, 1984). According to the authors, training personnel to acquire the necessary knowledge and skills to use an HRIS seemed to be a major difficulty. We suggest the novelty of such systems in an area which traditionally was not technically skilled as an explanation for these difficulties.

Another remarkable factor identified by Mayer (1971) was that the computerization of the personnel department was partly limited by what he calls *imagination of use by the personnel administrator*. According to the author the amount of computerization in the personnel department was dependent on what the administrator sees as being an improvement to the department. Since this person was the one working with the system, he also was the one advocating for a new system when he/she finds it necessary. This was typical of the 70's and 80's where the personnel departments were highly dependent on specialized administrators to use HRIS, since the use of such systems mostly required complex technical knowledge (DeSanctis, 1986). This high dependency on the personnel administrator could also prove to be problematic since as noted above, communication between personnel and technical staff was difficult in these initial years(Tomeski & Lazarus, 1974).

Environmental factors

We found one environmental factor affecting the adoption of HRIS in the form of *union resistance* (Mayer, 1971). However, the study of Mayer (1971) reported that this factor did not influence the adoption of an HRIS. Initial warnings for 'dehumanizing the personnel department' were counteracted by positive experiences in using payroll- and record keeping applications (Mayer, 1971).

3.1.4 Factors affecting HRIS consequences

The second, and smaller stream of research in the 70's and 80's focused on factors affecting consequences of HRIS (*Table 4*). We begin by outlining technology factors, proceed to organizational factors and conclude our discussion with people factors. No environmental factors were found.

Technology factors

In her survey of 171 members of the Association of Human Resource System Professionals representing different sectors, industries and functions DeSanctis (1986) reported the *duration of HRIS development* and the *total number of applications comprising the HRIS* as significant technology factors which positively influenced top management satisfaction with the HRIS. Further, she found that the *number of responsibilities of the HRIS* had a positive impact on personnel department's satisfaction with the HRIS.

Table 4: *Factors affecting HRIS consequences 1970 - 1989*

Category	Factors	Example from literature
Technology factors	<u>Applications & characteristics</u> The number of responsibilities of the new system The number of applications comprising the HRIS <u>Project</u> Duration of development of a new system	Covers both categories: 'With regard to top management satisfaction three factors related meaningfully to this variable: the length of time spent on HRIS development, the total number of applications comprising the HRIS...' - DeSanctis (1986, p. 23)
Organizational factors	<u>Integration/Alignment</u> Alignment of HR plan with corporate plan	'With regard to top management satisfaction three factors related meaningfully to this variable…whether or not the human resource plan was integrated with the corporate strategic plan' - DeSanctis (1986, p.23)
People factors	<u>User/stakeholder involvement</u> User involvement	'Perceived satisfaction with the HRIS on the part of the personnel department was found to be related to…user involvement during systems development' - DeSanctis (1986, p. 22/23)

Organizational factors

One organizational factor was identified as a positive influence on HRIS satisfaction of top management, namely *strategic alignment of HR plan and corporate plan* (DeSanctis, 1986). According to DeSanctis (1986), lack of planning from the corporate level down to the divisional level made a coordination of plans between the personnel department and MIS, like for instance an HRIS, very difficult to succeed.

People factors

In terms of people factors, DeSanctis (1986) found that *user involvement* during systems development positively influenced HRIS satisfaction of the personnel department. She suggested that the larger the organizational investment in HRIS (development time and user involvement), and the greater the system's influence (number of responsibilities and applications) the more it is valued by the organization (DeSanctis, 1986). This might be explained by escalation of commitment theory (Staw, 1976), which states that once people or organizations put great effort and resources into a course of action they will continue with it and make it highly important, while they probably already know that the course of action was a mistake or failure. This might be an avenue for future researchers to explore.

3.1.5 Towards a framework

When we summarize the factors identified in the 70's and 80's, it appears that research mainly focused on factors affecting the adoption of an HRIS while factors affecting consequences of HRIS implementations were

barely investigated. In total, the factors affecting adoption comprised 81% of all factors found (22 of 27). DeSanctis (1986) and Taylor and Davis (1989), who are authors of recognized HRIS research in the late 80's, were the first to describe such factors. Scholars from earlier years were apparently still engaged with conceptualizing and processing the introduction of the new HRIS phenomenon. Thus, these decades mostly added to the first research stream we described in our method.

Considering the factors we found, the most limiting factor for HRIS adoptions was probably the attitude and support of top management. As mentioned above, personnel systems were not seen as important and they were given no priority, mostly due to the fact that benefits could not justify costs (Mayer, 1971). Given the rising governmental and competitive pressures, we expect top management to release the breaks and eventually fall for the adoption of a more sophisticated HRIS. As Magnus and Grossman (1985) showed, signs of shifting top management views are becoming increasingly visible by the growing budgets for these systems.

Also, in these initial years not many consequences were empirically confirmed. A number of suggestions were made, but these lacked empirical groundings and were not useful for our review. An important finding is that consequences are mostly reported separately from factors. The study of DeSanctis (1986) was the only exception. In other words, no causal linkages were examined between most factors and consequences. Additionally, factors and consequences were presented without support for how exactly certain factors influenced success or failure and how certain consequences were achieved. We almost exclusively found survey research which simply summarized findings and percentages without providing a deeper reasoning and understanding of tested outcomes and relationships.

Further, this period was dominated by three salient studies, with Tomeski and Lazarus (1974) as the most frequently cited one. Seven of our ten identified consequences were reported in their survey of personnel administrators, which makes these findings rather one-sided. *Figure 4* illustrates our contingency model of findings from these two decades while *Table 5* specifies all investigated relationships.

As mentioned earlier, many scholars in the 1970's and 1980's were in the beginning stage and simply too 'green' to focus on consequences of implementations and were still busy investigating which determining factors led to the rise of a computerized personnel department. These words also receive historical backing from Mathys and LaVan (1982) which state that measures of HRIS effectiveness are lacking and need to be developed in order to evaluate human resource efforts. Mayer (1971) also claimed that more research is needed in order to identify the true cost-benefits tradeoffs of such systems. He further doubted whether specific system applications with high developmental costs would truly find acceptance in organizations.

We hold positive expectations for the future e-HRM usage since we saw the first signs of positive consequences in terms of increased efficiency and effectiveness, and expect to see more positive consequences in later decades. With an increase in complexity of e-HRM features also comes an increased chance of failure, and thus we find it probable that later decades also yield more negative consequences. Moreover, we expect to find a greater variety and a shift of consequences. The availability of advanced mainframe technology (e.g. packaged applications and database management systems), the development of more easy retrieval languages and microcomputers and the increasing technical knowledge of the personnel staff led to a separation of the HRIS from the MIS department

in the late 80's (DeSanctis, 1986). We therefore expect the communication problems between departments, which were mentioned by different authors as a serious threat, will be of lesser concern.

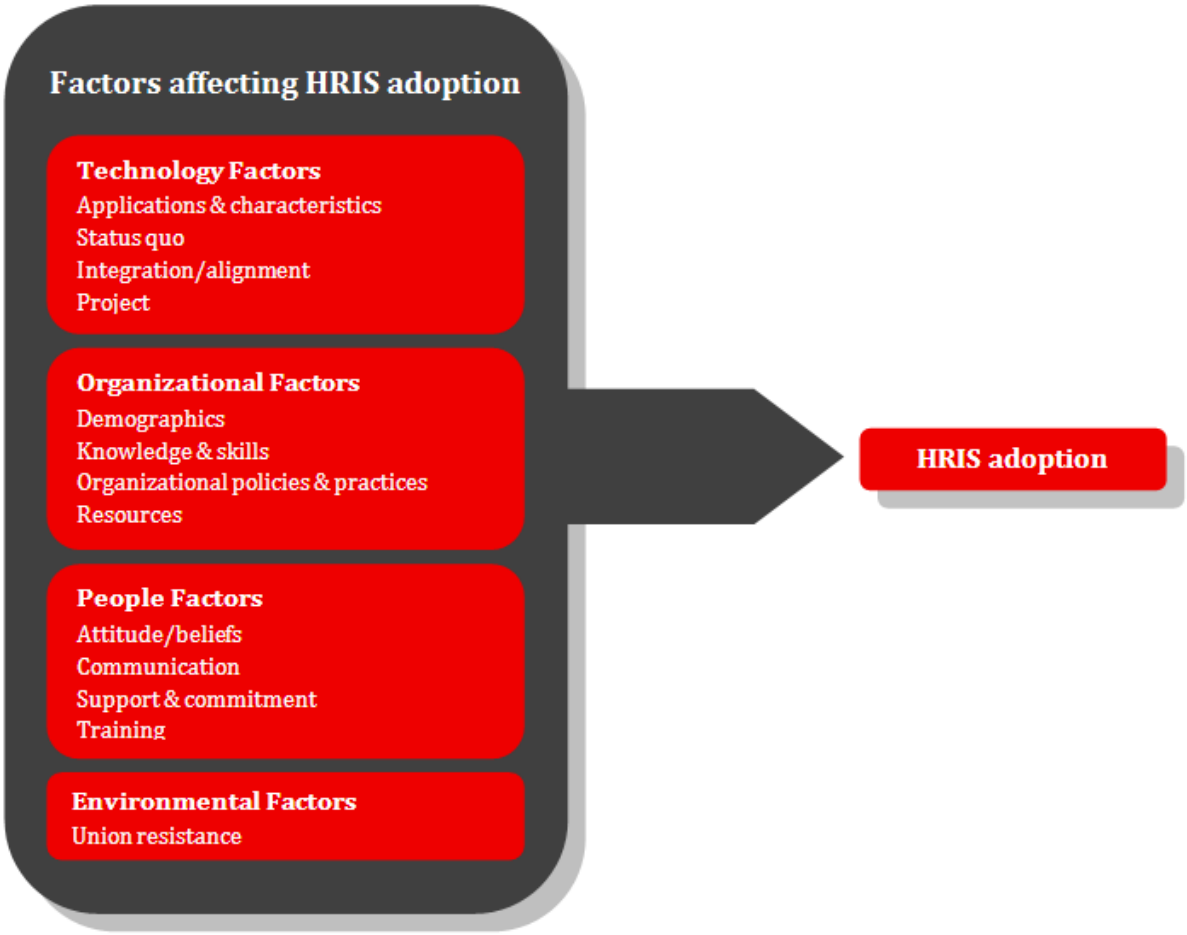

Figure 4: *Contingency model: HRIS adoption in the 70's and 80's*

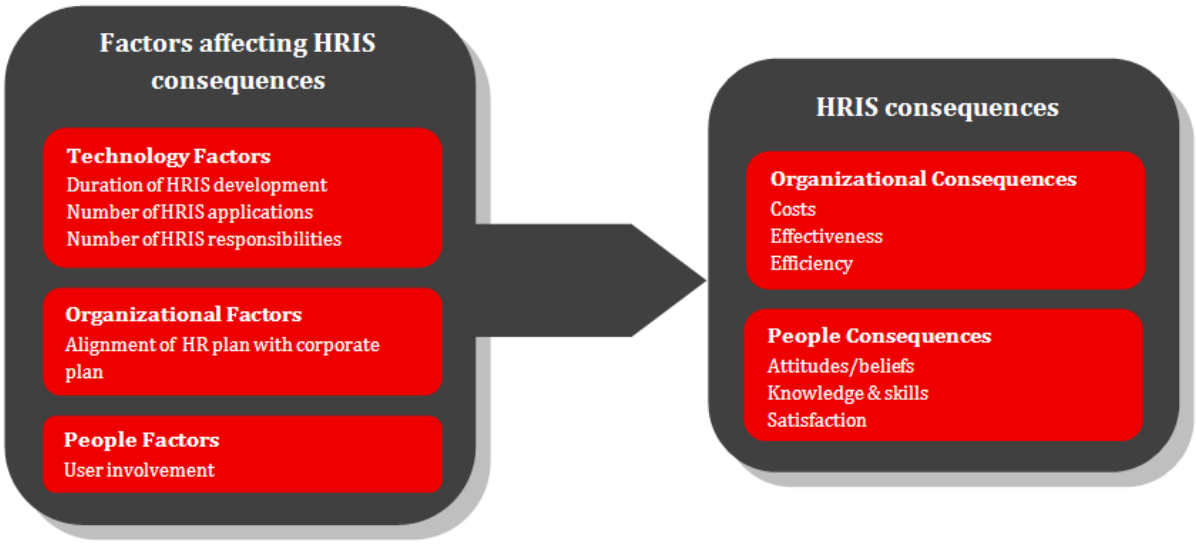

Figure 5: *Contingency model: HRIS consequences in the 70's and 80's*

Table 5: *Relationships investigated in the literature 1970 – 1989*

+ = positive effect, - = negative effect, 0 = no effect

Category	*Factor*	*Consequence*
Technology factors	Duration of HRIS development	+ Top management satisfaction with HRIS
	Total number of applications comprising the HRIS	+ Top management satisfaction with HRIS
	Number of responsibilities of HRIS	+ Personnel departments' satisfaction with HRIS
Organizational factors	Strategic alignment of HR plan and corporate plan	+ Top management satisfaction with HRIS
People factors	User involvement	+ Personnel departments' satisfaction with HRIS

3.2 Factors and consequences – A review from 1990 – 1999

We analyzed 12 relevant articles in this decade. Just as in the prior decades, we start with providing insights into the time period and discuss the nature of the articles. Then we proceed by presenting our findings on salient factors and consequences.

3.2.1 Spirit of the age and the nature of the articles

Similar to the 70's and 80's the term e-HRM had not emerged the in literature. This might be related to the fact that the internet was still not widely used and therefore the 'e' of e-HRM was not relevant yet. Accordingly, we will continue using the term 'HRIS' in this section. This seems to indicate that companies in the 90's did not progress in terms of computer sophistication, and were still primarily interested in applications which elevated their administrative burden. To a certain extent, we found this was the case. However, organizations also showed an increased awareness for the broader possibilities of implementing a computer system in HR. For instance, Kossek et al. (1994) investigated an organization with the aim to implement an HRIS for strategic, next to administrative, purposes. Thus, while the type of applications did not fundamentally change, the ends for which the system was used did.

Also, in research we see a transition from literature mostly directed towards the status of HRIS in organizations to more in-depth research on for instance the different definitions users hold (Mathieson, 1993), different attitudes towards the HRIS (Kossek et al., 1994), international differences in HRIS adoption and usage (Martinsons, 1994, Hannon et al., 1996), studies on single applications (e.g. Martinsons, 1997) and even a quantitative study which relates different factors to HRIS user satisfaction and system usage (Haines & Petit, 1997). However, there is still very few research on relationships between factors and consequences. Most papers present either factors affecting adoption or success in a broad sense and consequences of HRIS implementations without explicitly mentioning the factors affecting them. Furthermore, when such relationships are described, they mostly consisted of survey research presenting percentages or anecdotal evidence from qualitative studies. Only Sturman et al. (1996), Haines and Petit (1997) and Eddy et al. (1999) provided us with statistical evidence for relationships between factors and their consequences, which is 25% of all papers.

3.2.2 Consequences of HRIS implementations

We identified 24 consequences and categorized them as *organizational consequences* and *people consequences*. All consequences are summarized in *Table 6*.

Organizational consequences

In their longitudinal case study of an organization-wide HRIS implementation project in a large energy company Kossek et al. (1994) found *time savings* realized through the increased automation of routine HR tasks as a consequence of the implementation. Time savings were also reported by Sturman et al. (1996) in their experiment of 80 employees of a Fortune 500 company in the USA on computer decision aids for flexible benefits decisions. The authors state that by using computer decision aids, benefits experts were able to save considerable time. These experts were mostly highly valued within their organizations due to their knowledge and skill level and could be used for more important tasks within an organization. In line with these findings, Martinsons (1994), who conducted a benchmarking survey study on HRIS in Canada and Hong Kong, showed that HRIS usage led to *freeing professionals for more important tasks*.

Also, Broderick and Boudreau (1992) conducted case studies of ten US-based Fortune 500 companies , which were considered 'leaders' in HRIS usage, and reported that the automization of routine tasks facilitated faster

diagnosis of HR problems and more HR work was done with less personnel, which indicates an increased productivity.

Other consequences of increased automation of routine tasks we found in the literature were *more accurate and timely responses to government and management initiated changes, better review and rationalization of HR policies and programs* and *cost effective administration and record keeping* (Broderick & Boudreau, 1992). Cost reductions were also mentioned as by Hannon et al. (1996) in their systematic survey of 11 US-based multinational corporations (MNCs) and by Broderick & Boudreau (1992). Further, HRIS implementations were reported to *improve accuracy of administrative tasks* (Broderick & Boudreau, 1992) and *uniformity of data* (Hannon et al., 1996). Uniformity of data was achieved through systems integration in such a way that there is comparable data throughout the company to satisfy divisional, corporate and governmental reporting requirements. According to the author, it is important to consider that integration is not achieved at the expense of losing responsiveness to local business unit needs (Hannon et al., 1996).

Hannon et al. (1996) also acknowledged a negative outcomes of *dependence on outside vendors*. The latter was occured when a system is bought off-the-shelf or developed outside of the company. This creates a dependency on external firms for maintenance, support and system extensions and therefore bares a certain risk. Organizations have to determine whether the benefits of outsourcing outweigh the downsides.

Furthermore, Kossek et al. (1994) revealed that the implementation of an HRIS can lead to an enhanced *role of HR professionals as information brokers* (Kossek et al., 1994). As a result of the HRIS implementation *previously unconnected departments started working with each other* to which the HR professionals provided *centralized decision support.* In line with this finding, Broderick and Boudreau (1992) described that an HRIS implementation is successful insofar it *improves the work of key HR decision makers.*

Other positive outcomes of implementing an HRIS on the organizational level were more *consistent HR practices throughout the firm* (Broderick & Boudreau, 1992), more *consistent understanding and communication of HR policies* (Broderick & Boudreau, 1992) and *increased computer literacy* (Broderick & Boudreau, 1992). According to the authors, in order to operate an HRIS, employees need to develop the necessary computer skills and knowledge. Finally, Sturman et al. (1996) reported that the use of decision support systems and expert systems in the selection of benefits improved *benefits selection quality* ($p<0,01$) as opposed to selecting benefits without an aid. Additionally, those using expert systems reached higher benefits selection quality than those using a decision support system ($p<0,05$). Benefits selection quality was measured by the congruence of an employee's desired benefits and the ones he or she would choose by using a system (Sturman et al., 1996).

Table 6: *Consequences of HRIS implementations 1990 - 1999*

Category	Consequences	Example from literature
Organizational consequences	Operational	

	Costs Cost savings	'Comprehensive HR databases, widespread system availability to employees and powerful transaction processing and reporting applications had reduced the cost..of these corporate administrative activities' - Broderick & Boudreau (1992, p. 500)
	Effectiveness Accuracy and timeliness of responses to change Review and rationalization of HR policies Accuracy of administrative tasks Uniformity of data	'Comprehensive HR databases, widespread system availability to employees and powerful transaction processing and reporting applications had.. improved the accuracy of these corporate administrative activities' - Broderick & Boudreau (1992, p. 500)
	Efficiency Time savings Faster diagnosis of HR problems More HR work with less HR personnel (productivity) Freeing professionals for more important tasks	'..the main value of HRIS stems from time savings achieved by automating repetitive clerical tasks' - Kossek et al. (1994, p. 144)
	Relational	
	Communication Consistency in understanding and communication of HR policies	'The HRIS groups interviewed described the success of HR computer systems in many terms:..more consistent understanding and communication of HR policies..' - Broderick & Boudreau (1992, p. 502)
	HR status HR's role as information brokers and decision enablers	'..the new HRIS will enable HR to perform new or enhanced roles of information brokers and decision enablers' - Kossek et al. (1994, p. 148)
	Relationships Dependence on vendors	'..the possibility of an inevitable, constraining and long-term (i.e. over the lifetime of the application) dependence upon the third-party vendors who control the application and the data' - Hannon et al. (1996, p. 251)
	Service Decision making quality Computer literacy Centralized decision support Benefits selection quality	'Decision quality for employees' desired benefits selection will be higher for those using Expert Systems and Decision Support Systems than for those not using a decision aid' - Sturman et al. (1996)
	Transformational	

	Integration/alignment Integration of decentralized units Consistency of HR practices throughout company	'The HRIS groups interviewed described the success of HR computer systems in many terms:..more consistent HR practices throughout the firm' - Broderick & Boudreau (1992, p. 502)
People consequences	Attitudes/beliefs Perceptions of fairness Perceptions of privacy invasiveness Perception of applicants by HR directors	'..the adjectives selected to describe applicants who use the internet are much more positive than those used to describe either online computer resume services or faxed resumes' - Hubbard et al. (1997, p. 36)
	Satisfaction Benefits satisfaction User satisfaction	'The results in table 3 show a strong positive relationship between the percentage of on-line applications and user satisfaction' - Haines & Petit (1997, p. 269)

People consequences

Sturman et al. (1996) also found that *benefits satisfaction* was higher for employees using an expert system (β=0,32; $p < 0,05$) as opposed to not using such a system for their choices (Sturman et al., 1996). In their survey of 152 members of the Canadian Association of Human Resource Systems Professionals (CHRSP) which interacted directly with an HRIS for their work Haines and Petit (1997) mentioned *user satisfaction* as a consequence of an HRIS implementation and investigated a number factors leading to this consequence, which we will outline further on. This factor is also found by Elliot and Tevavichulada (1999) in their survey research of 77 HR professionals in public and 77 in private sector companies. These HR professionals indicated they were satisfied with computer usage in HRM functions (Elliot & Tevavichulada, 1999).

Positive evidence for computerizing the HR department is given by Hubbard et al. (1997). In their survey of 32 personnel directors working in companies in the US they found that *applicants* who used internet as a job-search method were *viewed more positive* than applicants who used a fax or online computer resume services in terms of progressiveness, creativity and innovativeness.

From the employee's point of view, *perceptions of privacy invasiveness* and *perceptions of fairness* are a major concern when implementing an HRIS (Eddy et al., 1999). Eddy et al. (1999) investigated different factors which influenced these perception by means of an experiment of 124 employed persons enrolled in an MBA course on their privacy concerns of a hypothetical HRIS. We will outline these factors in a later section.

3.2.3 Factors affecting HRIS adoption

In the 90's we identified sixty four factors which were found to affect the adoption of an HRIS. We maintained the previous categorization scheme for *technology, organizational, people and environmental factors* (*Table 7*).

Technology factors

Broderick and Boudreau (1992) reported that building *applications which meet business unit needs* improved the quality of new HR computer applications, and resulted in more support from business units for these systems. Accordingly, the authors stated that the better the fit between the needs of a business unit and the functionalities of an application, the greater the chance for organizational success. Further, Hannon et al. (1996) documented that *problems with ensuring report relevance and accuracy* hindered success. This factor was also defined as *'erroneous data or information and reports that provide little utility to decision makers'* (Hannon et al., 1996, p.254). This finding is also supported by Broderick and Boudreau (1992) who, as mentioned earlier, proposed that technology in HR is successful insofar key HR decision makers believed computers helped them do their jobs. Furthermore, *easiness of subsystem modification* was found to influence success (Kossek et al., 1994). Kossek et al. (1994) reported a failed implementation partly due to difficulties in modifying subsystems to respond to new needs.

In their survey Haines and Petit (1997) investigated the influence of *ease of use* (r=0,06), *usefulness* (r=0,07), the use of *online applications* (r=0,06), the *number of HR applications now running* (r=0,13) and the number of *HR applications planned* (r=-0,05) on system usage and found no significant relationships with system usage. Thus, although counterintuitive, the above findings showed that these technology factors do not seem to influence system usage.

Other authors reported on the influence of the *current systems architecture*, *data integrity* (the completeness and correctness of information as opposed to the real world it is supposed to model) and *integration of subsystems* on the success of the implementation of a new system (Kossek et al., 1994). Outdated and limited architectures, questionable data integrity and lack of integration showed to negatively impact HRIS implementation efforts (Kossek et al., 1999).

We also found technology factors related to the implementation project. Kossek et al. (1994) reported that *duration of development* influenced user involvement during development. The longer the development took, the more challenges it posed on maintaining support. *Disseminating information about existing applications* (Broderick & Boudreau, 1992) prior to adoption was also a significant factor to take into account during development. Collecting information about existing applications showed to have its share in improving quality of HR computer applications and organizations' ability to plan development of new systems. Scholars also discussed whether organizations should *outsource development* or keep it *in-house* (Haines & Petit, 1997; Kossek et al., 1994) The above mentioned survey of Haines and Petit (1997) found no significant relationship between in-house development and system usage (r=-0,02). Kossek et al. (1994) acknowledged the high financial risk of in-house development is one of the reasons for HRIS implementation failure, thus providing evidence for the negative outcomes of developing these systems in-house. The same authors provided support for *outsourcing development* and attributed the positive consequences of outsourcing to a better understanding of HR community's strategic needs by the outside vendor as opposed to internal information systems personnel. Moreover, the authors state that HR professionals could focus more on their core tasks when development was outsourced (Kossek et al., 1994). Finally, *documentation* (r=-0,10) of how a system operates and how it should

be used (e.g. requirements of system, architecture of system, codes, algorithms, user manuals) was not found to significantly influence usage of a system (Haines & Petit, 1997).

Table 7: *Factors affecting HRIS adoption 1990 - 1999*

Category	Factors	Example from literature
Technology factors	<u>Applications & characteristics</u> Applications meeting needs Modification of subsystems Ensuring report relevance and accuracy Ease of use Usefulness Online applications Number of applications now running Number of applications planned	'Another concern (concerning problematic areas in HRIS development) for many participants was ensuring report relevance and accuracy' - Hannon et al. (1996, p. 254)
	<u>Status quo</u> Current systems architecture	'..many new decision support applications could not be met under the existing Corporate Human Resource Information System (CHRIS) because its current system's architecture was payroll-driven' - Kossek et al., (1994, p. 142/143)
	<u>Data characteristics</u> Data integrity	'…many new decision support applications could not be met..(due to the fact that) data integrity was questionable'..- Kossek et al., (1994, p. 143)
	<u>Integration/alignment</u> Integration of subsystems	'..many new decision support applications could not be met under the existing Corporate Human Resource Information System (CHRIS) because..its subsystems were not well integrated' - Kossek et al., (1994, p. 142/143)
	<u>Project</u> Disseminating information about existing applications In-house development Outsource development Duration of development Documentation	'Another key organizational change in systems development approach to the new HRIS involved the use of an outside HR-oriented vendor, as opposed to internal information systems personnel, who were likely to have less understanding of the HR community's strategic needs' - Kossek et al. (1994, p. 143)
Organizational factors	<u>Demographics</u> Age of HRIS department Organizational size Size of HR department Size of IS department Size of HRIS department Sector	'HR managers in larger firms have made most extensive use of IT (in terms of CHRIS or Computer-based Human Resource Information System))' - Martinsons (1994, p. 313)
	<u>Knowledge & skills</u> Technical expertise	'..high technology firms in our sample had more sophisticated HRISs' - Hannon et al. (1996, p. 256)

	Familiarity with good information management practices Knowledge of technology developments Computer experience of firm	
	<u>Project</u> Canvassing business unit needs Diagnosing and managing power dynamics between HR and other functions and within HR Managing communication between HR and other functions and within HR Collaboration across diverse business units	'By canvassing business unit needs…these central HRIS groups were able to improve the quality of HR computer applications and increase business unit enthusiasm and support for it' - Broderick & Boudreau, 1992 (p. 499)
	<u>Resources</u> Budget Shortages in human resources Concerns about economic and operational feasibility	'..the CHRIS (Corporate Human Resource Information System) project was scrapped..due to rising costs estimates' - Kossek et al., 1994 (141)
People factors	<u>Demographics</u> Employee's age Employee's education Employee's experience in present position Employee's experience in HRM Employee's experience in organization	No citation available. Findings were all presented by Haines & Petit (1997) in a table (Table 1, p.267)
	<u>Knowledge & skills</u> Definitional variations User skill level HR professionals' technical knowledge and skills Employee's understanding of software Employee's understanding of hardware Employee's understanding of programming Employee's computer experience	'More computer experience and a better understanding of computer programming were accompanied by more use of systems' - Haines & Petit (1997, p. 267)
	<u>Support & commitment</u> Support from highly skilled users Financial priority from top management General management support Immediate superior support HR staff and management/executives support IS staff and management/executives	'.. if new HRIS initiatives are to be successful, it is critical to have experienced users show strong support' - Kossek et al. (1994, p.152)

	support Financial executives and staff support	
	<u>Training</u> Informal training and troubleshooting Face-2-face training Training in HRIS skills and knowledge Vendor training College courses (external) In-house training Self-training	'By..providing informal training and trouble shooting..central HRIS groups were able to improve the quality of HRIS computer applications and increase business unit enthusiasm and support for them' - Broderick & Boudreau (1992, p. 499/500)
	<u>User/stakeholder involvement</u> HR staff and management/executives involvement Involvement of line management and field units User involvement	'It is critical to involve line management and field units in the decision choices before large amounts of resources are invested (into implementing an HRIS)' - Kossek et al. (1994, p. 153)
Environmental factors	Country culture Political factors	'Political and cultural factors, rather than macroeconomic or technical factors, accounted for much of the difference in IT(in terms of CHRIS) use between Canadian and Hong Kong HRM organizations' - Martinsons (1994, p. 314)

Organizational factors

A number of organizational demographics were investigated by Haines and Petit (1997) in relation to system usage. They tested correlations of *age of HRIS departments* (r=0,11), *size of an organization* (r=-0,03), *size of HR department* (r=0,01), *size of IS department* (r=-0,14) and *size of HRIS department* (r=-0,07) and all factors showed insignificant relationships to system usage. However, Martinsons (1994) did find that *organizational size* and *sector* were determinants. Specifically, he showed that larger organizations reported more HRIS adoptions. When looking at sector, the most prevalent IT usage was in financial service, real estate and hospitality (Martinsons, 1994). We pose that these differences in findings are a consequence of the level of analysis. In this case we might say that size influences an organization's adoption of an HRIS (maybe as a result of the available budget in larger organizations), but does not necessarily influence the adoption of individual users within that organization. Unfortunately, levels of analysis are hardly discussed in current literature.

When looking at knowledge-based systems, Martinsons (1994) observed that shortages of *technical expertise*, *familiarity with good information management practices* and *knowledge of technology developments* were associated with the adoption of more strategic IT solutions. These findings were also supported by Hannon et al. (1996) who showed that companies with a high *technology level* and those who *keep up with technology changes* have more sophisticated HRIS. Although higher sophistication not automatically leads to success, we propose that more sophisticated systems have higher potential for success due to better functionality. However, in the

survey by Haines and Petit (1997) *computer experience of the firm* showed no significant correlation with system usage (r=0,11). Once again, the different findings could be explained by the level of analysis.

Another important organizational factor related to the implementation project was *canvassing organizational and business unit needs*, since developing a system which closely meets these needs is central to a system's success (Broderick & Boudreau, 1992). Further, Kossek et al. (1994) mentioned *diagnosing and managing power dynamics and communication between HR and other functions* as important determinants for successful adoption. In line with this, they found that the implementation of an HRIS requires *cooperation between diverse business units* which previously operated independently from each other (Kossek et al., 1994).

Finally, organization's resources were critical for successful adoption. Martinsons (1994) discovered that half of planned HRIS efforts were deferred. This was due to *budget* cuts in times of recession in Canada and shortages in *human resources* in Hong Kong. Martinsons (1994) also observed that concerns about *economic and operational feasibility* were major obstacles to adoption. *Costs* are mentioned by Kossek et al. (1994) as well, who outline that an HRIS implementation failed partly due to rising and unexpected costs during development. This underlines the importance of strictly canvassing organizational needs and carefully defining developmental costs before starting HRIS implementations.

People factors

Next to organizational demographics a number of individual demographics were discussed in the literature. Haines and Petit (1997) investigated the relationship between an *employee's age* (r=-0,09), *education* (r=-0,09), *experience in present position* (r=-0,12), *experience in HRM* (r=-0,07) and *experience in the organization* (r=0,03) and usage of HRIS but did not find any significant relationships. Thus, these demographics do not seem to have an influence on adoption at the individual level.

Individual's knowledge and skills is another area investigated by Haines and Petit (1997). It is important to distinguish this category from knowledge and skills on an organizational level, since the latter refers to knowledge and skill broadly available in an organization while the former refers to an individual's knowledge and skills. As mentioned in the method section, this distinction is analytical and not practical.

Haines and Petit (1997) tested relationships between an *employee's understanding of software* (r=0,04), *understanding of hardware* (r=0,06), *computer experience* (r=0,19) and *understanding of programming* (r=0,19) and the extent of system usage and found two significant relationships. Namely between understanding of programming and usage (r=0,19;p<0,05) and between computer experience and usage (r=0,19; p<0,05). This is not surprising, since an employee with considerable programming knowledge is expected to have an above average level of computer experience and thus a lower barrier to usage. A regression analysis showed that general computer experience was the factor underlying these individual factors (r=0,25; p< 0,01). These findings were also confirmed by Hannon et al. (1996) who report that *HR professionals' lack of technical knowledge and skill* was as a problematic area in HRIS development and maintenance (Hannon et al., 1996). Kossek et al. (1994) showed that *user skill level* can also have a negative impact. In their study higher skill levels were related to more negative attitudes towards HRIS. The authors stated that the reason for this was that HRIS were not always reflecting the most recent technological developments valued by these highly skilled users. Due to the

typical long development process of HRIS, by the time such projects were finished, they barely represented the latest technology. Thus, according to these findings, users with more developed computer skills seem to use systems earlier, but are generally less positive about it.

Mathieson (1993) revealed the factor *definitional variations*, a factor related to knowledge and skill level which influenced users' judgments of an HRIS. Additionally, experience with IS was found to influence a person's definition. The more experienced a person, the less aspects of a system he/she included in the evaluation of an HRIS. Experienced users seemed to hold a narrower definition of an HRIS as opposed to less experienced users and thus evaluated the system on less criteria. Mathieson (1993) further suggests that differences in definitions could hinder communication between users and IT analysts. He also stated that definitional variations can impact the evaluation of HRIS in terms of satisfaction, since the definition one holds of a system could influence the aspects one included into the evaluation (Mathieson, 1993). Also, information about an HRIS was not necessarily processed at the time one evaluated the HRIS, so it was important to have a consistent definition among users and developers from the individuals' first contact with the system (Mathieson, 1993).

Support from stakeholders was another important topic discussed in the literature. According to Kossek et al.'s research s*upport from highly skilled users* was critical for HRIS success (Kossek et al., 1994). *Lack of priority of top management* for a new system was also reported as a major hindrance to development, while the *support of (Senior) HR, financial executives and staff and IS executives and staff* showed to contribute to success (Hannon et al., 1996). Considering these findings we propose that in order to gain support, HRIS advocates (e.g. HR managers) need to quantify how an HRIS improves business operations for the different stakeholders.

Other research does not provide evidence for the benefits of stakeholder support. In the research of Haines and Petit (1997) *general management support* (r=0,12) and *immediate superior support* (r=0,10) were not found to significantly influence system usage. However, their inquiry only focused on the relationship with two variables. Further, as Haines and Petit (1997) revealed, user satisfaction and system usage are influenced by a number of other factors as well. We therefore propose that support from different stakeholders is essential to master HRIS implementations successfully.

The above mentioned research of Haines and Petit (1997) also investigated the effects of training. Specifically, their inquiry looked at the correlations between different training methods (*self-training* (r=0,09), *in-house training* (r=-0,02), *college courses* (r=-0,02) and *vendor training* (r=0,01) and system usage and did not find any significant relationships. *Training* was, however, important in enhancing HRIS support from business units, as well as providing *trouble shooting support* (Broderick & Bourdreau, 1992). Furthermore, Kossek et al. (1994) reported that *face-to-face training* more positively influenced intended HRIS usage than written communication ($p<0,05$). In order to move from intended usage to real usage, Kossek et al. (1994) suggested that users should acquire skills and knowledge to administer HRIS. The benefits of training were thus supported by several researchers, but also contradicted by others. Either way, it played a crucial role in successful HRIS implementations.

Finally, Kossek et al. (1994) showed that the factor *user involvement* was of great importance during HRIS development. Especially, *involvement of staff and management and line management and field units* in design

was found to enhance adoption. However, according to research by Haines and Petit (1997) user involvement was not correlated to system usage (r=0,07). One might expect an intense involvement during development to result in greater usage, but no empirical evidence was observed in their study . Hence, we expect other factors to mediate or moderate this relationship.

Environmental factors

Martinsons (1994) conducted a benchmarking study between Canada and Hong Kong to investigate the factors that accounted for the differences in HRIS adoption and found that *political* and *cultural (macro level) factors* played an important role, thus highlighting these as influential factors stimulating or inhibiting HRIS adoption in certain countries.

3.2.4 Factors affecting HRIS consequences

In total, we identified 45 factors affecting consequences of HRIS implementations. *Table 8* summarizes our findings.

Table 8: *Factors affecting HRIS consequences 1990 - 1999*

Category	Factors	Evidence from literature
Technology factors	<u>Applications & characteristics</u> Functionality of applications Ease of use Usefulness On-line applications HR applications planned HR applications now running System availability Type of technology used	'The results in table 3 show a strong positive relationship between the percentage of on-line applications and user satisfaction' - Haines & Petit (1997, p. 269)
	<u>Data characteristics</u> Wealth of available information	'..the wealth of information available…had also resulted in better informed policy decisions' - Broderick & Boudreau (1992, p. 500)
	<u>Integration/alignment</u> 'Patched' updating Comprehensive HR databases	'Comprehensive HR databases..resulted in better informed policy decisions' - Broderick & Boudreau (1992, p. 500)
	<u>Project</u> Outsourcing development In-house development Documentation	'..there was a strong positive relationship between the presence of complete, structured and well written documentation and user satisfaction' - Haines & Petit (1997, p. 268)
Organizational factors	<u>Demographics</u> Age of HRIS department Organizational size Size of HR department	'As can be seen in table 2, variables such as the size of the organization and the size of various departments or units did not explain user satisfaction.. to a great extent' - Haines & Petit

	Size of IS department Size of HRIS department	(1997, p. 267)
	<u>Knowledge & skills</u> Computer experience of firm	No citation available. Findings were all presented by Haines & Petit (1997) in a table (Table 2, p.267)
	<u>Organizational policies & practices</u> Privacy and fairness policies Degree of centralization of HR management Standardization of HR processes	'Organizational policies that provide for employee authorization before the release of personal information will be perceived as less invasive of privacy than policies that do not require such authorization' - Eddy et al. (1999, p. 340)
	<u>Project</u> Identification of organizational needs	'It is imperative to note that the modification of any HRIS needs to take into account the current and future needs of the organization' - Hannon et al. (1996, p. 249)
	<u>Strategic alignment</u> HR part of strategic business plan Strategic planning of HRIS	'..the Vice President-Human Resources began to report directly to the Chairman, and HR issues were also beginning to be a major portion of strategic business plans for the first time..' - Kossek et al. (1994, p. 142), in their case study of a successful HRIS implementation
People factors	<u>Culture</u> Culture of units	'Implementing a new HRIS requires new frames or socially constructed views and ways of thinking'...'If the HR community does not value HRIS skills..little change will occur, and most HRIS will remain focused on administrative over strategic decision support' - Kossek et al. (1994, p. 152/153)
	<u>Demographics</u> Employee's age Employee's education Employee's experience in present position Employee's experience in HRM Employee's experience in organization	No citation available. Findings were all presented by Haines & Petit (1997, in a table (Table 1, p.267))
	<u>Knowledge & skills</u> Analytical skills of corporate staff Employee's understanding of software Employee's understanding of hardware Employee's understanding of programming Employee's computer experience	'..analytical skills of a small group of corporate staff..resulted in better informed policy decisions' - Broderick & Boudreau (1992, p. 500)

	Support & commitment General management support Immediate superior support	'The relationship between support from general management and superior, and user satisfaction..was in the predicted direction but was not significant' - Haines & Petit (1997, p. 268)
	Training Training HR professionals in technical expertise Vendor training College courses In-house training Self-training	'It appeared that more extensive in-house training was accompanied by significantly higher levels of user satisfaction' - Haines & Petit (1997, p. 268)
	User and stakeholder involvement User involvement	'..we found that user involvement in the development and implementation process did not explain user satisfaction ..' - Haines & Petit (1997, p. 268)

Technology factors

The first group of factors we discuss here is related to the applications of the HRIS. Broderick and Boudreau (1992) reported that better informed policy decisions were in part achieved by the availability of tracking applications, which enable reliable tracking of relevant decision making information. Thus, the authors showed that *functionality of an application* could enhance the level of decision making. Furthermore, the authors provided empirical evidence for the use of powerful transaction processing, reporting applications and *widespread availability of the system to employees* to reduce costs and improve accuracy of HR administrative activities. Moreover, the *type of technology used* could also affect HRIS consequences. Broderick and Boudreau (1992) compared mainframe-based and pc-based applications and found that the first group was related to a more centralized HR management and the second to a decentralized HR management. Mainframe applications were standardized and centralized while pc applications were tailored to the individual users pc and thus had low levels of integration with other systems. Thus, according to the results, the technology used had consequences for the amount of integration of systems (Broderick & Boudreau, 1992).

Furthermore, Haines and Petit (1997) investigated the influence of *ease of use* ($r=0,58$; $p<0,001$), *usefulness* ($r=0,47$; $p<0,001$), the use of *online applications* ($r=0,37$; $p<0,001$), the number of *HR applications now running* ($r=0,19$; $p<0,05$) and the number of *HR applications planned* ($r=-0,19$; $p<0,05$) on user satisfaction and discovered that all these relationships were significant. Thus, although none of these factors was significantly related to system usage, they had a clear influence on satisfaction. Except for HR applications planned, all factors were positively correlated with user satisfaction. An explanation for the negative relationship might be that users were less satisfied with their current systems when expecting a new system, which mostly had more sophisticated features.

Moreover, Broderick and Boudreau (1992) showed that *wealth of available information* led to more informed decision making. Additionally, Hannon et al. (1996) reported on the factor *patched updating* as an influence to

certain consequences. The authors investigated the organizational HRIS' status and judged most systems as slow, inflexible and with questionable data quality. Updating HRIS with in-house developed 'patches' was found as the primary cause of these negative characteristics. Finally, Broderick and Boudreau (1992) showed that the *use of a comprehensive database* reduced costs and improved accuracy of administrative tasks. This implies that effectively integrating systems and data are important prerequisites for administering HRIS.

Factors relating to the implementation project were also found in this category. Just as in our previous section the discussion of developing a system in-house versus outsourcing developments showed to affect consequences as well. Hannon et al. (1996) documented positive (reducing costs, focus of HR professionals on core competencies) and negative (organization's dependence on vendors) consequences of outsourcing. Whether in-house- or outsourcing development was more beneficial seemed to be dependent on organizations' needs, future expectations and risk. Decreasing costs and salient positive outcomes of outsourcing were found to increasingly convince decision makers to outsource HRIS development. Additionally, Haines and Petit (1997) examined the relationship between in-house development and user satisfaction and revealed they were unrelated (r=-0,02). The authors did show that quality of *documentation* played an important role in affecting satisfaction (r=0,42; p<0,001). Documentation thus seems to influence system usage as well as satisfaction. Also, support for outsourcing development seems to prevail at the expense of evidence for in-house development. As shown in the previous section, outsourcing can have a positive influence on usage as well.

Organizational factors

As with factors affecting adoption, organizational demographics were insignificant in affecting consequences as well. Haines and Petit (1997) tested correlations between *age of HRIS departments* (r=-0,17), *size of an organization* (r=0,02), *size of HR department* (r=0,06), *size of IS department* (r=-0,09) and *size of HRIS department* (r=-0,00) and user satisfaction and showed insignificant relationships.The same authors also investigated the relation between *computer experience of firm* and user satisfaction and once again found an insignificant correlation (r=0,09) (Haines & Petit, 1997).

Furthermore, *privacy and fairness policies* organizations have in place were reported to impact consequences on a personal level (Eddy et al., 1999). In an experiment on privacy concerns of a hypothetical HRIS with 124 employed persons enrolled in an MBA course Eddy et al. (1999) showed that these policies were important in affecting employee's privacy and fairness perceptions. Organizational policies that provided for employee authorization before releasing personal information had a positive effect on employee's privacy invasiveness and fairness perceptions as opposed to the absence of such policies ($F(1,120)=18,93$; $p<0,001$). The same effect was reported for policies which restricted access to personal information to internal targets only ($F(1,120)=34,18$; $p<0,001$). The two policies were also found to contribute to an interaction effect which positively influenced perceptions as well ($F(1,120)=14,53$; $p<0,001$).

Further, the *degree of centralization of HR management* was shown to affect the integration of subsystems in the sense that more centralized HR management facilitated integration of subsystems (Broderick & Boudreau, 1992). In line with this factor, Hannon et al. (1996) reported that *standardization of HR processes* was an

important factor when implementing an HRIS. They stated that the standardization of processes resulted in comparable data across the organization to satisfy divisional, corporate and governmental reporting.

Concerning the implementation project, Hannon et al. (1996) showed that *identification of current and future organizational needs* was a determining factor. In order to achieve the targeted goals of the HRIS, tailoring the system to the organizational needs was an important prerequisite. The same authors also reported the pursuing of an *integrated HRIS strategy*. Hannon et al. (1996) learned that the corporations under study pursued more integrated HRIS strategies when developing an HRIS by means of aligning the system with business and HR strategies. The ability to plan HRIS developments over the long term was found to positively influence the effectiveness and efficiency of a system. Kossek et al. (1994) revealed that when *HR w*as *a part of the strategic business plan* it positively influenced an implementation process in the direction of strategic benefits, thud pushing results beyond administrative benefits. On the basis of these findings we can say that by strategically planning an HRIS and aligning HRIS strategy with business strategy organizations have a greater chance in achieving more sophisticated HRIS goals.

People factors

Kossek et al. (1994) emphasized that *culture* was the most important factor in achieving strategic HRIS goals. Different units seemed to hold different values regarding the new system. For instance top management showed high resistance to change due to the fact that they did not perceive system usage and gaining knowledge about the system as value adding for their careers. Instead they perceived it as a decrease of HR value since in their view the new system only provided benefits for clerical tasks and not strategic tasks. According to the authors, when cultural values towards the HRIS are not changed for the benefit of the system, organizations will have difficulties to fully grasp the benefits of the HRIS, i.e. achieving more strategic consequences (Kossek et al., 1994).

Haines and Petit (1997) also investigated the effects of individual demographics on user satisfaction and found that *employee's age* (r=-0,07), *education* (r=-0,16), *experience in HRM* (r=-0,13) ad *experience in the organization* (r=0,04) were all insignificant. They only reported one significant negative relationship between *employees experience in the present position* and user satisfaction (r=-0,16; $p<0,05$). The latter could be explained by the fact that the more experienced a person is in his current position, the more familiar he/she is with all practices and the more he/she might resist change (i.e. a new HRIS) than an employee with less experience.

The knowledge and skills of employees in relation to consequences were subject to research as well. *Employee's understanding of software* (r=0,04), *hardware* (r=0,12), *programming* (r=0,12) and *employee's general computer experience* (r=-0,01) were all insignificantly related to user satisfaction (Haines & Petit, 1997). Adversely, Broderick and Boudreau (1992) found that the availability of tracking applications and the *analytical skills of corporate staff* resulted in better informed policy decisions. Thus, although knowledge and skills do not necessarily enhance satisfaction with a system, they are important in achieving certain HRIS goals.

Furthermore, Haines and Petit (1997) were the only researchers investigating the effects of support and found that *general management support* (r=0,15) and *immediate superior support* (r=0,06) did not influence user

satisfaction in a significant way (Haines & Petit, 1997). This is not to say that is not important, since the authors only examine the relationship with satisfaction. As shown in the section on factors affecting adoption, we see that top management support is one of the driving factors behind a successful adoption. More research is needed to determine the effects of support on consequences.

Training was mentioned by several researchers. Although *vendor training* (r=0,11) and *college courses* (r=0,14) are insignificantly related to user satisfaction, *in-house training* (r=0,34; p<0,001) and *self-training* (r=-0,19; p<0,05) did show a significant relationship (Haines & Petit, 1997). Whereas in-house training was found to enhance satisfaction, self-training was found to decrease it. Thus, according to these findings, organizations should train their employees in-house but should not arrange methods for self-training when they are aiming to raise employees' satisfaction with HRIS usage. Training was also reported as important for organizations trying to reach strategic goals with their HRIS. Hannon et al. (1996) outlined the importance of *training HR professionals in technical expertise* by stating that HR professionals were usually able to solve micro-level problems in an HRIS (enter data, edit data or retrieve data) but usually do not possess the skills to use the HRIS for reports or analysis that require a more macro viewpoint. Thus, considering these outcomes, in order to achieve more sophisticated use of a system, training plays a crucial role.

Finally, *user involvement* was mentioned in research by Haines and Petit (1997). However, no significant relationship between user involvement and user satisfaction (r=0,13) was found by the authors.

3.2.5 Towards a framework

In summary, we found an abundance of factors in this decade. One notable difference when comparing research on factors from the 1970's and 1980's to the factors in research of the 1990's is the increase in research on factors affecting consequences, which now comprises 41% of articles (45 of 111) as opposed to 19% in the 70's and 80's. Organizations in the 90's were increasingly convinced of the necessity of an HRIS and therefore research is shifting towards the factors that affect targeted HRIS goals. However, it is still difficult to grasp the most crucial issues for HRIS success due to the limited statistical evidence. Per factor, we mostly found evidence from one publication and in most cases these investigations were case studies as well. However, our primary aim was not to measure strengths of relationships but to find factors which were empirically proven to impact HRIS implementations in a positive or negative way.

Most organizational benefits reported in this decade were found on the operational level, namely: increased accuracy, time savings and cost savings. On the other hand, as mentioned in the introduction for this decade, we also found evidence for an increased role of HR professionals from administrators towards decision support partners, which indicate more strategic outcomes. However, saving time does not directly mean that HR professionals are using this time for more sophisticated ends. Providing time and space to these professionals to engage in more important tasks does not directly transform their roles in the sense that they are viewed as crucial in the eyes of decision makers from other departments and top management. We therefore hitch on to the findings of Kossek et al. (1994) and emphasize the importance of organizational culture. Top management needs to support a cultural change towards an enhanced HR role by means of positioning the HR department central to other departments and engage HR decision makers in strategic planning (see Kossek et al., 1994). In relation to

the latter, we pose that people consequences play a crucial role. It is about the perceptions and attitudes of key decision makers, but also of employees lower down the hierarchy. Cultural changes in the context of IT implementation are especially important during HRIS implementations, due to the great number and diversity of people affected by it (Kossek et al., 1994). Next to culture and attitudes, training is also a significant factor for achieving sophisticated goals. Hannon et al. (1996) emphasized that most HR professionals do not use HRIS to their full potential. Either they are not aware of it or they do not possess the requisite knowledge and skills. Once again, we summarize all our findings from this decade in a contingency model (*Figure 6* and *Figure 7*). *Table 9* outlines all investigated relationships. Due to the great amount of factors leading to implementation consequences we only mention categories and sub-categories.

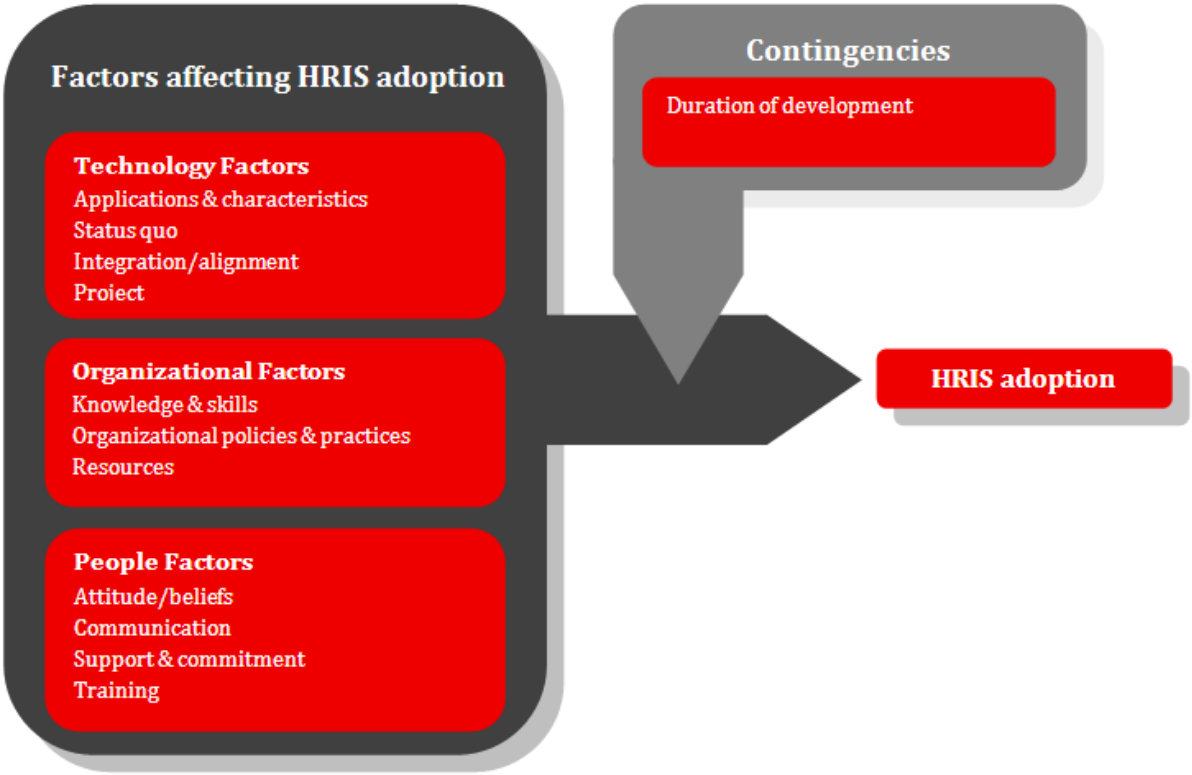

Figure 6: *Contingency model: HRIS adoption in the 90's*

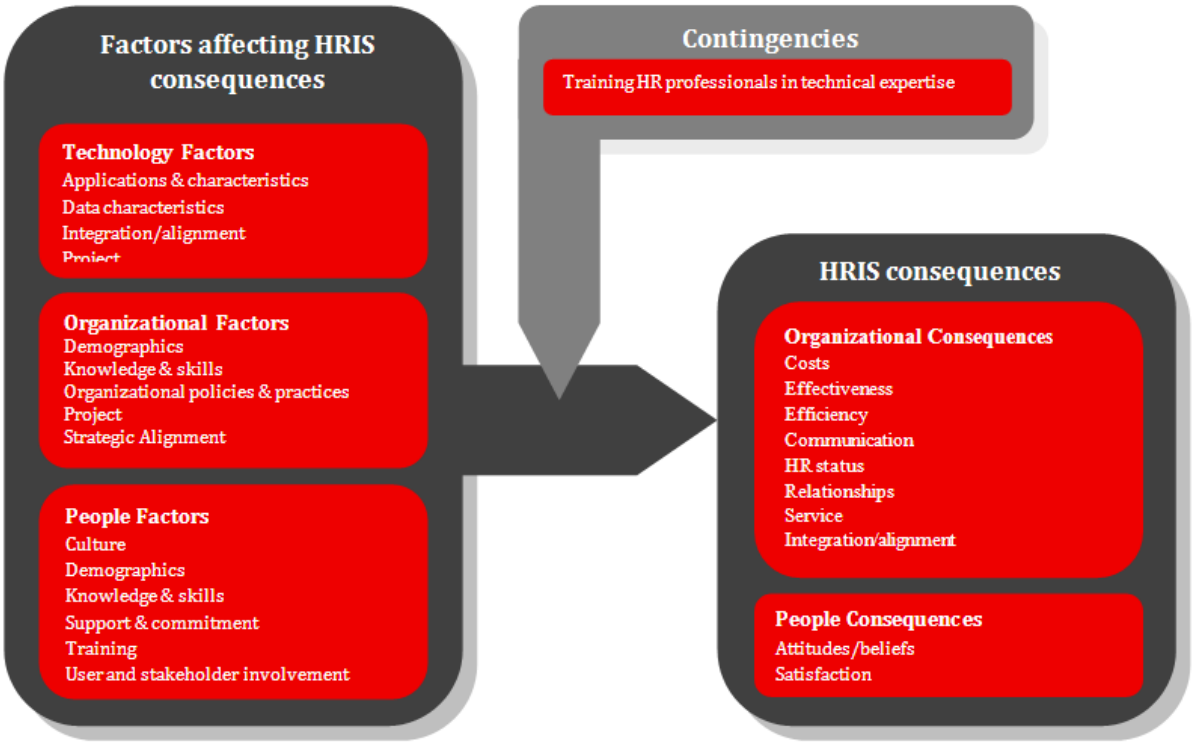

Figure 7: *Contingency model: HRIS consequences in 90's*

Table 9: *Relationships investigated in the literature 1990 -1999*

+ = positive effect, - = negative effect, 0 = no effect

Category	Factor	Consequence
Technology factors	Availability of tracking applications (functionality)	+ Quality of policy decisions
	Widespread availability of the system to employees	+ Cost reductions +Accuracy of HR administrative activities
	Type of technology used (mainframe and pc-based)	+ Centralization of HR management +Amount of systems integration
	Ease of use	+ User satisfaction
	Usefulness	+ User satisfaction
	Use of online applications	+ User satisfaction
	Number of applications now running	+ User satisfaction
	Number° of applications planned	- User satisfaction
	Wealth of available information	+ Decision making
	Patched updating	- Speed HRIS - Flexibility HRIS - Data quality
	Use of comprehensive data base	+ Cost reductions + Accuracy of administrative tasks
	Outsourcing	+Cost reductions + Focus HR professionals on core competencies - Organization's dependence on vendors
	In-house development	0 User satisfaction
	Documentation	+ User satisfaction
Organizational factors	Age of HRIS department	0 User satisfaction
	Organizational size	0 User satisfaction
	Size of HR department	0 User satisfaction
	Size of IS deparment	0 User satisfaction
	Size of HRIS department	0 User satisfaction
	Computer experience of firm	0 User satisfaction
	Privacy & fairness policies	+- Employees' privacy & fairness perceptions

	Degree of centralization of HR management	+ Integration of subsystems
	Standardization of HR processes	+ Degree of data standardization across organization
	Integrated HRIS strategy	+ Effectiveness system + Efficiency system
	HR part of strategic business plan	+ Operational effectiveness + Strategic focus HR
People factors	Organizational culture	+ Strategic HRIS goals
	Employee's age	0 User satisfaction
	Employee's education	0 User satisfaction
	Employee's experience in HRM	0 User satisfaction
	Employee's experience in the organization	0 User satisfaction
	Employee's experience in present position	+ User satisfaction
	Employee's understanding of software	+ User satisfaction
	Employee's understanding of hardware	+ User satisfaction
	Employee's understanding of programming	+ User satisfaction
	Employee's general computer experience	- User satisfaction
	Analytical skills of corporate staff	+ Quality of policy decisions
	General management support	0 User satisfaction
	Immediate superior support	0 User satisfaction
	Vendor training	0 User satisfaction
	College courses	0 User satisfaction
	In-house training	+ User satisfaction
	Self training	- User satisfaction
	Training HR professionals in technical expertise	+ Strategic goals
	User involvement	0 User satisfaction

3.3 Factors and consequences – A review from 2000 – 2010

We found a great increase in articles in this decade. In total, 51 articles were used in our analysis. We proceed each section in the same way as previous decades.

3.3.1 Spirit of the age and nature of the articles

One of the major differences with the earlier articles is that the term e-HRM finally emerged. Before we proceed it is important to establish the difference between HRIS and e-HRM. Ruël et al. (2004) provided us with a very clear distinction. According to the authors, the difference is that HRIS is directed towards improving the processes in the HR department itself, while e-HRM is directed towards people outside the HR department and improving services to them (Ruël et al., 2004). As we have seen in previous decades, HRIS are used primarily to alleviate HR department's administrative burden. e-HRM will thus provide more possibilities for service improvement and role changes for HR professionals. Heikkilä and Smale (2010) adhere to this description and state that e-HRM changes the nature of interactions between HR professionals, line managers and employees from face-to-face to ones that are increasingly mediated by technology.

In line with these developments, research in recent years also shifted from technologies targeting HR staff to technologies aimed at internal customers (Florkowski & Olivas-Luján, 2006). The authors showed that by 2000 the number of applications targeted at internal customers surpassed those targeted at HR staff. Input into the system is thus increasingly provided by internal HR customers, which automatically reduces the administrative burden for HR professionals. This leaves them with more time to spend on other activities.

Not surprisingly, along with a switch from HRIS to e-HRM, we saw an increase in consequences in general and specifically in relational and transformational consequences. Remarkably, the studies were predominantly positive in the sense that almost none describe real failures.

However, contrary to our expectations, statistical studies are still the minority and research is dominated by case studies mostly providing anecdotal evidence.

3.3.2 Consequences of HRIS implementations

In total we found 87 consequences in this decade and used our familiar categorization scheme to organize them *(Table 10).*

Organizational consequences

The first organizational consequence concerns the aspect of *costs*. Numerous authors reported on cost savings as a result of e-HRM implementations (Svoboda & Schröder, 2001; Jones et al., 2001; Chapman & Webster, 2003; Ruël et al, 2004; Buckley et al., 2004; Panayotopoulou et al. 2007; Olivas-Lujan et al., 2007; Beulen, 2009; Oiry, 2009), however Buckley et al. (2004) were the only researchers who underpin their findings with numerical data. In their case study of 14 educational publishers on their introduction of a computerized applicant recruitment and screening system they found that within 3 years ROI was $6 for every $1 spent. Chapman and Webster (2003), in their web-based survey of HR Managers (members of the Society for Human Resource Management (SHRM)) representing 125 organizations in the US on the use of technologies in the recruiting, screening and selection processes for job candidates, stated that cost savings are realized when organizations make the right choices concerning in-house versus outsourcing development of a system. According to the authors, in-house development is only viable when it concerns a large organization. We outline this factor further on. In his survey of 88 Human Resource Directors in Texas city governments in the US on the scope and perception HRIS

effectiveness Reddick (2009) did not find support for operational cost savings and thus counteracts earlier findings. However, this research builds on answers given by HR directors. More hard quantitative data is needed in order to draw solid conclusions.

Further, e-HRM was revealed to enhance *effectiveness of operational HR practices* (Panayotopoulou et al., 2007; Beulen, 2008; Ruta, 2009). This is also called technical HRM effectiveness (Ruël et al., 2007; Haines & Lafleur,

***Table 10**: Consequences of an HRIS implementation 2000 - 2010*

Category	Consequences	Example from literature
Organizational consequences	Operational	
	Costs Cost savings	*'Using the ROI method, the results show substantial cost savings that can be attributable to implementation of the automated system'* - Buckley et al. (2004, p. 238)
	Effectiveness Administration quality Amount of information Information/data quality Information processing capabilities Information autonomy Information responsiveness Effectiveness of HR practices Size of applicant pool Quality of applicant pool Flexibility of HR Applicant cheating	*'This web-based instrument allows for the collection of extensive demographic and job information from users across the world, which otherwise might not be possible'* - Cronin et al. (2006, p. 419)
	Efficiency Time savings Administrative burden HR Efficiency Workload line management Number of employees in HR labor force Productivity Levels of bureaucracy Eliminated paperwork	*'..an investigation that might have taken several hours in the past, can be accomplished in a matter of minutes'* - Neary (2002, p. 497)
	Relational	
	Communication Communication quality Communication platform(online discussions) Employees get informed about organizational developments Employee access to HRM issues	*'Improved communication'* - Ruël et al. (2004, p. 377, Table 3)

	<u>*Relationships*</u> Cooperation Relationship with HR Relationship with upper management Relationship with manager, colleagues and clients Usage of external professional links Internships at other companies Dehumanization of selection process HR staff acceptance Professional standing of HR professionals	*'..the majority of customers felt that their (high) expectations were met and they increasingly thought that their relationship with HR had improved..'* - Alleyne et al. (2007, p. 304)
	<u>*Service*</u> Professional support of faculty and coaches Quality of services to employees Timeliness of services to employees Empowerment of employees and managers to decide on own needs Training and development opportunities Responsiveness to employees' needs HR professionals' focus on functional HR delivery HR professionals' focus on IT support activities Line managers' ability to meet HR responsibilities Support for attention management Support for management effectiveness Support for management decision making	*'..participants reported that the reduction in time spent performing administrative tasks allowed HR personnel to spend more time providing workforce consultation to program managers'* - Cronin et al. (2006, p.419)
	Transformational	
	<u>*HR planning*</u> Turnover Ability to recruit and retain top talent Human resource planning activities Identification of (global) talent Uniformity and completeness in evaluating and managing human capital Company image (employer of choice) Organizational climate Transparency and flexibility of internal labour market Employee development	*'These global applications contribute significantly to the company's retention of its employees'* - Beulen (2009, p. 282)

	Integration/alignment People alignment across subsidiaries Replication capabilities for HR practices Standardization of HR processes Alignment of HR strategy with corporate strategy Alignment of corporate and personal goals	*'Information system alignment positively influences a subsidiary's ability to replicate knowledge'* - Morris et al. (2009, p. 984)
	Knowledge management Knowledge sharing/open culture Knowledge management (creation, capture, transfer, use) Development of intellectual capital Development of employee competence Availability of learning resources Role change for employees involved in training Emergence of 'communities of knowing' Training results Utility for performance appraisal Quality of ratings Participation in performance appraisal	*'Increased knowledge management (creation, capture, transfer, and use of knowledge)'* - Reddick (2009, p. 29, Table 4)
	Strategic focus HR's focus on mission HR's scope directed towards strategic issues HR's competency directed towards business issues Information analysis Strategic conformism	*'..functional specialists appear to be more influenced by IT to spend more time on transformational issues, contributing to the broader strategic issues of the organization'* - Gardner et al. (2003, p. 175)
People consequences	*Attitudes/Beliefs* Extent to which HRIS is seen as a crucial and enabling technology Level of security for ratings Levels of supervisor accountability Employee awareness, appreciation and use of HR programs Invasiveness Role conflicts Extent of human contact Employee commitment	*'HRIS were seen as a crucial and enabling technology by HR professionals'* - Hussain et al. (2007, p. 82)
	Satisfaction Satisfaction with performance appraisal Service satisfaction with HR department Employee satisfaction Satisfaction with HR intranet Client satisfaction with e-HR service	'*High client satisfaction with e-HR service'* - Ruël et al. (2004, p. 377, Table 3)

2008). In his case study of 16 HR executives at Accenture (a global management consulting, technology services, and outsourcing company with 175.000 employees in 49 countries as of 2008) on the way in which HRIS supports their employee retention management Beulen (2009) found that the system enhanced *benefits*

administration. Also, *increases in amount of data, data quality* and *information processing capabilities* were mentioned by a number of scholars. Reddick (2009) reported that data accuracy improves when using e-HRM, while Cronin et al. (2006) conducted interviews with 20 HR professionals working in federal agencies and found *increased information collection and processing capabilities*. Moreover, Gardner et al. (2003), in their survey of 357 HR Professionals and 357 HR Executives on the way the extent of IT usage impacted HR's function, first found an *increased information responsiveness by HR professionals*. This means that by using IT, HR professionals had access to more information and could provide more accurate and timely responses to HR questions by clients. Second, the more extensive the IT usage the *greater information autonomy for HR professionals*. As a result of an increase in clarity and comprehensiveness of HR information, the HR professionals were less dependent on information from clients. Also, the *amount of information* increased as a result of e-HRM (Panayotopoulou et al., 2007; Beulen, 2009).

Using e-HRM in recruitment and selection was found to increase *applicant pool* and increase the *number of minority applicants*, thus positively contributing to diversity policies (Chapman & Webster, 2003). However, e-HRM usage also led to an increase in *under qualified applicants*. When organizations do not anticipate on this outcome, it can negatively impact time savings, since it takes HR staff a lot of time to filter out these applicants and find those with the right qualifications for the job. In the section on factors we discuss what factors to consider in order to mitigate this issue.

Furthermore, e-HRM was reported to *increase operating flexibility* (Reddick, 2009). In his case study of 4 French banking institutions with advanced experience in blended learning (e-learning and face-2-face training) Oiry (2009) reported that e-learning led to *training flexibility* since employees could choose their own moment in time to train themselves. Ruël et al. (2004) conducted case study research in 5 large organizations (>15.000 employees) and found that e-HRM stimulated *flexibility over bureaucracy*, which could enhance responsiveness from the HR department.

One negative consequence of using e-HRM in recruitment and selection was presented in the form of *applicant cheating* (Chapman & Webster, 2003). The authors stated that when organizations administer an assessment test via the internet it is very hard for them to determine whether it is really the applicant filling in the test. Other cheating issues were found in the form of competitors trying to copy the selection tools available on the internet. On the basis of these findings we can say organizations should be aware of these threats and decide upon how to use e-HRM for recruitment and selection purposes. For instance, it is recommendable to let an applicant fill in a small test online and do the real assessment test on location at the company.

Traditionally, e-HRM was promised to lead to efficiency gains. We found support for this promise. In a case study of 16 HR executives at Accenture (a global management consulting, technology services, and outsourcing company with 175.000 in 49 countries) on the way in which HRIS supports them in their HR tasks, Beulen (2008) found that use of manager self-service applications *increased efficiency*. Additionally, in his case description of a large US-based multinational company active in automotive, aeronautical systems, space and electronics, and information systems on the development of a uniform performance appraisal and management system Neary (2002) showed that *time savings* were a consequence of e-HRM. The findings were also confirmed

by Cronin et al. (2006) and Panayotopoulou et al. (2007). The last authors reported their findings of a mixed method research on e-HRM adoption in Greece by means of 76 questionnaires administered to HR managers and focus groups with 3 HR managers from 3 different sectors: manufacturing, banking, telecommunications.

Efficiency gains were also found in the form of a decrease in *administrative burden* (Ruël et al., 2004; Reddick, 2009). Reddick (2009) further reported that he did not find support for an increased *volume of work*. Moreover, Bell et al. (2006), in their interviews with HR representatives from 19 Fortune 500 companies to examine the linkage between electronic human resources (e-HR) and the reshaping of professional competence in HRM, reported that *HR professionals' administrative competency* was of less importance since the introduction of e-HRM. Finally, overall *operating efficiency* (Reddick, 2009) increased and e-HRM in recruitment and selection led to a more *efficient screening process* (Chapman & Webster, 2003; Buckley et al., 2004).

One important discussion within e-HRM research and practice is the expectation that e-HRM might on the one hand decrease administrative burden for the HR professionals, while on the other hand increasing the burden of line managers. Reddick (2009) investigated this issue and found no support for an increased *workload for line managers*. However, in their case study of an e-HR implementation in two strategic business units of a UK-based leading global oilfield services provider, Martin and Reddington (2010) surveyed and interviewed line managers of the two subsidiaries. They found that line managers experienced an increase in workload following from the implementation of an e-HR system. The counteracting findings can be explained by the sample used by the authors. Reddick (2009) interviewed HR directors, while Martin and Reddington (2010) surveyed and interviewed line managers themselves. Other type of research, like for instance a longitudinal observation or quantitative measurement of line managers from before and after the implementation of e-HRM, could provide more objective results.

Reddick (2009) also found the *productivity of employees* to increase as a result of e-HRM. However, the author did not find support for *reduced HR labor force*, *reduced levels of bureaucracy* and *elimination of paperwork*. As an explanation for the fact that HR labor force stayed practically the same we propose that HR professionals could be used for more sophisticated purposes once their administrative tasks diminished. Further, while e-HRM has probably the potential to reduce bureaucracy, the necessary organizational policies and processes also need to be in place to realize this potential. The same holds true for the amount of paperwork. When the e-HRM application offers, at minimum, the same functionality as paper forms, the organization needs to have rules in place which stipulate employees can only use the e-HRM application instead of paper versions.

Furthermore, e-HRM was found to affect communication within an organization. Ruël et al. (2004) and Panayotopoulou et al. (2007) reported an *improved communication*. Employees were getting *better informed about organizational developments* since they could take part in online discussions (Ruël et al., 2004), and had *better access to HRM issues* (Panayotopoulou et al., 2007).

Moreover, we found in the literature that relationships within the organization and between the organization and outside suppliers, clients and partners were affected by e-HRM. Panayotopoulou et al. (2007) reported on *improved cooperation* with HR. In their case study of HR managers and customers of a customer services division of a large subsidiary of a major telecommunications organization which had developed and

implemented a company-wide HR intranet Alleyne et al. (2007) found that e-HRM led to *improved relationship with HR*. Also, *improved working relationships with upper management* , *improved relationships with clients and business and HR* and *received HR staff acceptance* (Reddick, 2009) were mentioned. Additionally, Gardner et al. (2003) report that *HR professionals made greater use of external professional links* which kept them more up-to-date on recent developments in the field and allowed them to build and maintain networks, which could also result in a more innovative HR department. In their case description of Deutsche Bank's organization-wide effort to transform the HR department into a strategic partner Svoboda and Schröder (2001) reported on the fact that *employees started more internships at other companies* as a result of e-HRM and that e-HRM *enhanced employees' team spirit*.

Finally, Hussain et al. (2007) conducted a survey of 101 HR professionals and interviews with 11 senior executives (to whom the HR professionals reported) working in small-and-medium sized and large UK organizations and found strategic use of e-HRM within the HR department led to an *enhanced professional standing of HR professionals within their organizations* as seen by the HR professionals themselves ($p<0,001$) and as perceived by the organization ($p<0,001$). However, data from the interviews with HR executives revealed that HRIS use had not enhanced professional standing within the organization but had done so in the professional at large. The authors state that this contradiction may be a consequence of the persisting view that HR is little value-adding to the company's bottom line.

We also found e-HRM to negatively impact relationships. For instance Oiry (2009) presented findings that show that e-learning can lead to a *deterioration of the relationship with manager, colleagues and clients*. This was caused by a discrepancy between the way the employee is viewed in the eyes of his direct managers and the way the employee views himself. While the employee saw himself as 'in training' when using the e-learning application at his workplace, the manager saw the employee as generally 'at work'. This then caused friction between employees and managers. The authors further showed that organizations mitigated this issue by providing different locations for e-learning not far from their working place. Unfortunately, this then had negative consequences for the flexibility of the systems. Organizations thus need to balance the trade-offs in the most optimal way. Moreover, Chapman and Webster (2003) reported on the *dehumanization of the selection process* but did not find support for this outcome.

The improved relationships and communication mentioned above is related to the service provided by the HR department. e-HRM was also found to directly impact service provision, in these sense that *HR professionals spent more time providing workforce consultation* (Bell et al., 2006; Cronin et al., 2006) and e-HRM *increased HR's responsiveness to employees needs* (Cronin et al., 2006). Additionally, Reddick (2009) reported that e-HRM led to *improved quality and timeliness of services to employees and clients*. His findings were confirmed by Panayotopoulou et al. (2007). Olivas-Luján et al. (2007), in their case studies of 4 large Mexican owned firms from 4 different sectors (food and beverages, financial and commercial services, production and distribution of construction materials, information technology and BPO(business process outsourcing)), also revealed that e-HRM resulted in faster responses from HR department. It thus seems that the time HR professionals saved as a result of automating administrative activities allowed them to increase their quality of service towards their clients.

The literature also showed that e-HRM directly served HR clients. Research by Svoboda and Schröder on e-learning reported that e-HRM provided *professional support of faculty and coaches* (Svoboda & Schröder, 2001). Moreover, it *improved training and development opportunities* (Beulen, 2009), *empowered employees and managers to make more decisions on their own about their needs, enabled managers to be more effective* and *improved line managers' ability to meet HR responsibilities* (Reddick, 2009). Moreover, e-HRM was found to *increase managers' decision making* as a result of the increased information provision (Panayotopoulou et al., 2007; Beulen, 2008). Further, in his case study of Gama, a world leader in his business market, Guechtouli (2010) investigated the way an IT system supported the company manager's environmental scanning procedures. Environmental scanning was defined as the acquisition and use of information from an organization's environment. Since people are naturally limited in their information processing capabilities, an IT system can be used as a filter to allow relevant information only to arrive at decision makers. The author investigated an application in Gama's intranet called 'the Weekly' and found that it provided good *support for attention management* since information could be filtered by employees in order to relief the amount of information reaching the managers. Finally, Gardner et al. (2003) reported that HR professionals *spent more time on IT supporting activities* after an organization implemented e-HRM. This asked for additional knowledge and skills from the HR professionals. A factor we will discuss further on.

Research also showed that e-HRM facilitated a *strategic reorientation of HR professionals* (Reddick, 2009; Bell et al., 2006; Panayotopoulou et al., 2007; Olivas-Luján et al., 2007; Olivas-Luján et al., 2007) . Thus, HR professionals were found to spend more time on transformational activities (Gardner et al, 2003) and could *focus more on their mission* (Reddick, 2009). This meant that HR professionals were more engaged in organizational change activities, were increasingly seen as business partners (Haines & Lafleur, 2008) and their *competency was increasingly directed towards business issues* (Bell et al., 2006). Haines and Lafleur arrived at their findings by means of survey research of 210 senior HR executives at leading Canadian corporations. Other strategic issues e-HRM was found to support were risk taking (Ruël et al., 2004), innovation (Ruël et al., 2004) and environmental scanning activities (Guechtouli, 2010). As mentioned earlier, environmental scanning was enhanced as a result of filtering out relevant information by means of the HR system. Additionally, e-HRM also enabled to implement HR strategic decisions very rapidly (Cronin et al., 2006).

HR professionals' strategic orientation can be explained in light of the time savings and the increased amount of information and ways in which the information could be used for strategic decision making. For instance, Ball (2001), in her survey of 115 organizations from the Financial Analysis Made Easy (FAME) database into their usage of HRIS applications for different HR activities, revealed that especially large organizations used information from an HRIS for sophisticated information analysis. Thus the information was used for more strategic decision making.

Some research does not support a strategic reorientation of the HR department. In their case study of a large UK engineering company (40.000 employees) implementing the HRIS element of an ERP system for the purpose of transforming the HR department to a strategic partner, Tansley et al. (2001) found that the implementation did not lead to change in responsibilities and roles to be more strategic for HR specialists and employees in general. Several factors contributed to the failure to achieve these strategic goals. We will outline them in a later section.

Another finding by Guechtouli (2010) illustrated a negative consequence of pointing all heads in the same strategic direction. In his study a potential downfall was found in the form of *strategic conformism* whereby employees only posted information for the managers that were in line with the organization's current goals, thus missing out on opportunities going beyond the scope of an organization's current strategy. However, as we will outline further on, culture plays an important role in mitigating this outcome.

e-HRM was further found to *positively affect HR planning activities* (Beulen, 2009). Additionally, this was presented in the form of *reduced turnover*(Buckley et al., 2004) and an *increased ability to retain employees* (Panayotopoulou et al., 2007; Beulen, 2009). Accordingly, Reddick (2009) showed that e-HRM increases organizations' *ability to recruit and retain top talent*. Employee attraction and retention was even indirectly influenced by e-HRM, since e-HRM was reported to *positively affect company image* as an 'employer of choice'. Literature shows that organizations using the latest technology were viewed as modern and progressive by talents (Panayotopoulou et al., 2007). In light of these findings, Ruël et al. (2004) reported on an *organizational climate change* directed more towards flexibility and better work-life balance as a result of e-HRM, which also contributed to attracting and retaining talented employees.

Concerning development of employees the results showed that e-HRM *enhanced employee development* (Panayotopoulou et al., 2007). Ruël et al. (2004) reported on the finding that e-HRM enabled *employees to choose their own development path*, which could increase the above mentioned company image as well. Enhanced development could be explained by the fact that e-HRM led to *uniformity and completeness in evaluating and managing human capital* (Neary, 2002). For large or global companies, the data showed that e-HRM provided for a *transparent and flexible internal labor market* (Ruël et al., 2004) and it facilitated *identification of (global) company talent* (Neary, 2002). Thus, according to these findings, in the case of employee planning e-HRM played an instrumental role in storing, aligning and managing employee data while simultaneously providing a flexible platform for employees to fulfill their own training and development needs.

Furthermore, our review brought up evidence showing that e-HRM facilitated *integration of HR strategy with company strategy* (Ruël et al., 2004; Panayotopoulou et al., 2007). The strategic integration of HRM with the company strategy, structure and culture is achieved through e-HRM by on the one hand centralizing and standardizing HR-policies and practices and on the other decentralizing their execution (to line management and employees) (Ruël et al., 2004). *Standardization of HR processes* as an outcome of e-HRM was also found by Cronin et al. (2006), thus supporting the finding that e-HRM contributes to strategic alignment.

In their case study of HR unit managers of 20 MNCs and their survey of 263 HR managers Morris et al. (2009) investigated if the alignment of formal HR processes, informal people alignment and information system alignment contributed to a subsidiary's replication capability. The latter referred to the extent to which subsidiaries were able to replicate HR practices from headquarters. The authors found that IS alignment significantly contributed to *replication capability* ($r=0,22$; $p<0.05$). It did not however contribute to *people alignment* ($r=-0,7$). The authors explained this by saying that effective IS in HR make the need for aligning people less necessary. Next to aligning strategies, e-HRM was found to facilitate *alignment of personal goals*

with strategic goals (Panayotopoulou et al., 2007). This was connected to the earlier finding that e-HRM enables employees to choose their own development path within an organization.

Concerning knowledge within the organization we found support for *increased knowledge management* in the form of creation, capture, transfer and use (Reddick, 2009). Further, e-HRM was found to enhance the *development and maintenance of intellectual capital* (Ruta, 2009) and *realized a growth of employee competence* (Ruël et al., 2004). Ruta (2009) came to his findings by conducting a case study at a leading international consulting firm on the implementation of an advanced HR portal and the way it contributed to intellectual capital creation, maintenance and leverage. He further revealed that this portal contributed to a *knowledge-sharing culture* (Ruta, 2009). A finding also supported by Ruël et al. (2004), who reported on a *more open culture* as the result of the implementation of an HR system. Hustad and Munkvold (2005), in their case study at Ericsson on the implementation of an IT-supported competence management system, found the *emergence of communities of knowing* as a consequence of this system. By using the system, employees became aware of other employees in the company with similar knowledge. Consequently, a number of employees regularly engaged in such communities.

In their case description of Deutsche Bank Svoboda and Schröder (2001) also reported evidence for *globally available resources for learning*. This is related to the above mentioned evidence for the standardization of HR processes and practices as a consequence of e-HRM. We therefore pose that organizations which act globally may have good reasons for implementing an HR system. Moreover, Oiry (2009), on his study on e-learning, found that it led to *better training results*. This was a result of the possibility to customize training material to the level of the trainee. Also, the use of e-learning resulted in a *change in roles* of all those involved in training. For instance, trainers needed to be competent project managers since they had to be able to get IT people, graphic designers and pedagogical experts to work together to create e-learning content.

Finally, in their quasi-experimental study on employee's reactions to the use of an online performance appraisal (PA) system and the traditional paper-and-pencil (P&P) approach Payne et al. (2009) compared reactions of a group of 83 employees evaluated with the P&P approach and 152 employees evaluated with the online system. Contrary to the expectations of the authors, P&P respondents reported *higher quality of ratings* than the ones evaluated by the online version ($F(1,158)=8,04$; $p<0,05$). Despite the fact that employees rated by the online application reported higher levels of utility, the difference between the levels of *utility for the performance appraisal*, or the extent to which the employee learned valuable information from the evaluation, was also insignificant ($F(1,158)=0,89$; $p>0,05$). Finally, online employees reported significantly higher levels of *participation in the performance appraisal* than P&P employees ($F(1,158)=9,50$; $p<0,05$). Thus, most differences were found to be insignificant, which means that rating employees by means of e-HRM will approximately yield similar results. However, more objective ratings of the constructs investigated need to be considered in order to draw well-grounded conclusions. The fact that employees themselves were the respondents might be a bias to the research.

People consequences

Most people consequences we derived from literature concern impacts on attitudes and beliefs of users. Hussain et al. (2007) found positive attitudes towards e-HRM in the form of HR professionals who saw *e-HRM as a crucial and an enabling technology*. E-HRM was also reported to *improve employee awareness, appreciation and use of HR programs* (Reddick, 2009) and *increase employee commitment* (Olivas-Luján et al., 2007).
The results of the earlier mentioned research by Payne et al. (2009) show that *levels of supervisor accountability*, or the supervisor being required to give feedback and/or justify performance appraisal ratings, were significantly higher for the 'online employees' than for the P&P employees ($F(1,158)=8,36$; $p<0,05$). Further, both groups reported approximately the same *level of security for ratings* ($F(1,158=0,01$; $p>0,05$). Thus, supervisors were seen as more accountable when using the computer system and the appraisal via computer system was seen as secure as the paper and pencil version. Perceptions of *invasiveness* was another outcome investigated by Lukaszewski et al. (2008) in their experiments on the effects of ability to choose the type of HR system (real-life vs. digital) to which data would be disclosed (choice vs. no choice), and type of information disclosed (medical vs. non-medical). We outline these relationships in our section on factors.

Oiry (2009) reported on negative people outcomes of e-learning. A negative consequence was the a *lack of human contact* which could be detrimental for the learning process. Therefore, the organizations under investigation engaged in blended learning or a combination of e-learning and face-to-face learning. However, a problem with blended learning, and especially with the e-learning part, was the fact that it could lead to *role conflicts*. As mentioned earlier, the employee saw himself as 'in training' when using the e-learning application on his workplace, while the manager saw the employee as generally 'at work', which caused the role conflicts. Organizations mitigated this issue by providing a different e-learning location than the employee's regular working place.

e-HRM was further reported as *beneficial to employee satisfaction* (Panayotopoulou et al., 2007). Our review also showed an *increased service satisfaction with the HR department* (Lukaszewski et al., 2008) and *increased satisfaction related to HR processes* as a result of the earlier mentioned better HR responsiveness to employees' needs (Cronin et al., 2006). The findings of Alleyne et al. (2007) revealed a *high client (managers and other HR customers)satisfaction with the HR intranet*. The same holds for Ruël et al. (2004), who found *high client satisfaction with overall e-HR service*. Payne et al. (2009) compared computerized performance appraisal with traditional (paper and pencil) appraisal and reported that employees which were evaluated by means of a computerized system did not differ in *satisfaction with the performance appraisal* than employees evaluated by means of paper and pencil ($F(1,158)=0,86$; $p>0,05$). In summary, most authors report positive findings regarding satisfaction. Clearly, earlier mentioned organizational benefits are also noticeable on individual levels.

3.3.3 Factors affecting e-HRM adoption

We found 77 factors affecting the adoption of e-HRM *(Table 11)* and once again categorized them as *technology, organizational, people* and *environmental factors.*

Technology factors

Factors relating to the applications and characteristics of the applications were also found in this decade. Ruël et al. (2004) reported that without a *clear and easy structure of information* employees and line management were afraid of spending time in exploring the e-HR tools. In his survey research of 110 organizations in Singapore Teo et al. (2007) tested a number of factors on their influence on adoption of an HRIS, and found *departmental relative advantage* as a significant factor affecting an organizations' adoption of a system (F= 7.927; p=0,006). Relative advantage was defined as the benefits an HRIS brings to either the department or the organization as a whole. Furthermore, *experienced usability* was also reported to significantly impact attitude towards e-HRM (β=0,21; p<0,01). When taking into account the different participants, namely managers and shop-floor employees we saw that *experienced usability* was significant for shop-floor employees (β=0,21; p<0,01). *Experienced ease of use* was, however, not found to be significant (Voermans & van Veldhoven, 2007).The authors reported their findings on the basis of an online questionnaire research of 99 managers and 257 employees within Philips (Electronics) Netherlands.

In his survey of 60 Malaysian employees in manufacturing SME's(<250 employees) Hooi (2006) showed that *IT infrastructure* was an important factor in considering the adoption of e-HRM. Furthermore, Reddick (2009) found that

Table 11: *Factors affecting e-HRM adoption 2000 - 2010*

Category	Factors	Example from literature
Technology factors	<u>*Applications & Characteristics*</u> Clearness of information structure Experienced usability Experienced ease of use Departmental relative advantage	*'..employee attitude towards E-HRM is influenced by multiple factors. In this research, two main factors were found to improve this attitude: first, positive experiences with an IT system (especially its experienced usability)..'* - Voermans & van Veldhoven (2007, p. 899)
	<u>*Status quo*</u> Technical/IT infrastructure	*'Technical infrastructure not in place (as success factor)'* - Reddick (2009, p.31, Table 5)
	<u>*Integration/alignment*</u> Compatibility of HRIS Language standardization Integrating vendor software with in-house software Developing customized system content	*'Compatibility was found to influence the decision to adopt HRIS'* - Teo et al. (2007, p. 58)
	<u>*Project*</u> Outside vendor Availability of pc's	'The availability of PC's in all 'corners' of the company.. are important requisites for the success of e-HRM' - Ruël et al. (2004, p. 376)
Organizational factors	<u>*Demographics*</u> Organizational size Sector	*'Another critical success factor (in e-HR adoption) was the banking sector's characteristics and culture'* - Panayotopoulou et al. (2007, p. 288)

	Organizational branch	
	<u>*Knowledge & skills*</u> HRIS expertise HR's IT absorbative capacity Expertise in IT Change management Language capabilities of employees	*'HRIS expertise is another significant factor influencing the decision to adopt HRIS'* - Teo et al. (2007, p. 58)
	<u>*Organizational policies & practices*</u> Guaranteeing confidentiality and security of input data Work organization Employment structure (insignificant) Configuration of HRM HR ICT governance	*'The configuration of HRM (H6) does generally influence e-HRM adoption, since institutionalization, comprehensiveness and in particular strategy prove to be significant for adoption'* - Strohmeier & Kabst (2009, p. 494)
	<u>*Project*</u> Mapping HR processes Ability to prove need or potential pay-back Identification of HR needs Cross-functional project team Project in hands of HR Clear e-HRM goals and planning Internal marketing of system/Constant communication processes Collaboration between departments (especially HR and IT) Developing shared vision between HR and IS manager Consulting external advisor	*'..preparing staff through marketing efforts.. is a critical component of system success since these efforts increase user 'buy-in' and system usability'* - Cronin et al. (2006, p. 422)
	<u>*Resources*</u> Financial resources	*'..one of the main constraints of implementing e-HRM is the element of cost'* - Hooi (2006, p. 477)
People factors	<u>*Communication*</u> Communicating about intended HRIS use Consultation about implications of new system	'The application now functions well, but it had a difficult start because its intended use had not been well communicated about' - Beulen (2009, p. 282)
	<u>*Culture*</u> Organizational culture Organization's subjective norms HR innovation climate	*'The survey results identified four factors with relation to the adoption of corporate websites for recruitment – these have been named subjective norms,,'* - Parry & Wilson (2008, p. 666)
	<u>*Demographics*</u> Age (insignificant) Gender (insignificant) Job experience (in years)	*'Regarding organizational demography (H3) age, gender, and education do not influence adoption'* - Strohmeier & Kabst (2009, p. 492)

	(insignificant) Education (insignificant)	
	<u>*Knowledge & skills*</u> PC skills of management and employees HR professionals' IT skills Knowledge of IT (insignificant) Individual IT competencies Employee's knowledge of languages	*'All participants indicated..individual IT competencies as critical success factors for e-HR adoption and use'* - Panayotopoulou et al. (2007, p. 287)
	<u>*Leadership*</u> Visonary, supporting and encouring leader Presence of system champion/advocate Supportive leader with change management skills	*'For line managers, the results showed that, as predicted, this group was receptive to change and the introduction of the new HRISs where the leader was supportive and effective in change leadership'* - Wilson-Evered & Härtel (2009, p. 381)
	<u>*Psychological factors*</u> Trust between members of project team Mindset of line management and employees towards e-HRM Strategic HR preference Employee champion preference Administrative expert preference (insignificant) Beliefs about relative advantage of e-HRM Resistance to change Security and privacy fears Group morale Workplace distress (stress) Confidence with technology skills Job satisfaction Perceptions of HR staff	*'The level of job satisfaction had a significant positive relationship with attitudes towards new ideas (in this case: a new HRIS)'* - Wilson-Evered & Härtel (2009, p. 381)
	<u>*Support & commitment*</u> Commitment from management Commitment from employees Top management priority Top and line management commitment towards e-HRM strategy Top management support Experienced user support	*'..as adopting the HRIS may have significant impact on work practices, top management support is crucial to overcome possible internal resistance to the adoption of HRIS and ensure successful implementation'* - Teo et al. (2007, p. 58)
	<u>*Training*</u> Training of HR professionals Manager training Employee training	*'Manager and HR training is another important aspect of the system success.. training is another way to increase buy-in and reduce apprehension related to the new system'* - Cronin et al. (2006, p. 420)

	<u>*User/stakeholder involvement*</u> Involvement of HR specialists Involvement of IS specialists Involvement of subject matter experts	*'It is critical that job incumbents or other types of Subject Matter Experts (SME) are involved in the creation of this content (of HR system)'* - Cronin et al. (2006, p. 419)
Environmental factors	<u>*Union presence*</u> Union presence	No citation available. Result is presented in table (Haines & Lafleur, 2008, Table 1)
	<u>*Country economic development*</u> Country's economic development	*'..Eastern business systems accordingly show high adoption rates (as opposed to Western systems)* - Strohmeier & Kabst (2009, p. 495)
	<u>*Country culture*</u> Country culture	*'The different stages of e-HRM adoption between the four cases presented illustrate distinctive influences stemming from Mexico's..culture'* - Olivas-Luján et al. 2007, p. 430)

when a *technical infrastructure was not in place* it seriously hindered e-HRM adoption. Considering these findings, it is obvious that organizations need to have the right infrastructure in place in order to consider implementation of e-HRM.

Related to the previous factors, results also indicated the *compatibility of e-HRM* with the systems already in place as an important factor (Teo et al., 2007). Additionally, Chapman and Webster (2003) reported that *problems with integrating vendor software with in-house software* pose a serious limitation on the e-HRM implementation. Furthermore, in their survey of 439 UK HR managers and directors Parry & Wilson (2009) investigated which factors were associated with the adoption of online recruitment tools such as the corporate website or commercial job boards. Specifically they investigated factors derived from the theory of planned behavior (Ajzen, 1991) and the theory of diffusion of innovations (Rogers, 1995) and found that the percentage of vacancies advertised via commercial job board was influenced by *internal compatibility* β=0,206;t=3,397;p=0,001). Internal compatibility was not found to influence vacancies advertised via the corporate website (β=0,034;t=0,657;p=0,512). Internal compatibility was defined as the degree to which an innovation is perceived as consistent with existing values, past experiences and needs of potential adopters.

Concerning integration and alignment, Heikkilä and Smale (2011) conducted 18 in depth-interviews with subsidiary HR managers from 2 European MNCs on the effects of *language standardization* on the acceptance and use of e-HRM systems and reported that it could have either positive or negative effects depending on the *language capabilities of employees*. Dysfunctional effects were found in the form of ad hoc usage of an old system and resistance to the new system. We therefore pose it is only recommendable to use one universal language when all users are familiar with that language. Also of importance was *developing customized system content* (Cronin et al., (2006). The authors found that this factor contributed to the adoption of a system since employees will work with the system to a greater extent when it fits their specific needs.

Concerning the implementation project Ruël et al. (2004) revealed that the *availability of pc's* was an important success factor. Although this finding might seem straightforward, employees working in production mostly do not have a personal computer. In this case, organizations need to be more creative in order to reap the benefits of e-HRM, like for instance placing PC's in every department and allowing employees time to fill in their personal forms.

Organizational factors

Organizational demographics were found to play a role in these decades as well. *Organizational size* was the most frequently mentioned demographic affecting adoption. In their survey of 147 HR practitioners in Hong Kong Ngai and Wat (2006) reported that *organizational size* was a significant factor in the adoption of an HRIS, whereby larger companies were more likely to adopt a system (χ^2=52,987; p=0,00). Also, Strohmeier and Kabst (2009) examined which general and contextual factors influence cross-national organizational adoption of e-HRM by means of a survey of senior HR managers in 2336 organizations in 23 European countries and found that *organizational size* significantly affected e-HRM adoption in the sense that larger companies were earlier adopters (β=0,332 ;p<0,001). Additionally, Teo et al. (2007) described the same finding (F= 35.746; p=0,000). Thus, on the basis of these findings we can say that adoption is more widespread among large organizations. However, Chapman and Webster (2003) revealed that successful adoption was more widespread among small organizations. The results suggested that integration with large existing systems that are difficult and expensive to modify may be one contributing factor to this effect. However, more research is needed to discover which factors mediate or moderate the relationship between size and success. Important to note is that in the study by Chapman and Webster *organizational size* was also found as a contingency factor for the decision of developing software in-house or buying off-the shelf applications, whereby smaller organizations could gain more profit from off-the-shelf applications. For large organizations it was important to determine whether existing systems are hard to modify, and if so, they could be more successful when developing a system in-house.

Sector played a role in the adoption of systems as well. Olivas-Luján et al. (2007), in their study on 4 large Mexican owned firms from 4 different sectors (food and beverages, financial and commercial services, production and distribution of construction materials, information technology and BPO(business process outsourcing)) reported that from the investigated sectors, the banking industry was the most advanced in e-HRM adoption. This was caused by the fact that large banks also operate internationally. Strohmeier and Kabst (2009) also outlined that the banking sector was positively related to adoption (β=0,347 ;p<0,05) whereas the building sector (β =-0,543 ;p<0,05) was negatively related. The sectors public (β=0,219) , agriculture (β=-0,308), manufacturing (β=-0,210), retail (β=(-0,460) and other sector (β=0,321) did not yield significant results. Further, the findings by Panayotopoulou et al. (2007) showed that sector and sector characteristics, such as sector culture towards technology, affected adoption of e-HRM. For instance, the telecommunications sector was found as more technology friendly than the manufacturing sector (Panayotopoulou et al., 2007). Next to sector, *organizational branch* was also reported to significantly affect attitudes towards e-HRM (β=0,15; p<0,01), specifically for employees (β=0,19; p<0,01).

Furthermore, an organization's knowledge and skills were revealed as important aspects for adoption. Teo et al. (2007) mentioned *HRIS expertise* as significant influence on adoption (F= 7.911; p=0,006). *General expertise in IT* was also found to impact the adoption of a system (Hooi, 2006). In their web-based survey of 136 US and Canadian firms on the influence of HR IT governance arrangements regarding intensity of e-HRM usage, Olivas-Luján and Florkowski (2010) revealed that *HR's IT absorptive capacity* (i.e. the ability of a firms employees to develop relevant knowledge bases, recognize valuable external information, make appropriate decisions and implement effective work processes and structures (Cohen & Levinthal, 1990. p. 267)), was associated with the presence of an HR technology champion and human resource technology intensity only when the responsibility for the HR system (IT governance) was, among other departments, in the hands of the IS department as well. In short, HR's IT absorptive capacity was thus found to indirectly influence the intensity of IT. We outline the importance of a technology champion further on. Moreover, Reddick (2009) revealed that the *change management skills* available in an organization were a barrier to HRIS adoption. As we showed in previous chapters, the implementation of HRIS mostly required employees and managers to change their current ways of working. We therefore pose that adequate change management skills can make a difference in whether employees will adopt these new ways or resist it. Finally, concerning the above mentioned language standardization, an important contingency factor which influences the effects of this standardization was *employees' knowledge of languages* (Heikkilä and Smale, 2011). Thus, these findings show that depending on employees' knowledge level of the language in which the system is standardized, organizations can expect positive or negative effects for adoption.

Concerning organizational policies and practices Ruël et al. (2004) found *guaranteeing confidentiality and security of input data* as an important factor for employees to feel comfortable when using a system. Further, Strohmeier and Kabst (2009) reported that *work organization* was significant for adoption in the sense that organizations who engaged more in telecommuting significantly adopted e-HRM (β=0,388; p<0,001). Also, *configuration of HRM* (i.e. the extent of institutionalization or existence of a formal (strategic) HR department) was found to significantly affect adoption (β=0,335; p<0,05). On the other hand, *employment structure* (the extent to which organizations used temporary or fixed personnel) was not reported as a significant factor (β=-0,022). Moreover, as mentioned earlier, *HR IT governance* mediated the relationship between HR function factors (the previously mentioned HR's IT absorptive capacity and HR innovation climate we discuss later on) and organization's intensity of HR technology and the presence of system champions whereby it positively mediated the relationship when HR IT governance included the IS department as well (Olivas-Luján & Florkowski, 2010).

Factors regarding the e-HRM implementation project were also found in this decade. In their 2 year ethnographic case study (observations, 10 interviews, document analysis and field notes) of HR and IS managers working on a three year global HRIS project for an American corporation, Tansley and Watson (2000) reported that several factors influenced the success of the e-HRM project, such as the use of a *cross-functional project team* with representatives from HR and IS, the *mapping of HR processes* and *identification of HR needs* by means of a gap analysis. The fact that the *project* was *in hands of the HR department* was revealed as an important factor as well, since they were the ones with knowledge of HR processes. The organization also *consulted external*

advisors to decide upon an outside vendor, since they did not have the necessary expertise in-house. As mentioned in their paper: the implementation should be termed an HR rather than an IT project. Furthermore, *clear e-HRM goals and careful planning of goals* were found of paramount importance in convincing users of the usefulness of e-HRM and thus the adoption of it (Ruël et al. 2004). Panayotopoulou et al. (2007) supported the findings of Tansley and Watson (2000) in the sense that they emphasized the importance of thorough *collaboration between departments (especially between HR and IT departments)* for the success of an implementation. Related to the latter is *developing a shared vision between HR and IS managers* as reported by Tansley and Newell (2007). They outlined findings of an ethnographic narrative study of an IS and HR manager working in a North-American owned corporation of over 80.000 employees during the agenda setting stage of a global HRIS implementation, whereby the managers emphasized the importance of this shared vision for stimulating collaborative leadership during implementation and the success of an adoption. As their results showed, development of a shared vision could be facilitated through meetings where there was given room for introduction of each others' viewpoints and a dialogue was stimulated. Also, *internal marketing of a system* was important for gaining support, creating system buy-in and reducing apprehension about using a new system (Cronin et al. (2006). Successful marketing methods suggested during the study included offering system demonstrations to HR staff and managers, sending e-mails that describe the functionality of the new system, posting links to the new system on the HR website, disseminating information about the system via word of mouth, providing just-in-time training to users and building 'buy-in' among department leaders and having leaders promote the system. This factor was also reported by Tansley and Watson (2000) who call it *constant communication processes* between the project members and the rest of the organization. By means of newsletters and regular 'road shows' the employee's received constant updates and were enabled to identify their concerns. Finally, a major obstacle during the implementation process was described in the literature as an *inability to prove need or show potential payback* (Reddick, 2009). In this way, top management support, which we discuss in a later section, is hard to realize.

The findings also showed that an implementation cannot start or thrive without adequate resources. A resource mentioned by Hooi (2006) was the availability of *financial resources*. Inadequate budget/funding (Reddick, 2009) and an organization's economic situation (Hustad & Munkvold, 2005) were found as major hindrances to implementing an e-HRM system as well.

People factors

The aspect of communication is another important aspect mentioned as important in the adoption of e-HRM. On the way in which e-HRM supports employee retention management, Beulen (2009) outlined that the application for benefits administration which he investigated had a difficult start due to lack of *communication about intended use of application.* It thus seemed that the organization had not clearly communicated about how the application should be used and for what purposes. Also, Martin and Reddington (2010) investigated an e-HR implementation in two strategic business units and found that the line managers from both SBU's differed in their attitudes towards e-HRM. As a factor for the negative attitudes of one of the business units the authors mention *lack of consultation* about the implications of the new system.

Other findings show the importance of *organizational culture*. For instance, Panayotopoulou et al. (2007) reported that organizational culture was a determining factor for implementation success. Thus, adhering to these findings, when an organizational culture is IT-friendly, there is a greater chance for success. Correspondingly, Chapman and Webster (2003) found *organizational culture* as a determinant for the adoption of systems. The authors outlined that organizations with a people orientation (respect for people, excellent employer, well-managed, people orientation) were more cautious for implementing new systems than organizations with a dynamic culture (growth-oriented, aggressive, dynamic, innovative). In accordance with this, the above mentioned study of Martin and Reddington (2010) on two separate business units mention most positive and negative attitudes towards the e-HRM implementation could be attributed to the difference in receptiveness context of the two subsidiaries, like for instance the lack of integrated culture with head quarters (due to the fact that the subsidiary was acquired externally and not grown from headquarters). Finally, Parry and Wilson (2009), also found that *subjective norms*, or the dominant attitudes and beliefs within an organization, were positively correlated with the decision to adopt online recruitment tools such as the corporate website or commercial job boards. Specifically, they revealed that the percentage of vacancies advertised via the corporate website were significantly impacted by subjective norms (β=0,426;t=7,647;p=0,000).
A number of demographics were investigated on the individual level as well. However, *age* (β= 0,08), *gender* (β= 0,02) and *job experience (in years)(* β= 0,01) were all reported as insignificant in relation to attitude towards e-HRM (Voermans & van Veldhoven, 2007) and *age* (β=0,003), *gender* (β=-0,001) and *education* (β=0,001) also resulted in insignificant relationships with adoption (Strohmeier & Kabst, 2009).

Furthermore, the literature showed that individual knowledge and skills impacted adoption success. Panayotopoulou et al. (2007) reported that *individual IT skills* and *HR professionals' IT competence* were clear contributors to the successful adoption of e-HRM in Greece. Additionally, Ruël et al. (2004) found that adoption was positively influenced by the *pc skills of management and employees*. Contrary to these findings, quantitative research of Voermans and van Veldhoven (2007) was not supportive of *knowledge of IT* as an important factor. They revealed that knowledge of IT did not significantly influence attitudes towards e-HRM (β= -0,02). However, attitude towards e-HRM did not have a sole causal relation with adoption. Research on attitudes shows that not only attitudes, but also subjective norms (the way other individuals or groups think one should behave) and perceived behavioral control (the amount of control one has over his/her behavior) influence ones intention to behave in a certain way (Ajzen, 1991). This effect is also known as the Theory of Planned Behavior (Ajzen, 1991).

Another important influencing factor we found was leadership. Tansley and Watson (2000) show that the presence of a *visionary, supporting and encouraging leader* which advocated the project was of great importance for the adoption of a system. In line with this, Hustad and Munkvold (2005) and Olivas-Luján and Florkowski (2010) reported on the importance of the *presence of an HR technology champion* which stimulated commitment and focus towards a system. Additionally, in their survey of HR staff and line managers in five hospital districts directly involved in the implementation of HR/payroll integrated HRIS (34 respondents) and an automated rostering system (26 respondents) on the key determinants of successful information systems implementation, Wilson-Evered and Härtel (2009) revealed that HR staff were more open to new ideas and the introduction of an

HRIS when the *leader was supportive and effective in change leadership* (F(5,42) =2,514; p =0,016). The same was found for the line manager group (F(5,47)=3,424; p=0,001) (Wilson-Evered & Härtel, 2009).

Next, a great number of factors were categorized as psychological factors. Tansley and Watson (2000) clarified that *trust between members of the project team* was of paramount importance for the successful cooperation within a project team and the eventual adoption of a system. Also, Parry and Wilson (2009) reported that *positive beliefs about relative advantage* (β=-0,130;t=-2,499;p=0,013) and *negative beliefs* (β=-0,243;t=-5,213;p=0,000) significantly impacted adoption of e-HRM. In accordance with this, Olivas-Luján et al. (2007) investigated *employees' mindset towards e-HRM* and revealed that some employees who thought that e-HRM would increase their workload due to the fact that they had to fill in certain forms themselves showed resistance to change. In line with this, Ruël et al. (2004) stated that when line management and employees have no willingness to use the system a change in their mindset is necessary in order to achieve successful adoption.

Staff resistance to change was also mentioned as a barrier to adoption by Reddick (2009), thus highlighting the importance of mitigating this resistance once more. Other barriers mentioned by Reddick (2009) were *security and privacy fears*. Especially with e-HRM, a system which pre-eminently holds privacy sensitive information about all members of the organization, this did not come as a surprise. On the basis of these findings we can say that it is of paramount importance that organizations guarantee the security of personnel data as much as possible in order to mitigate fear and resistance.

Furthermore, Voermans and van Veldhoven (2007) investigated some curious factors derived from Ulrich's HR professionals' roles (1997). Specifically, they tested the relationship between the extent of an employees' preference for an administrative expert, employee champion, strategic partner and change agent in relation to attitude towards e-HRM. They found that when employees have a *preference for an HR professional in a strategic role* (both strategic partner and change agent) they had a more positive attitude towards e-HRM (β=0,34; p<0,01). This was also the case when employees (β=0,32; p<0,01) and managers (β=0,38; p<0,01) were investigated separately. On the other hand, when employees have a *preference for an HR professional in an employee champion role* they have more negative attitudes towards e-HRM (β=-0,13; p<0,05). This was also the case for both employees (β=-0,13; p<0,05) and managers (β=-0,21; p<0,05). The role of administrative expert was insignificantly related to attitude. As an explanation we suggest that employees with a preference for an employee champion-role value the face-2-face contact with an HR professional, and thus prefer face-2-face contact above digitalization. On the other hand, when employees prefer a strategic role for an HR professional they see e-HRM as a tool for achieving a more strategic focus for HR. This is also in line with the above mentioned finding of organizational culture by Chapman and Webster (2003) who stated that organizations with a dynamic culture achieved adoption to a greater extent than organizations characterized by a people culture.

Furthermore, Wilson-Evered and Härtel (2009) found that HR staff was more open to new ideas and the implementation of an HRIS when *group morale* was high (F(5,42) =2,988; p=0,005) and there was a low level of *workplace distress* (stress) (F(5,42) = –2,206; p=0,033). Line managers showed to be more receptive when they felt *confident about their technology skills* (F(5,47) =3,314; p=0,002) and felt *satisfied with their job* (F(5,47)=2,143; p=0,037).

Finally, Martin and Reddington (2010) found that *perceptions of HR staff* also influenced employees' attitudes towards e-HRM. Their study showed that when employees had negative perceptions of HR staff, they were also less receptive for e-HRM. The reason the investigated line managers had negative perceptions of HR staff was that they felt undervalued since, in their own opinion, HR staff did not have enough knowledge about the role the line managers played in the organization.

A next category of factors we found pertain to the category of support and commitment. Hustad and Munkvold (2005) reported that gaining *commitment from management and employees* towards the e-HRM project was an important factor for successful adoption. These findings are backed by Panayotopoulou et al. (2007) who revealed that *management commitment* was a critical success factor. Thus, according to these findings, when managers and employees are committed to the project, they are willing to put their effort into the project and steer it towards successful adoption. In line with these findings, Hustad and Munkvold (2005) showed the importance of *top management priority* towards the project. This means that top management puts their priority in investing resources (people and money) into the project. Intuitively speaking, this is of course a necessary prerequisite for every implementation. Without top management providing the necessary resources, we think it is impossible to implement a system. This factor was also mentioned as *top management support* by Teo et al. (2007) and Olivas-Luján et al. (2007). Both studies found that it was positively related to adoption and Teo et al. (2007) even supported this statistically ($F= 28.703$; $p=0,000$). From the opposite point of view Reddick (2009) reported that *lack of support from officials* and *lack of CEO or manager support* were important barriers to the successful adoption of HRIS.

In accordance with these findings, Olivas-Luján et al. (2007) found that *top and line management commitment to the e-HRM strategy* was a determining factor for the adoption of a system. Thus, it is not only commitment to the project itself which positively influences adoption but also commitment towards the long term goals of such an implementation. Considering these findings, we can say that the e-HRM project is just a small part of the long term e-HRM strategy and we therefore expect that commitment towards the strategy is even a stronger motivator for adoption than commitment to the project. Another important finding was done by Voermans and van Veldhoven (2007), who reported that *experienced user support* was significantly related to attitude towards e-HRM ($\beta=0,11$; $p<0,05$). When controlling for stakeholder, they found that this factor was significant for and managers ($\beta=0,26$; $p<0,05$) and not so much for employees. Thus, according to these findings, when managers experience more user support during a system' implementation they have more positive attitudes towards e-HRM than when they do not.

Next, we found that training was another factor which positively contributed to adoption. Martin and Reddington (2010) reported that *lack of adequate training* led to negative attitudes towards e-HRM since employees did not have the requisite knowledge and skills to operate the system. Cronin et al. (2006) also emphasized the importance of training in the form of *training HR staff, management and employees* to teach them how to use the system and increase buy-in and apprehension. In line with this, Panayotopoulou et al. (2007) revealed that *training HR professionals in system usage* was determinative for successful adoption of e-HRM.

A final category of people factors we labeled user and stakeholder involvement. Tansley and Watson (2000) reported on *involvement of HR and IS specialists* and the *involvement of HR and IS managers from other subsidiaries* as contributors to adoption. The implementation project in the case study took place in Europe, and the American HR and IS managers were also involved. The authors showed that this led to a decrease in post-implementation conflicts, since the new system answered to everyone's needs. We pose that involving stakeholders from other subsidiaries is not only important in internationally operating organizations but also in organizations with different subsidiaries within one country. Further, Cronin et al. (2006) reported that when developing a customized system the *involvement subject matter experts (HR staff)* to identify the different needs was an important success factor. Involvement helped minimizing future disagreements and increased acceptance for the system. In sum, the key conclusion we draw from these factors is that it is important to involve all relevant stakeholders in order to consider their needs, increase their acceptance and avoid post-implementation conflicts and disappointments.

Environmental factors

In total, we found three factors outside the direct control of the organization which impacted adoption of e-HRM. Haines and Lafleur (2008) showed that *union presence* negatively impacted IT usage ($r=-0,23$; $p<0,01$). Thus, these findings show that when organizations operate in sectors with high union presence, a lower degree of e-HRM adoption is expected.

Further, a *country's economic development* was revealed to influence adoption as well (Olivas-Luján et al., 2007; Strohmeier & Kabst, 2009). Olivas-Luján et al. (2007) reported that although Mexico's economic situation had improved, most companies still lagged behind in IT facilities and knowledge. Strohmeier and Kabst (2009) showed that a country's economic development of national business systems also affected adoption. The business system of eastern Europe ($\beta=0,333$; $p<0,05$) was significantly related top e-HRM adoption while the business system of western Europe ($\beta=-0,321$; $p<0,05$) and southern Europe ($\beta=-0,526$; $p<0,05$) were negatively related. However, the authors reported that GDP (gross domestic product) did not affect adoption ($\beta=0,000$).

Finally, *country culture* was found to influence adoption of e-HRM as well (Olivas-Luján et al., 2007; Smale & Heikkilä, 2009). Olivas-Luján et al. (2007) revealed that characteristics of the Mexican culture had important implications for the way in which employees viewed their superiors. Mexico is characterized by strong hierarchical layers, a characteristic which manifests itself in a great amount of respect towards superiors. Thus, when superiors decide to implement a system they do not experience high degrees of resistance. The same holds true for the Finnish culture, which is also characterized by high power distance. This is accompanied by high employee receptiveness to top-down initiated plans (Smale & Heikkilä, 2009).

3.3.4 Factors affecting consequences of e-HRM implementations

In total, we found 45 factors affecting consequences which we outline along the familiar categorization. *Table 12* summarizes our findings.

Technology factors

The first technology factors pertain to applications and their characteristics. Neary (2002) reported that for the development of a uniform performance appraisal and management system *system security of access* was an important factor. As for functionality of the application, Chapman and Webster (2003) described that the *option of using keyword searches* within the selection process could decrease the negative impacts of the increased applicant pool, i.e. a greater number of under-qualified applicants. By using this functionality employees avoided 'drowning in data' which impacted the efficiency with which they could do their work. The authors also mentioned another quite straightforward factor which could impact operational consequences, namely *technology malfunctioning*. On the basis of these findings we can say that technology dependence can, in some cases, be quite detrimental. Furthermore, in their online questionnaire research concerning which factors of e-HRM lead to HRM effectiveness Ruël et al. (2007) investigated 100 operational employees, managers and HR professionals in the Dutch ministry of internal affairs. Specifically they investigated *perceived ease of use* and *perceived job relevance* in relation to technical and strategic HRM effectiveness and found that both factors were not significantly related to either of the dependent variables. Technical HRM effectiveness was defined as HRM performance on traditional HR tasks such as recruitment, training, and compensation administration whereas strategic HRM effectiveness was measured by the development and implementation of HR policies aligned with business strategy.

Table 12: *Factors affecting e-HRM consequences 2000 - 2010*

Category	Factors	Evidence from literature
Technology factors	<u>*Applications & characteristics*</u> Systems security of access Technology malfunctioning Option to use keyword searches Ease of use (insignificant) Job relevance (insignificant) Quality of applications (content & design) Using manager self service applications General IT usage Usefulness of applications HR portal configuration Alignment of HR portal with HR strategy	*'The outcome of the data analysis showed that..the quality aspect of the e-HRM application had significant, positive effects on strategic HRM effectiveness'* - Ruël et al. (2007, p. 287)
	<u>*Integration/alignment*</u> Organization wide HR portal Customization of intranet Integration of applications Local adaption of HRIS Strategic fit of HR system with HR strategy Alignment of IS across subsidiaries Language standardization	*'In a context where HR portals are frequently and easily accessed, the HR portal configuration, if aligned with the HR strategy, will leverage intellectual capital creation and development'* - Ruta (2009, p. 563)

	Project In-house development vs commercial applications Mapping database structure and data base management	*'Smaller companies and those who do less hiring may benefit more from buying commercial applications (due to costs)'* - Chapman & Webster (2003, p. 118)
Organizational factors	*Demographics* Organizational size Firm age (insignificant)	*'..a significant correlation on scale five indicates that there is more data analysis being performed than simple data management with the extra features that a typical HRIS would contain when the organization has more employees'* - Ball (2001, p. 688)
	Knowledge & skills Awareness and understanding of HR system potential Technical expertise of project team Upgrade of talent	*'The case clearly demonstrates that the reason for this limited impact was that those who were involved in the introduction of the HRIS had a restricted view of the potential of the ERP HR system, seeing it merely as a tool to automate HR information (as in an electronic filing cabinet), rather than informating or transformating HRM in the company'* - Tansley et al. (2001, p. 364)
	Organizational policies & practices Screening system and criteria Competence management process Possibility for employees to choose HR system ('real-life' vs HRIS) Type of information disclosed Organizational policies regarding career development Blended learning Standardization of HR practices vs. local practices HR professional's functional orientation Type of information stored (mediator) Way information is used (mediator)	*'E-tools were not considered as supporting career development* *The Career Development Policies played the basic role, and e-tools could not advance policy making'* - Bondarouk et al. (2009, p. 588, Table 1)
	Project Mapping HR processes Cross-functional project team Planning of implementation Internal marketing of system	'..each process was mapped independently of all other HR processes. The opportunities for integrating data and information across processes to facilitate more radical change were therefore missed' - Tansley et al. (2001, p. 362)
People factors	*Communication* Communication via e-learning Feedback after system implementation	*'HR had not asked customers for any feedback on their usage or satisfaction with the intranet (impacted clients' perception of service provision)'* - Alleyne et al. (2007, p. 303)
	Demographics	*'According to Table 2, there were no*

	HR professional's age (insignificant) HR professional's gender (insignificant)	*significant results regarding the moderating effects for age, gender (in relationship between IT usage in HR and certain consequences)'* - Gardner et al. (2003, p. 167)
	<u>*Support & commitment*</u> Top management support Support from business units	*'..support from top management is perhaps the main factor that has made it possible for "Local Bank" to establish its e-HRM strategy successfully'* - Olivas-Luján et al. (2007, p. 426)
	<u>*Training*</u> Training	*'No training had been given on the HR intranet applications (impacted clients' perception of service provision)'* - Alleyne et al. (2007, p. 303)
	<u>*User/stakeholder involvement*</u> Stakeholder involvement Customer involvement	*'..failure to involve line managers and others in the project who were potentially impacted by the new IT system (e.g. trade unions) meant that there was little consideration of how the new IT system could potentially change relationships "on the shopfloor"* - Tansley et al. (2001, p. 366)
Environmental factors	<u>*Country culture*</u> Country culture	*'..adding local training courses to the global tool is critical because such tools reinforce the retention of employees. Especially in the larger countries, such features are used to a greater degree(thus emphasizing that the way culture is dealt with impacts retention)'* - Beulen (2009, p. 283)

Moreover, Beulen (2008) revealed that *use of manager self-service applications* increased efficiency and effectiveness since it allowed for direct input from line management and employees which eliminated the aspect of doing the same work twice. Also, Haines and Lafleur (2008) found significant correlations between *IT usage* and the role of business partner ($r=0,25$; $p<0,001$) and change agent ($r=0,21$; $p<0,01$) as well as between *IT usage* and technical HR effectiveness ($r=0,37$; $p<0,001$) and strategic HR effectiveness ($r=0,40$; $p<0,001$). Thus these findings highlight IT usage as a predicting factor for organizations trying to achieve operational and strategic e-HRM consequences.

Both Bondarouk et al. (2009-1) and Ruël et al. (2007) highlighted *quality of e-HRM applications* (content and design) in relation to consequences. In their survey of 10 line-managers and 11 employees working in the Dutch Ministry of Interior and Kingdom Relations on the use of a career development application Bondarouk et al. (2009-1) found that organizations should focus more on the quality of the e-HRM application than on the ease of use and job relevance to make e-HRM contribute to HRM effectiveness. For instance, as shown in their results, the career development tool did not provide the necessary options for certain activities. Although ease of use and

usefulness might stimulate usage, they did not necessarily lead to HRM effectiveness. Additionally, Ruël et al. (2007) revealed that quality of e-HRM was a significant factor affecting strategic HRM effectiveness (β=0,35; p=0,003; *n*=100) and technical HRM effectiveness (β=0,41; p=0,001; *n*=100).

Moreover, Ruta (2009) reported that *HR portal configuration* was an important determinant of the system's success in supporting intellectual capital creation and maintenance. The author described that the HR portal was composed of different HR applications that needed to be designed and implemented coherently with the HR strategy and should be focused on accessible, user-friendly and integrated information systems. Further, the *usefulness of the applications*, or the extent to which the applications supported the goals, was also found as an important factor in reaching intellectual capital creation and maintenance (Ruta, 2009).

The next category of factors were labeled integration or alignment. By integration we mean the degree to which the applications are integrated with each other in the sense that information is the same throughout all applications. Ruta (2009) provides us with a clear definition of alignment:

'the degree to which the information technology mission, objectives, and plans support and are supported by the business mission, objectives, and plans' (Ruta, 2009. p. 567)

In this category Ruta himself reported that *alignment of the HR portal with HR strategy* was an important determinant of the system's success in supporting intellectual capital creation and maintenance (Ruta, 2009). Accordingly, Tansley and Watson (2000) determined that by achieving a *strategic fit between HRIS and HR- and corporate strategy* e-HRM contributed to the strategic effectiveness of HRM. Also in line with this, the literature showed that an *organization-wide HR portal* itself was crucial in the process of transforming the HR department into a strategic partner (Svoboda & Schröder, 2001).

Next, as mentioned above, Morris et al. (2009) investigated whether the alignment of formal HR processes, informal people alignment and information system alignment contributed to a subsidiary's capability of replicating HR practices along subsidiaries and found that *alignment of IS along subsidiaries* significantly contributed to replication capability (r=0,22; p<0.05). It did not, however, contribute to people alignment (r=-0,7; p>0,05). Additionally, Beulen (2009) reported that the *global integration of applications* clearly contributed to retention of talented employees.

Somewhat contrary to these findings was the factor *local adaption of applications* (Beulen, 2009; Smale & Heikkilä, 2009). Beulen's research (2009) at globally operating consultancy company Accenture reported that local adaption can, and even needs to, coexist with integration. To support this view, Beulen emphasized that since the company's subsidiaries operate in different cultures employees have different preferences. For instance for the way training is provided, the language of training and being exchanged abroad. According to these findings, a certain degree of local adaption is always necessary in order to retain employees. Smale and Heikkilä (2009) painted a similar picture but recognized certain trade-offs. They also investigated an internationally operating company and found that employees of the Finnish subsidiary could not effectively cope with the language standardization of the e-HRM system, which eventually resulted in failing to achieve certain strategic

goals. The only local adaptions the company accepted were those demanded by local regulations. In this case, the costs associated with adaption and the threats to process standardization and data integrity outweighed the necessity of local adaption (Smale & Heikkilä, 2009). Finally, Alleyne et al. (2007) found that *customization* of the intranet to the needs of different clients enhanced client satisfaction with the system. As these findings show, it is important for organizations to consider the trade-offs when choosing to either locally adapt or standardize and integrate systems . Also organizations should clearly define what goals they are trying to achieve with e-HRM.

Concerning the implementation project we found two factors impacting consequences. Chapman and Webster (2003) reported on the importance of deciding upon *developing a system in-house* and *buying commercial applications*. The authors outlined that in-house development can be beneficial to large companies which hire a lot of new personnel each year and mostly have systems in place which are hard to modify, while off-the shelf applications are more economically viable for small companies. Thus emphasizing *organizational size* as a contingency factor. In relation with this finding Florkowski and Olivas-Lujan (2006) noted that organizations who decide upon outsourcing mostly share responsibility over the system with outside vendors. This automatically means that outsourcing bares a certain risk since vendor trustworthiness is not always guaranteed and control over the application can be limited. Once again, organizations face a certain trade-off and should investigate whether the potential cost-savings reached with outsourcing offset the perceived downsides of loss of control. Finally, Cronin et al. (2006) mentioned *mapping database structure and database management* as an important factor prior to the implementation. By considering this factor, organizations can ensure that the system is fitted to its users. A system has the capacity to collect and process great amounts of data and without carefully mapping this structure, organizations can also get lost in data, which can hinder the achievement of certain goals.

Organizational factors

The first group of organizational factors comprises of demographics. Ball (2001) found that *organizational size* was predictive for the type of information stored in the HRIS, the way the information was used and the amount of additional non-core HR applications. The more employees employed by the organizations the more information was held on both the organization and the individual, the more information was used for analysis rather than administration and the less likely it was that additional modules were purchased. On the basis of these findings we pose that the achievement of strategic goals is expected to a greater extent in larger organizations. This is also supported by research of Haines and Lafleur (2008) who found that organizational size was significantly correlated with the role of an HR professional as business partner ($r=0,17$; $p<0,01$). The last finding of Ball (2001) is in line with the earlier mentioned finding that for large organizations it may be difficult to implement off-the-shelf applications since they are hard to integrate with the systems already in place. Haines and Lafleur (2008) also investigated *firm age* in relation to the HR roles of business partner and change agent and the technical and strategic HR effectiveness but did not find significant relationships.

The next group op factors we labeled as knowledge and skills. In their case study Tansley et al. (2001) revealed that the HR system did increase automation of routine tasks but failed to change HR's role into a strategic one. As an important organizational factor leading to this failure they mentioned *lack of awareness and*

understanding of potential of HR system. This was caused by a lack of knowledge and experience, but also a reluctance to go to training due to fear for technology. Also, the system itself was still in development and training thus lagged behind. These findings tell us that in order to achieve strategic goals, it is of great importance that employees do not feel resistance, are aware of the potential of e-HRM and know how to exploit that potential. In accordance with this, Svoboda and Schröder (2001) mentioned that when organizations aim for a radical transformation of the HR department to being more strategic this has to go hand in hand with an *upgrading of talent*. Thus, according to these results, when organizations do not possess the required resources it is hard to achieve strategic reorientation of the HR department. Finally, for the development of a uniform performance appraisal and management system Neary (2002) mentioned *technical expertise of the project team* as an important success factor. However, we pose that this factor is important for the implementation of all kinds of e-HRM. Additional research is needed to confirm this.

Further, another category of factors we labeled as organizational policies and practices. Chapman and Webster (2003) mentioned *well organized screening system and criteria* as important factors for solving the problems associated with an increase in under-qualified applicants when using technologies in recruiting, screening and selection processes for job candidates. As a result of using online recruiting tools organizations mostly experienced an increase in applicants. However, when organizations did not thoroughly specify their selection criteria this could result in an increase in under-qualified applicants and thus an increase in administrative burden to filter out these applicants (Chapman & Webster, 2003). Additionally, Hustad and Munkvold (2005) mentioned that a *well defined competence management process* is a prerequisite for achieving strategic HRM effectiveness. According to these findings, organizations need to have a competence management process in place which supports an organization's long term strategy. Bondarouk et al. (2009-1) supported these findings by outlining that *career development policies* which were in line with the goals of the organization played an important role in advancing career development in their case study, independently from e-HRM. e-HRM is thus seen as a tool for supporting the execution of policies in order to realize long term organizational goals.

Another interesting debate in the literature was the *standardization of HR practices* across subsidiaries versus *adapting HR practices to local demands* (Hustad & Munkvold, 2005). The authors outlined how their investigated organization was in the middle of implementing standardized processes throughout the organization in order to stimulate global competence sharing and 'communities of knowing' to support the organization's long term strategy. However, the authors also mentioned that there was a certain degree of resistance towards standardization from different subsidiaries since they were used to making their own choices regarding these practices. We pose that the degree of standardization and local adaption depends on the goals the organization is aiming for and the trade-offs it is willing to make.

Next, Lukaszewski et al. (2008) revealed that *system choice* (the degree of choice employees have between e-HRM and face-2-face service from HR-professionals) negatively influenced privacy invasiveness (β=-0,19; t=-1,71; p<0,05) and was positively related to service satisfaction with HR department (β=0,37; t=3,49; p=0,000). Further, *type of information disclosed* affected invasiveness (β= 0,33; t= 2.97; p<0,01). Invasiveness was greater when it concerned employees' medical information (M = 112.12) than non-medical information (M = 96.68). *Information type* also influenced service satisfaction (β=-0,30; t=-2,80; p<0,01). Service satisfaction was greater

when the information concerned non-medical information condition (M= 44.89) than medical information (M= 38.12). The relationship between invasiveness and service satisfaction was also tested, and the results showed that both variables were negatively related (r =-.54; p<0,01). Finally, the results revealed that the relationship between *system choice* and service satisfaction was mediated by invasiveness. The authors conducted two similar studies whereby the first study found that in the first regression analysis the coefficient (β) for choice was 0,32 (t= 2,72; p<0,01), whereas in the second analysis β was 0,26 (t= 2,57; p<0,05). This indicated partial mediation. However, in the second study they found that in the first regression analysis, the coefficient (β) for choice was 0,23 (t= 1,90; p<0,05) whereas in the second analysis it was 0,14 (t= 1,41; p<0,05). These results suggested complete mediation.

Furthermore, Oiry (2009) investigated *blended learning*, or the combination of e-learning and face-to-face learning, and showed that it mitigated the negative consequences of e-learning (especially lack of human contact). In this case, just as in the study by Lukaszewski et al. (2008), a combination of e-HRM and face-2-face interaction seemed to work best.

Finally, Gardner et al. (2003) investigated the moderating effects of *HR professionals' functional orientation* (i.e are the HR professionals specialists in a certain HR field or do they have general knowledge of all HR fields?) and found it to be insignificant in moderating the relationship between extent of HR professional's IT usage and their information responsiveness, their information autonomy, their use of external professional links, their time spent on transformational activities and their time spent on IT supporting activities. However, this factor was found to directly impact information responsiveness and it increased time demands for transformational activities and IT support activities in the sense that functional specialists positively influenced all three consequences (β=0,10; p<0,05; β=0,13; p<0,05; β=0,22; p<0,001 respectively). Thus, considering these findings, when organizations aim for relational or transformational consequences they should consider organizing their HR practices in a divisionalized way.

As important organizational factors for the implementation project Tansley et al. (2001) showed that *HR process owners who mapped their own processes* were detrimental for changing HR's role into a strategic one. The reason for this is that it was difficult for them to switch to the new philosophy due to their difficulties in envisioning a change from the status quo and a reluctance to change the status quo due to a fear of losing their leadership position and losing their jobs. Also, *mapping each HR process independently* was shown to be at odds with the strategic philosophy the organization under study was aiming for. As mentioned by Tansley et al. (2001) the transformational potential of an HR system lies in the integration of diffuse HR information, and organizations should thus map all HR processes as a coherent whole.

Furthermore, Neary (2002) emphasized *using a cross-functional project team* for the e-HRM project in order to reach uniformity and completeness in evaluating and managing human capital. Somewhat straightforward, Chapman and Webster (2003) mentioned that *good planning of the implementation* was recommended by all their respondents as an important factor for achieving the goals an organization has set. Organizations should outline the potential barriers in order to anticipate on them and should take the necessary measures prior to the implementation to facilitate achievement of aimed goals.

Finally, Alleyne et al. (2007) found that *internal marketing of the system* contributed to client satisfaction with the system. As mentioned in the previous chapter, internal marketing was found in the form of demonstrations of the system, sending e-mails to stakeholders that describe the functionality of the new system, disseminating information about the system via word of mouth, providing just-in-time training to users and appointing a system advocate who motivates stakeholders and keeps them focused on and enthusiastic about the system (see Cronin et al., 2006).

People factors

The first category of people factors was labeled as communication. Alleyne et al. (2007) found that *feedback and evaluation after system implementation* contributed to the users' satisfaction with the system. These findings show it is important that users receive feedback after a large project is finished and the organization provides space for them to address their opinions, thoughts and concerns. Another curious factor addressed by Svoboda and Schröder (2001) is *communication via e-learning*. The authors found that synchronous and asynchronous communication via e-learning applications built team spirit across users. In sum, communication from superiors to subordinates about the system but also communication among dispersed colleagues seems to have positive consequences for organizations. e-HRM can be instrumental in achieving good organizational communication.

Next to demographics on the organizational level we also found demographics at the individual level. However, Gardner et al. (2003) reported that *HR professionals' age* and *HR professionals' gender* were not significant in enabling information responsiveness (β=-0,15; β=0,18), information autonomy (β=-0,16; β=0,08), external professional links (β=-,06; β=0,18) and time spent on transformational activities (β=-0,03; β=0,28) and IT supporting activities (β=0,07; β=-0,03). Also, both factors were not significant in moderating the relationship between extent of HR professional's IT usage and their information responsiveness (β=0,14; β=-0,24), their information autonomy(β=0,31; β=-0,02), their use of external professional links(β=0,11; β=-0,23), their time spent on transformational activities (β=-0,5; β=-0,41) and their time spent on IT supporting activities (β=-0,7; β=0,06).

Furthermore, we distinguished a category of factors which we named support and commitment. Neary (2002) found that *support from each business unit* was important in order to reach a uniform way of performance appraisal and management. However, as reported in earlier decades we pose that support from each business unit is also a factor which is important in all kinds of implementations. This, in our view, also holds true for the factor *middle and top management support*, as mentioned by Tansley et al. (2001). The authors reported that lack of middle and top management support was one of the reasons an implementation project failed to achieve a strategic reorientation of the HR department, thus highlighting the importance of this factor when organizations strive for this goal. The organization did however reach a higher operational effectiveness of the HR department without the support of middle and top management.

In our category training (Alleyne et al., 2007), we only found one factor. Alleyne et al. (2007) outlined the importance of *training* in relation to users' satisfaction with the system. The authors found that providing training to users positively influenced their satisfaction.

Finally, in our category of user or stakeholder involvement, Alleyne et al. (2007) mentioned *customer involvement* in relation to satisfaction with the system and found that customer involvement positively contributed to it. Further, in the above mentioned research by Tansley et al. (2001) the authors addressed a *failure to involve stakeholders impacted by the system* as an important hindrance to the organization in changing HR's role towards a more strategic one.

Environmental factors

We found one environmental factor in research by Beulen (2009). The author investigated an internationally operating company and outlined that *country culture* was a determining factor in the way the organization was able to organize its retention management activities. As mentioned in our category of integration and alignment the organization tried to achieve global integration of applications but balanced this by means of a certain degree of local adaption. Since employees working in different cultures had different preferences regarding e-HRM it was important for the organization to answer to these needs in order to retain talented employees.

3.3.5 Towards a framework

In comparison to prior decades we can see that the amount of research on e-HRM has grown significantly. The number of relevant articles grew from 12 to 51. This logically resulted in an increase of identified factors and consequences.

Considering the factors affecting adoption a noticeable difference is that we found a lot more people factors compared to earlier decades. In the 2000's 57% (43 of 75) of all factors affecting adoption were people factors as opposed to 45% (29 of 64) in the 1990's and 29% (6 of 21) in the 70's and 80's. From these percentages we can conclude that throughout the years there has been an increased awareness for the human aspect in e-HRM implementations.

As for factors affecting consequences, we did not see an increase from the 90's. As a comparison, the percentage of factors affecting consequences is 37% (45 of 122) while in the 90's it was even higher: 41 % (46 of 111). However, it is important to note that almost all factors affecting consequences from the 90's were derived from research of Haines and Petit (1997), namely 30 of 45, and that all these factors were investigated in relation to user satisfaction. In contrast, the 46 factors identified in the 2000's are much more dispersed throughout the literature and were also found to affect a larger amount of diverse consequences.

Furthermore, another sharp contrast with the 90's is that research presented a lot more evidence on relational and transformational consequences, while evidence on operational consequences stayed more or less the same. In our view, this is attributable to the switch from HRIS to e-HRM whereby applications are targeted to a greater extent to internal customers. It also shows an increased awareness of the more far-reaching potential of using e-HRM in organizations. e-HRM is increasingly being used to support the long term strategy of an organization by means

of transforming HR professionals from administrative experts to strategic business partners. However, as shown in our review, we found that this goal is not easily reached without considering a number of factors.

Although we expected otherwise, rigorous empirical studies are still uncommon (see Florkowski & Olivas-Luján, 2006). In the 2000's 25% of all studies were statistical (13 of 51), this is the same percentage as in the 90's. Most factors and consequences were identified in case studies which do not provide statistical 'hard' evidence. However, as mentioned earlier, our goal was to identify factors, not to explore the strengths of these factors in relation to certain outcomes. In sum, when looking at our found relationships we can conclude that e-HRM research is still developing, leaving numerous gaps to be explored. *Figure 8* and *Figure 9* illustrate our contingency framework including all findings from the last decade while in *Table 13* we more specifically outline the investigated relationships in the literature. In previous decades, the contingencies were all moderators. In this decade we also found two mediators, which we marked as 'med' in the figures and table.

***Figure 8**: Contingency model: e-HRM adoption in the 00's*

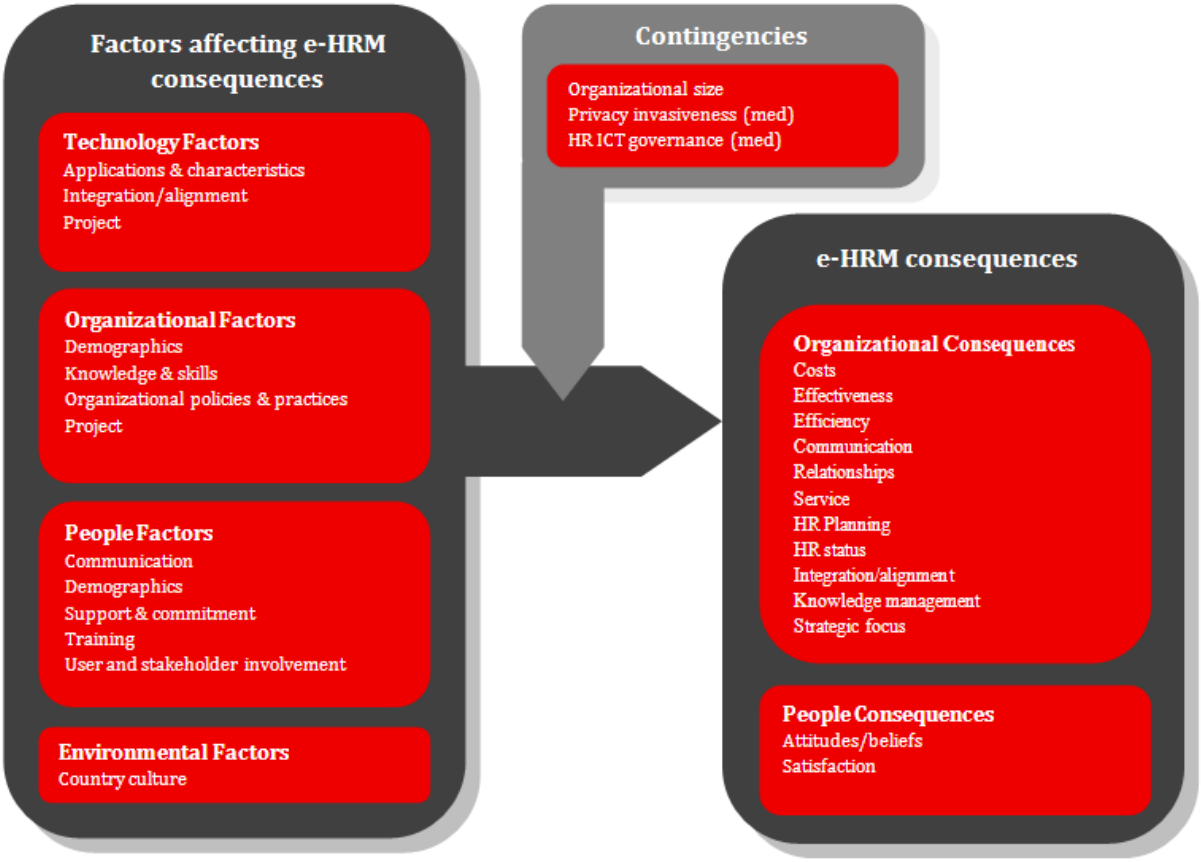

Figure 9: *Contingency model: e-HRM consequences in the 00's*

Table 13: *Relationships investigated in the literature 2000 -2010*

+ = positive effect, - = negative effect, 0 = no effect

Category	Factor	Mediator/Moderator	Consequence
Technology factors	Systems security of access		+ Uniformity and completeness in evaluating and managing human capital
	Option to use keyword searches (functionality) → Does not lead to consequence but affects it		+ Number of under-qualified applicants + Size of applicant pool
	Perceived ease of use		0 Strategic HRM effectiveness
	Perceived job relevance		0 Strategic HRM effectiveness
	Using manager self-service applications		+ Efficiency + Effectiveness
	IT usage		+ Technical HRM effectiveness + Strategic HRM effect + HR professional's role as strategic business partner

			+ HR professionals' role as change agent
	IT usage	HR professional's age*(mod)* HR professional's gender *(mod)* HR professional's functional orientation (specialist vs generalist) *(mod)*	0 Information responsiveness 0 Information autonomy 0 Making use of external professional links 0 Time spent on transformational activities 0 Time spent on IT supporting activities
	Quality of e-HRM application (content and design)		+ Effectiveness
	Perceived quality of applications (content)		+ Technical HRM effectiveness + Strategic HRM effectiveness
	Usefulness of applications		+ Development of intellectual capital
	HR portal configuration		+ Development of intellectual capital
	Organization-wide HR portal		+ HR as strategic partner
	Customization of the intranet		+ Satisfaction with HR intranet (from HR customers and managers)
	Global integration of applications		+ Employee retention
	Local adaption of HRIS		+ Strategic HRM effectiveness + Employee retention
	Alignment of HR portal with HR strategy		+ Development of intellectual capital
	Strategic fit between HRIS and HR- and corporate strategy		+ Strategic HRM effectiveness
	Alignment of IS along company subsidiaries		0 People alignment across subsidiaries + Replication capabilities of HR practices across subsidiaries
	In-house development	Organizational size *(mod)*	+- cost savings
	Commercial applications	Organizational size *(mod)*	+- cost savings
	Mapping data base structure and data base management prior to implementation → Does not lead to consequence but affects		+ Amount of information

	it		
Organizational factors	Organizational size		+ Strategic HRM effectiveness + HR professionals' role as strategic business partner 0 HR professionals' role of change agent + Operational consequences (efficiency, effectiveness, cost savings) + Type of information stored and way information is used (administrative/analytic)
	Firm age		0 HR professionals' role as strategic business partner 0 HR professionals' role as change agent 0 Technical HR effectiveness 0 Strategic HR effectiveness
	Lack of awareness and understanding of potential of HR system		- Scopus of HR more towards strategic issues
	Technical expertise of project team		+ Uniformity and completeness in evaluating and managing human capital
	Upgrade of talent		+ Strategic HRM effectiveness
	Well organized screening system and criteria → Does not lead to consequence but affects it		+ Increase in number of under-qualified applicants
	Well defined competence management process		+ Strategic HRM effectiveness
	Choice of HR system ('real-life' vs HRIS)		- Privacy invasiveness + Satisfaction with HR service
	Type of information disclosed (medical vs non-medial)		- Privacy invasiveness + Satisfaction with HR service
	Organizational policies regarding career development		+ HR planning
	Blended learning		- Lack of human contact
	Global standardization (centralization) of HRM practices vs local practices		+ Strategic HRM effectiveness
	HR process owners		- Scopus of HR more towards strategic

	mapping own processes		issues
	Mapping each HR process independently		- Scopus of HR more towards strategic issues
	Use of cross-functional project team		+ Uniformity and completeness in evualating and managing human capital
	Internal marketing of the system		+ Satisfaction with HR intranet
People factors	Communication via e-learning		+ Team spirit
	Feedback (evaluation) after system implementation		+ Satisfaction with HR intranet (HR customers and managers)
	HR professional's age		0 Information responsiveness 0 Information autonomy 0 Making use of external professional links 0 Time spent on transformational activities 0 Time spent on IT supporting activities
	HR professional's gender		0 Information responsiveness 0 Information autonomy 0 Making use of external professional links 0 Time spent on transformational activities 0 Time spent on IT supporting activities
	HR professional's functional orientation (specialist vs generalist)		+ Information responsiveness + Time spent on transformational activities + Time spent on IT supporting activities 0 Information autonomy 0Making use of external professional links
	Support from each business unit		+ Uniformity and completeness in evaluating and managing human capital
	Top management support		+ Upgrading role of HR professional to more strategic
	Lack of middle and top management support		- Scopus of HR more towards strategic issues
	Training		+ Satisfaction with HR intranet (HR customers and managers)

	Failure in involving stakeholders impacted by the system		- Scopus of HR more towards strategic issues
	Customer involvement		+ Satisfaction with HR intranet (HR customers and managers)

4. Discussion

We start this section by critically discussing our findings and presenting the final models. Then we outline identified research gaps in the literature, implications for research and practice and limitations of our own research. Finally, we present a practical verification of our results. In order to investigate to what extent our model reflected e-HRM implementations in practice we discussed our findings with two expert business consultants in the field of e-HRM, an e-HRM software supplier and an HR professional of an organization which has recently implemented e-HRM.

4.1 General discussion

We started our study with the following research question:

‘*‘What are the factors affecting the success of e-HRM as found in four decades of e-HRM research literature?’*

On the basis of our literature review spanning four decades of HRIS and e-HRM research we can say that this question is not easily answered since ‘success’ depends on what goals an organization is aiming for with e-HRM. When looking at our results we can, however, say a lot more about the factors organizations need to consider when aiming for certain goals.

Figure 10 and *Figure 11* illustrate our final framework integrating all findings. Only major categories are shown in order to keep a clear overview. For subcategories and all the factors and consequences they comprise, we refer to all the tables we previously presented for each decade.

When looking at our findings from an all-encompassing view our first observation is that the literature can be divided into two salient research streams describing different types of success. Namely, a research stream concerned with adoption of e-HRM and factors affecting successful adoption and a stream which is concerned with consequences of e-HRM and factors affecting these positive or negative consequences. We found that this distinction was present throughout all decades, although the initial decade showed significantly more results concerning the first stream than the second.

A second persistent finding is that all factors, whether affecting adoption or consequences, could be categorized along the same framework, namely: technology factors, organizational factors, people factors and environmental factors. Although some factors do show a relation to multiple categories and categories are not mutually exclusive we think this framework provides a scientifically grounded distinction between the different types of factors as found in the literature.

Third, we propose that the most important factors affecting adoption as well as consequences reside in our category of ‘people factors’. Although technology and organizational factors are necessary prerequisites, people

factors, and especially the mindsets within a certain organizational culture, were found to make the difference. This is also supported by Ruël et al. (2004) who reported that successfully implementing e-HRM in an organization requires a change in employees' mindsets, since it requires them to do their work differently. ten years earlier, Kossek et al. (1994) also mentioned organizational culture as the most important factor in achieving strategic goals

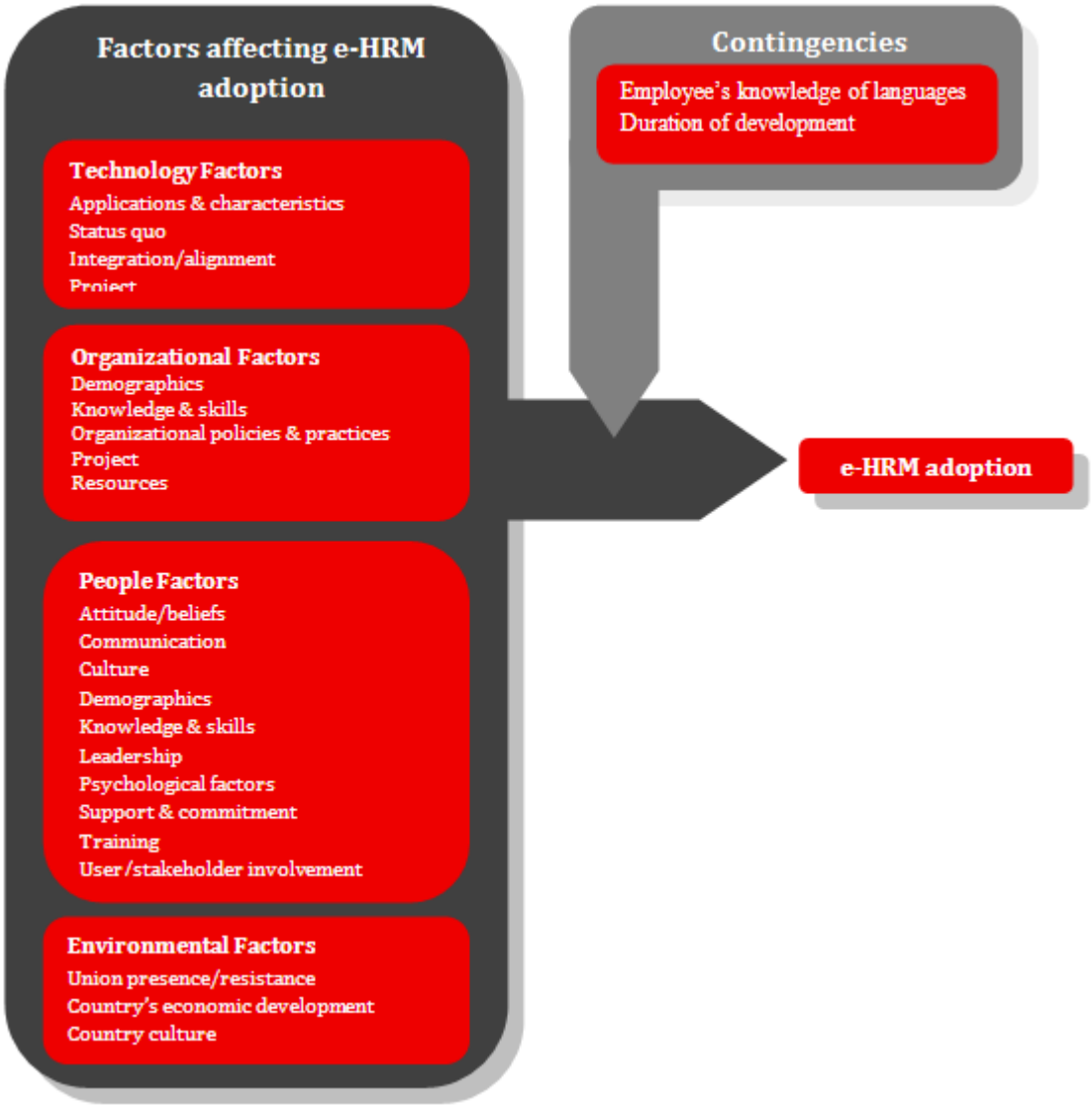

Figure 10: *Final contingency model: e-HRM adoption 1970 – 2010*

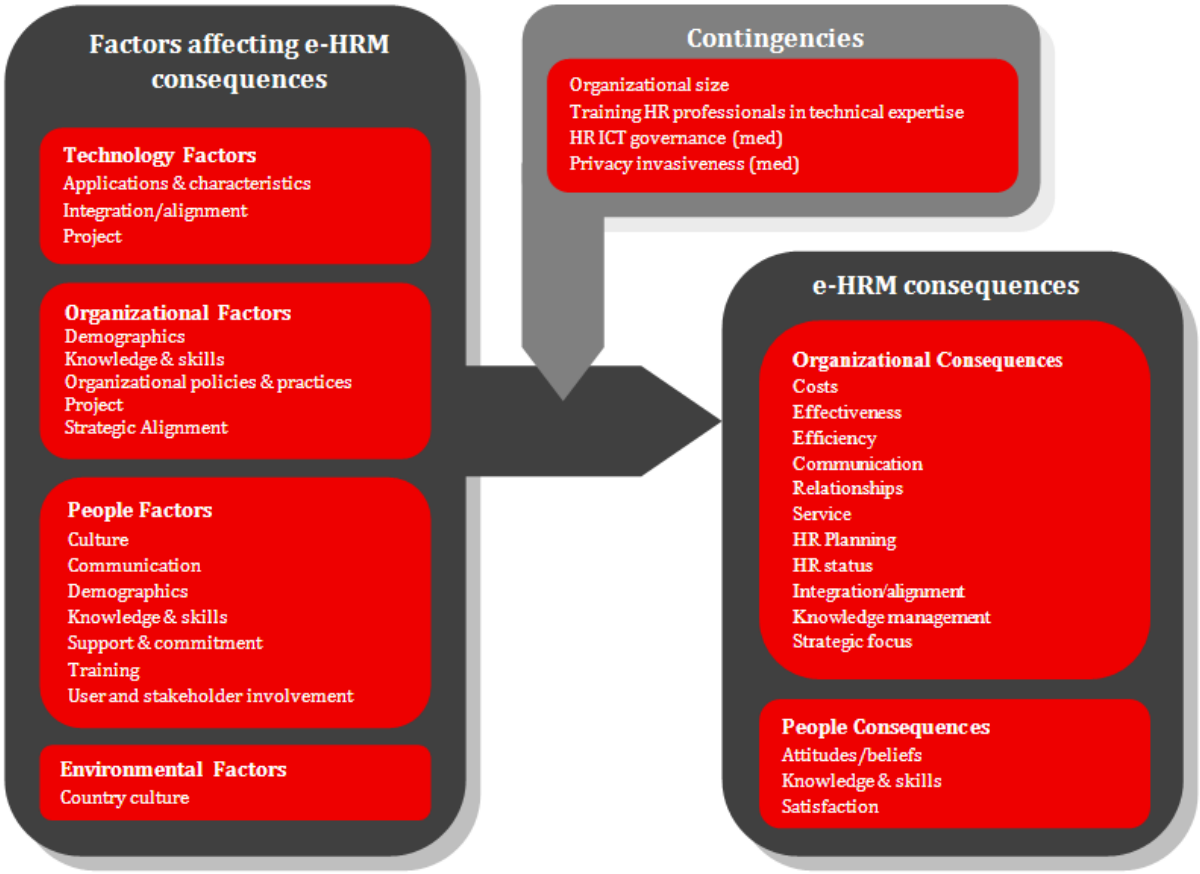

Figure 11: *Final contingency model: e-HRM consequences 1970 - 2010*

with HRIS. Considering the fact that e-HRM affects an organization as a whole, creating support and commitment is essential for success.

Fourth, when looking at consequences we also see a clear development. While scholars from the first two decades only report operational consequences, authors from the last decades increasingly present findings concerning relational consequences and in the last decade even transformational consequences. We think this development of transformational consequences can be linked to the switch in practice from HRIS, which is directed at the HR department itself, towards e-HRM, which concerns applications aimed at internal customers. While the initial HRIS certainly relieved the administrative burden of the HR professionals and left them with more time to spend on other tasks (e.g. relational tasks), with the arrival of e-HRM they lost even more operational tasks, leaving space for better service provision and even for a focus on strategic issues. This is in line with the earlier mentioned finding by Florkowski and Olivas-Luján (2006), who report that by the year 2000 the number of applications targeted at internal customers surpassed those targeted at HR staff. Thus, when we go back to e-HRM promises mentioned in the introduction, namely cost savings, improved HR services and strategic reorientation of the HR department, we can say that most of them were met or frequently met. Cost savings were often mentioned in empirical studies, though only one author provided numerical proof. It is therefore hard to say whether this promise is truly met. However, considering the great number of authors mentioning positive results regarding costs, we hold positive expectations.

Fifth, we showed that when important factors are considered e-HRM has the potential to enhance HR's professional stand. The field of HRM has been, and still is, under continuous criticism due to the fact that it is hard to prove the added value to business operations. Our review provided proof that e-HRM can add to organizational goals such as cost savings and it has the potential to enhance an organizations' competitive advantage by means of a strategic reorientation of the HR department. Scientifically, we can connect this thought to the so called 'resource-based view' of the firm, which states that organizations with unique internal resources which are hard to imitate by competitors can have a significant competitive advantage (Wernerfelt, 1984). An e-HRM system used to its full potential is, in our view, such a unique organizational resource.

Sixth, although the number and sophistication of factors do increase with each decade, major categories remain nearly the same. This indicates that scholars were aware of important implementation issues from the beginnings of e-HRM. However, we see that with each decade the categories are enriched with a greater number of relevant factors and more in-depth investigations of earlier mentioned factors. Thus we can say that with time, knowledge that was initially present is further explored en enriched.

Seventh, our review revealed a number of counterintuitive and remarkable findings. Especially Haines and Petit (1997) presented curious results. For instance, they showed that in-house development of e-HRM had no effect on user satisfaction, though one would expect that developing a system inside the organization would create more attachment of the users. The same holds for user involvement, where the authors reported an insignificant relationship to user satisfaction. One would expect higher satisfaction when users are involved in the development process, but these results do not support this. Haines and Petit (1997) also found that age did not influence e-HRM usage whereas one would hypothesize that older employees would be less willing to switch towards a new system. Additionally, the authors illustrated that different ways of training have different effects on satisfaction. The only significant positive relationships was found between in-house training and user satisfaction, which indicates that companies can better train employees themselves than hire an external trainer. Finally, another curious example is that an employee's experience in his present position negatively influences his satisfaction with the system (Haines & Petit, 1997). Why this effect occurs remains a question for future research but we propose that the longer an employee is working in his current position, the more resistant he will be towards change. Thus, taken together, the findings presented in our review are sometimes contrary to what one would expect and therefore offer interesting starting points for further clarification.

Eighth, our findings illustrated the effects of some important contingency factors. Contingency factors affecting adoption were found in the form of *duration of development* and *employees knowledge of languages*. Kossek et al. (1994) showed that user involvement is important in reaching adoption of e-HRM. However, the longer the development of a system took, the harder it was to maintain user involvement. Heikkilä and Smale (2010) reported the effects of language standardization for achieving certain positive or negative e-HRM results, but emphasized that whether positive or negative consequences prevail is dependent upon employees' knowledge of languages. If employees are knowledgeable regarding the language in which the system is standardized, positive results can be expected. However, when employees do not have the necessary knowledge this can lead to negative results.

Contingency factors were also presented for factors affecting consequences. As moderators we found *organizational size* and *training HR professionals on technical expertise.* As mediators we identified *privacy invasiveness* and *HR ICT governance.* Organizational size was reported by multiple studies as a determining factor but also as a moderator to certain effects. Chapman and Webster (2003) illustrated that organizational size moderated the relationship between developing an e-HRM system in-house versus buying off-the-shelf applications and the results an organization can achieve with e-HRM. For instance, small companies might benefit more from off-the-shelf applications since these were more economically viable for them. For large organizations it might be hard to implement packages since they mostly have hard to modify systems in place for which it takes a great investment to make them receptive to new extensions. Training HR professionals in their technical skills was mentioned by Hannon et al. (1996). According to the authors the amount of technical knowledge and skills of HR professionals was an important factor in achieving positive e-HRM results. However, the findings showed that if HR professionals lacked technical skills it decreased the chance that e-HRM could be used to its full potential, and more sophisticated goals like for instance the usage of e-HRM for strategic purposes were harder to achieve. This effect was moderated by training. Thus, whether or not HR professionals receive adequate technical training can influence the relationship between HR professionals' knowledge and e-HRM results.

Privacy invasiveness was mentioned by Lukaszewski et al. (2008). The authors reported that the relationship between system choice, or the extent to which employees can choose their HR system (e-HRM or face-to-face) and service satisfaction was mediated by invasiveness. If employees could choose their system and did not experience a high level of invasiveness, service satisfaction was higher. However, when invasiveness was experienced as high, employees rated their satisfaction as lower. Finally, Olivas-Luján and Florkowski (2010) found that HR ICT governance mediated the relationship between HR's absorptive capacity and the presence of an HR technology champion and human resource technology intensity in the sense that when governance of the HR system was also in hands of the IT department this was associated with a higher probability than an HR technology champion was present with a higher intensity of technology in HR.

In sum, we can say that the field of e-HRM has certainly progressed and with each decade we derived an increasing number of factors and consequences from the literature. Additionally, we found that with time more sophisticated goals of e-HRM, like for instance improved HR service and a strategic reorientation of the HR department, were increasingly reported in the literature. However, by outlining all factors we have seen that e-HRM does not in itself lead to certain consequences. In our view, it as an enabler that has the potential to simplify, support, facilitate and even enhance the quest for aimed goals. By means of this review we tried to enhance understanding of this phenomenon. However, our study also left e-HRM scholars with a number of avenues to explore.

4.2 Identified research gaps

First, as often mentioned, rigorous statistical studies were the minority. Most findings were derived from anecdotal evidence presented in case studies. Studies which present numerical findings, mostly do this in

percentages. For future research we propose that more studies should take the form of Haines and Petit's research (1997), whereby correlations were measured between certain factors and outcomes. Despite the fact that correlational studies do not provide evidence for causation, we think that it is first necessary to establish relationships before exploring their causality.

Second, although we did find a great number of factors, the factors were mostly mentioned in the literature as 'success factors', when positive, or 'barriers', when negative, without mentioning ways to execute the positive factors or remedy the barriers. Also, as mentioned earlier in the discussion, some curious effects remain vague. Thus, it is sometimes hard to verify in what way the factors contributed to success, which leaves us with another avenue for future research. For instance for a factor such as 'internal marketing' it could be useful to investigate what the most effective content or the most effective format would be in order to achieve successful adoption or other aimed goals.

Third, not one study we investigated mentioned implementation phases. For some factors, it could be important to know in what phase they should be used or tackled. For example, for the factor 'user involvement' one could ask: 'is user involvement necessary in a phase prior to the implementation, during the whole implementation process or especially at the end?'. This could be another prospective field of inquiry.

Fourth, the great majority of the investigated studies focused on e-HRM adoption. Research on the way consequences are achieved is still underrepresented. As e-HRM is a growing research field and still quite new in practice, we expect more research on this subject in the future and hope that this paper will stimulate it.

Fifth, e-HRM developed throughout the years from HRIS, to intranet based e-HRM, to internet-based e-HRM. However, in the literature in our sample this transition was not made explicit. Though it was mentioned as a factor in our review from the 90's where Haines and Petit (1997) found that the use of online applications was positively correlated with user satisfaction. For future research it would be interesting and important to investigate the effects of web applications versus local applications since both can have other implications. For instance the addition of internet-based applications can have serious consequences for privacy issues regarding personnel data.

Sixth, in line with the previous limitation, a lot of articles did not explicitly mention what applications they were investigating, like for instance recruiting applications or applications for performance appraisal. Thus, it is sometimes difficult to say whether factors influence all types of e-HRM applications, or just a few. This is, of course, also a limitation of our own study since we focused merely on articles on e-HRM and not on its functional areas. For the future it is important to establish a framework covering this aspect.

Seventh, concerning adoption, the level of analysis was underexposed in the literature and adoption was mostly mentioned in a general sense. Strohmeier and Kabst (2009) emphasized that e-HRM adoption is a multilevel phenomenon in the sense that one can speak of adoption on the individual level and adoption on an organizational level. However, this was hardly mentioned by scholars. Future research should pay attention to

the level of analysis in order to determine whether certain factors are important for individual or organizational adoption.

Eighth, we found that most research until now does not distinguish between different stakeholders. Research by Bondarouk et al. (2009-1) investigated e-HRM use by line managers and employees and found important differences between these two groups in use and attitudes towards e-HRM. Their finding and ours calls for increased use of a multi-stakeholder approach in future e-HRM research.

Ninth, research on 'environmental factors' is still very little. Although these factors are often hard to influence by an organization, it is important to clarify which of these have important implications for companies that are planning to implement e-HRM.

Tenth, and lastly, our contingency model comprises only a small number of investigated contingencies. However, we think more contingencies should be considered when adopting e-HRM or striving for certain goals. Future research should pay more attention to the conditions under which factors affect adoption or consequences. Organizational size, type of e-HRM and sector could be conditions to consider in future research. Most of these factors were investigated in a direct relationship with adoption or consequences but were not examined as contingencies yet.

4.3 Implications

Our research has implications for research and practice. We outline salient inferences in the next two sections.

4.3.1 Implications for research

A first implication for research is that on the basis of conducted research we clarified which empirical factors determine e-HRM success and provide an integrative framework including all factors and consequences as found in four decades of research. This was never done before. As mentioned in the introduction, research and practice still do not have a clear overview of what factors affect success or failure. By means of our literature review and related framework we tried to clarify what research knows up till know. Our review not only showed what was found, it also revealed gaps and thus avenues for future research. We hope that by presenting this overview our review and framework provide a starting point for future research.

Second, our study was based on empirical findings only. As mentioned in our introduction, until now scholars and practitioners did not have a clear overview of which factors were assumed to impact implementation versus factors which were empirically proven to have an impact on implementations. By reviewing all empirical literature we addressed the second issue. Whether factors mentioned in conceptual research also have true added value, could be a question for future research.

Third, research on e-HRM was traditionally scattered throughout distinct research disciplines such as information systems, HRM, psychology and management research. Our synthesis of the full body of empirical

knowledge on e-HRM integrates all these disciplines and therefore adds to all these research fields. Consequently, it can be used as a starting point for e-HRM researchers from different disciplines.

Fourth, we outlined the historical development of the field regarding factors and consequences and by doing so we showed what important changes the field has gone through. Different factors for adoption and consequences were mentioned over time and our review provides a clear overview of these changes. We also revived certain topics that might still be relevant today but have been left behind by scholars. For instance, we found *duration of computerization* as a factor affecting adoption in the 80's, though it was never investigated in later decades again. However, the duration of system implementation could still be an important factor today. Future research could address this issue.

Fifth, we clarified what contingencies were mentioned in the literature. Thus, we showed what conditions affect the relation between factors and either adoption or consequences. However, as outlined above, research on contingencies is still minor and more research is needed to identify more salient contingencies.

4.3.2 Implications for practice

First, as mentioned in the introduction, it is harder to construct a business case for e-HRM than for other information systems since there is still a discussion on whether HRM does contribute to the primary process or not. Often, effects are difficult to measure. In order to gain support, e-HRM advocates will need to quantify how e-HRM will improve business operations for different stakeholders. Our review and framework outlines empirically derived consequences of e-HRM implementations and thus provides consultants and other e-HRM advocates with a solid foundation for their business case.

Second, our study provides insight into what factors might lead to success or failures. Our framework can serve as a tool for practitioners to determine the chance for success is when considering to implement e-HRM in an organization. By checking what factors are present or not present in an organization practitioners can determine whether adoption is feasible, whether certain consequences could be achieved and what measures can be taken to enhance the chance for success.

A third implication, derived from research of Hempel (2004), concerns with implications for HR education. Hempel (2004) argued that, for HR professionals to adopt new technologies they need to know how to effectively work with them. The author further stated that traditional HR education falls short in increasing technical expertise and in this way fails to provide the necessary knowledge and skills to work in a technology enabled environment and to support the managerial climate for innovative organizations. In line with this finding, we found that technology knowledge can play an important role in affecting adoption and consequences. Next to increasing HR professional's technical knowledge, Hempel also outlined:

'HR is placed in a position of having to catch up with these (technology) innovations, and since the HR department is not driving these organizational and work-design changes, an additional layer of complexity is added. HR professionals will need a broader understanding of both the operational and strategic side of the business in order to effectively support these innovations' (Hempel, 2004. p. 166)

Thus, Hempel pleas for enriching the education of HR professionals with more technology and business related courses in order to better prepare them for their work in practice. When looking at the factors we found, we can certainly adhere to this reasoning. When HR professionals are better educated in these subject matters, we expect that aimed goals are more easily achieved.

4.4 Limitations

First, since we conducted a literature review we were limited by what other research had to offer us. Thus, our framework is solely based on factors and consequences that were investigated. However, there could be factors and consequences in practice which did not get the attention of research yet. We therefore encourage scholars to take our framework 'into the field' to investigate whether there are more factors and consequences which are currently overlooked. In a further section, we outline our own attempt to validate our framework in practice.

Second, we limited our sample purely to e-HRM research and did not include research on functional areas of e-HRM such as e-learning and e-recruitment. Although some authors do mention the investigated areas, our main interest was on e-HRM in general. By doing this we were able to keep a clear focus, though we took the risk of missing other unique findings. By investigating different functional areas, one could determine whether factors apply only to certain functional areas. Thus, future research should also investigate our found factors and consequences in relation to distinct functional areas and take a 'multi-functional area approach'.

Third, in line with the previous limitation, we also did not take research on other IT-implementations into account. The amount of research on other IT-implementations such as ERP (Enterprise Resource Planning) is much greater than research on e-HRM and is therefore much more developed. Knowledge from this research field could be applicable to e-HRM as well. However, to keep a clear focus we only considered research purely on e-HRM. Additionally, as mentioned in the introduction, e-HRM is developing as a distinct research field and our aim was to contribute to this specific field. Future scholars could investigate findings from other IT-implementations to determine whether the factors that were found relevant in this research also apply to e-HRM implementations.

Fourth, our findings are influenced by our own backgrounds. We conducted this research and provided definitions from a business perspective. However, information system researchers might provide other definitions and interpret the literature in a different way. For instance, the term *implementation* can have a different meaning and can include different phases for information system researchers than for business researchers. Thus, we encourage information system researchers and other disciplines concerned with e-HRM to validate our model from their own perspective and background.

4.5 Practical verification of framework

Since our framework was built on findings from literature and we wanted to enhance the practical relevance of the framework we subjected it to a practical verification. We verified our model by means of interviews with two expert business consultants in the field of e-HRM, an e-HRM software supplier and an HR professional of an

organization which had recently implemented e-HRM. All interviews were conducted in Dutch organizations. *Appendix E* shows our interview protocol (Dutch). Due to the fact that consequences of e-HRM, and especially relational and transformational consequences, manifest themselves a long time after the project has passed we were only able to verify our model concerning adoption. It is also important to note that it merely concerns a verification and not a practical validation.

Our interview consisted of open and closed questions. The open questions referred to the success of e-HRM and how the respondents defined it. Overall, we can say they agreed upon one broad definition:

'Reaching aimed goals'

The supplier explicitly mentioned: *'better, faster, cheaper'*. Also mentioned was that *e-HRM enabled the streamlining of processes*. Thus mostly focusing on operational consequences.

Then we asked what operational, relational and transformational consequences they observed in practice. The most frequent answer was that efficiency and effectiveness gains were relatively quickly reached and that HR service improved since HR professionals had more time for service related tasks. However, according to the respondents, cost savings and transformational consequences could only be observed when the e-HRM systems were running for a long time (2 to 3 years). Unfortunately, they had not yet observed such consequences themselves.

Next we asked them what factors they found as crucial for 'e-HRM success'. The respondents mentioned *the composition of the project team, the way in which the internal project team worked together, sector, organizational readiness(knowledge and skills)* and *having the current architecture clearly mapped* as important factors. Another curious response was that organizations should only *standardize the standard processes* while keeping exceptional situations non-computerized. Sector was mentioned in the sense that every sector in the Netherlands has its own collective bargaining agreement which can limit the adoption of e-HRM.

Other mentioned factors were *support from stakeholders* and *top management commitment*, but also factors relating to the business case, namely: *clearly outlining the added value of a system for management.* Finally, the supplier also mentioned a factor for the implementation project and said that a *system should be implemented for the whole organization* in order to achieve benefits such as cost savings. Implicitly, the supplier meant that it mostly only feasible to implement e-HRM when an organization exceeds a certain *size*.

Subsequently, we arrived at our closed question-section. Here we showed the respondents our framework including all factors affecting adoption from 2000 till 2010 and asked them to rate the factors. Specifically, we asked them to mark a factor with a + when they agreed upon the effect of the factor, a – when they did not agree and a 0 when they did not have any experience with the factor.

Overall, we found strong support for our adoption framework. There were however, some factors where we found overly negative responses. For instance the factors *availability of pc's* and *expertise with HRIS*, were marked as 'do not agree' by three respondents or more. Also, we found that almost all factors pertaining to the

implementation project category were positively marked, thus emphasizing the importance of this category for practitioners. In accordance with our previous statements, we found that the people factors were most positively rated by respondents which means that they saw these factors as most important for the successful adoption of e-HRM.

Finally, we also found a number of differences between respondents of different groups but also between the two expert business consultants. Thus highlighting the fact that not all practitioners agree upon the importance of certain factors for adoption. This once again underpins that there is still disagreement and uncertainty about which factors constitute to successful e-HRM adoption and also supports the earlier mentioned implications and added value of our research. However, our framework should be subjected to a rigorous empirical validation, before we can draw solid conclusions. Nevertheless, our practical validation has provided additional support for our findings and has given extra input for future research.

5. Conclusion

This paper aimed at identifying the most important factors affecting e-HRM success in the last four decades and providing a comprehensive synthesis of findings as a guide for practitioners and a starting point for future research. Based on a great number of factors and consequences we created a framework derived from merely empirical studies. In our inquiry we discovered two salient research streams, namely research on factors affecting e-HRM adoption and factors affecting e-HRM consequences. Within these distinct, but not mutually exclusive, streams we also found four categories of factors namely: technical, organizational, people and environmental. Although we derived a small number of contingencies in both streams, these were proven as important mediators or moderators to certain relationships. Additionally, two distinct categories of consequences were revealed: organizational and people consequences.

Further, our results show that success is a term not easily quantified. It depends on the organizational goals and the achievement of those goals whether one can speak of successful e-HRM or not. Also, when taking the numerous factors into account, we can say e-HRM is not a holy grail in itself. Companies need to be willing to address important issues and when they do e-HRM can have considerable benefits and even has the potential to add to an organization's bottom line. Likewise, we found that traditional e-HRM promises like cost savings, improvement of HR services and strategic reorientation of the HR department are definitely met in certain cases. However, success for the organization is not by definition success for the different groups of users. It is therefore necessary for future research to take a multi-stakeholder perspective in the investigation of successful e-HRM.

Also, our study resulted in lots of new implications and provided interesting food for thought for diverse disciplines engaged in e-HRM research. Due to the scattered nature of the field, a comprehensive synthesis of factors and consequences was called for by several leading scholars for a long time. By including all publications of e-HRM, we were able to fill this gap. In addition, our framework is useful for practitioners who try to build a solid business case or try to investigate what the chances of success are when considering to implement e-HRM in certain organizations.

Unfortunately, we were limited by conducted research and by our own research method, which means our framework is not conclusive. As often said, rigorous statistical studies are still uncommon which means that the strengths and causality of relationships remain unclear. However, by offering this empirical synthesis we provided a sound starting point for future researchers motivated to clarify all the mysteries left in the field of e-HRM.

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Appendix A. Search queries and number of results

	Number of results	
Search Query	*Web of Science*	*Scopus*
e-HRM	8	30
eHRM	6	10
e-HR	39	71
Electronic HRM	16	39
Electronic Human Resource Management	62	402
Online HRM	6	15
Online Human Resource Management	26	158
Web HRM	9	20
Web Human Resource Management	99	387
Web based HRM	5	12
Web based Human Resource Management	61	132
HRIS	136	39
Human Resource Information Systems	689	1847
HRIT	3	1
Human Resource Information Technology	397	1193
Virtual HRM	8	9
Virtual Human Resource Management	55	84
Digital HRM	5	4
Digital Human Resource Management	31	112
Computer Based Human Resource Information Systems	28	395
Total:	***1689***	***4960***
	Grand total: 6649	

Appendix B. e-HRM literature analyzed

	Author	Year	Title
1	Mayer, S.J.	1971	EDP Personnel Systems: What areas are being automated
2	Tomeski, E.A., Lazarus, H.	1974	Computerized Information Systems in Personnel - Comparative Analysis of state of the art government and business
3	Mathys, N., LaVan, H.	1982	A survey of the human resource information systems (HRIS) of major companies
4	Magnus, M., Grossman, M.	1985	Computers and the personnel department
5	DeSanctis, G.	1986	Human-Resource Information Systems - A current assessment
6	Taylor, G.S., Davis, J.S.	1989	Individual Privacy and Computer-Based Human Resource Information Systems
7	Broderick, R., Boudreau, J.W.	1992	The evolution of computer use in human resource management: Interviews with ten leaders
8	Mathieson, K.	1993	Variations in user definitions of an Information System
9	Kossek, E.E., Young, W., Gash, D.C., Nichol, V.	1994	Waiting for innovation in the human resources department - Godot implements a Human Resource Information System
10	Martinsons, M.G.	1994	Benchmarking Human Resource Information Systems in Canada and Hong-Kong
11	Hannon, J., Jelf, G., Brandes, D.	1996	Human resource information systems: Operational issues and strategic considerations in a global environment
12	Sturman M.C., Hannon J.M., Milkovich G.T.	1996	Computerized decision aids for flexible benefits decisions: The effects of an expert system and decision support system on employee intentions and satisfaction with benefits
13	Haines V.Y., Petit A.	1997	Conditions for successful human resource information systems
14	Powell T.C., DentMicallef, A.	1997	Information technology as competitive advantage: The role of human, business, and technology resources
15	Hubbard, J.C., North, A.B., Arjomand, H.L.	1997	Making the right connections: Perceptions of human resource personnel directors concerning electronic job-search methods
16	Eddy, E.R., Stone, D.L., Stone-Romero, E.F.	1999	The effects of information management policies on reactions to human resource information systems: An integration of privacy and procedural justice perspectives
17	Martinsons, M.G., Chong, P.K.C.	1999	The influence of human factors and specialist involvement on information systems success
18	Elliott, R.H., Tevavichulada, S.	1999	Computer literacy and human resource management: A public private sector comparison
19	Tansley, C., Watson, T.	2000	Strategic exchange in the development of Human Resource Information Systems (HRIS)
20	Svoboda, M., Schroder, S.	2001	Transforming human resources in the new economy: Developing the next generation of global HR managers at Deutsche Bank AG
21	Ball, K.S.	2001	The use of human resource information systems: a survey
22	Tansley, C., Newell, S., Williams, H.	2001	Effecting HRM-style practices through an integrated human resource information system - An e-greenfield site?
23	Jones, J.W., Brasher, E.E., Huff, J.W.	2002	Innovations in integrity-based personnel selection: Building a technology-friendly assessment
24	Neary, D.B.	2002	Creating a company-wide, on-line, performance management system: A case study at TRW Inc.
25	Hagood, W.O., Friedman, L.	2002	Using the balanced scorecard to measure the performance of your HR information system
26	Gardner S.D., Lepak D.P., Bartol K.M.	2003	Virtual HR: The impact of information technology on the human resource professional
27	Stanton, J.M., Weiss,	2003	Organisational databases of personnel information: contrasting the

	E.M.		concerns of human resource managers and employees
28	Chapman, D.S., Webster, J.	2003	The Use of Technologies in the Recruiting, Screening, and Selection processes for Job Candidates
29	Hempel, P.S.	2004	Preparing the HR profession for technology and information work
30	Ruël, H.J.M., Bondarouk,T.V., Looise, J.K.	2004	E-HRM: Innovation or Irritation : An Explorative Empirical Study in Five Large Companies on Web-based HRM
31	Potosky, D., Bobko, P.	2004	Selection testing via the Internet: Practical considerations and exploratory empirical findings
32	Buckley, P., Minette, K., Joy, D., Michaels, J.	2004	The use of an automated employment recruiting and screening system for temporary professional employees: A case study
33	Singh, V., Point, S.	2004	Strategic responses by European companies to the diversity challenge: An Online comparison
34	Hustad, E., Munkvold, B.E.	2005	IT-supported competence management: A case study at Ericsson
35	Bell, B.S., Lee, S.W., Yeung, S.K.	2006	The impact of e-HR on professional competence in HRM: Implications for the development of HR professionals
36	Cronin, B., Morath, R., Curtin, P., Heil, M.	2006	Public sector use of technology in managing human resources
37	Florkowski, G.W., Olivas-Lujan, M.R.	2006	The diffusion of human-resource information-technology innovations in US and non-US firms
38	Hooi, L.W.	2006	Implementing e-HRM: The Readiness of Small and Medium Sized Manufacturing Companies in Malaysia
39	Ngai, E.W.T., Wat, F.K.T.	2006	Human resource information systems: a review and empirical analysis
40	Alleyne, C., Kakabadse, A., Kakabadse, N.	2007	Using the HR intranet - An exploratory analysis of its impact on managerial satisfaction with the HR function
41	Hussain, Z., Wallace, J., Cornelius, N.E.	2007	The use and impact of human resource information systems on human resource management professionals
42	Panayotopoulou, L., Vakola, M., Galanaki, E.	2007	E-HR adoption and the role of HRM: evidence from Greece
43	Ruël, H.J.M, Bondarouk, T.V., Van der Velde, M.	2007	The contribution of e-HRM to HRM effectiveness: Results from a quantitative study in a Dutch Ministry
44	Tansley, C., Newell, S.	2007	A knowledge-based view of agenda-formation in the development of human resource information systems
45	Olivas-Lujan, M.R., Ramirez, J., Zapata-Cantu, L.	2007	e-HRM in Mexico: adapting innovations for global competitiveness
46	Voermans, M., Van Veldhoven, M.	2007	Attitude towards E-HRM: an empirical study at Philips
47	Teo, T.S.H., Lim, G.S., Fedric, S.A.	2007	The adoption and diffusion of human resources information systems in Singapore
48	Beulen, E.	2008	The enabling role of information technology in the global war for talent: Accenture's industrialized approach
49	Bondarouk, T.V., Ruël, H.J.M.	2008	HRM systems for successful information technology implementation: evidence from three case studies
50	Haines, V.Y., Lafleur, G.	2008	Information technology usage and human resource roles and effectiveness
51	Lukaszewski, K.M., Stone, D.L., Stone-Romero, E.F.	2008	The Effects of the Ability to Choose the Type of Human Resources System on Perceptions of Invasion of Privacy and System Satisfaction
52	Ngai, E.W.T., Law, C.C.H., Chan, S.C.H., Wat, F.K.T.	2008	Importance of the internet to human resource practitioners in Hong Kong

53	Beulen, E.	2009	The contribution of a global service provider's Human Resources Information System (HRIS) to staff retention in emerging markets Comparing issues and implications in six developing countries
54	Bondarouk, T.V., Ruël, H.J.M, van der Heijden, B.	2009	e-HRM effectiveness in a public sector organization: a multi-stakeholder perspective
55	Ruta, C.D.	2009	HR portal alignment for the creation and development of intellectual capital
56	Morris, S.S., Wright, P.M., Trevor, J., Stiles, P., Stahl, G.K., Snell, S., Paauwe, J., Farndale, E.	2009	Global Challenges to replicating HR: The role of people, processes and systems
57	Parry, E., Wilson, H.	2009	Factors influencing the adoption of online recruitment
58	Strohmeier, S., Kabst, R.	2009	Organizational adoption of e-HRM in Europe An empirical exploration of major adoption factors
59	Imperatori, B., Bissola, R.	2009	Generation Y & team creativity: The strategic role of e-HRM architecture
60	Oiry, E.	2009	Electronic human resource management: Organizational responses to role conflicts created by e-learning
61	Payne, S.C., Horner, M.T., Boswell, W.R., Schroeder, A.N., Stine-Cheyne, K.J.	2009	Comparison of online and traditional performance appraisal systems
62	Reddick, C.G.	2009	Human Resources Information Systems in Texas City Governments: Scope and Perception of its Effectiveness
63	Smale, A., Heikkilä, J.P.	2009	IT-Based Integration of HRM in a Foreign MNC Subsidiary: A Micro-Political Perspective
64	Wilson-Evered, E., Hartel, C.E.J.	2009	Measuring attitudes to HRIS implementation: A field study to inform implementation methodology
65	Barut, O., Dogerlioglu, O.	2010	Human Resources Information Systems: A sociotechnical perspective
66	Guechtouli, M.	2010	E-HRM's impact on an environment scanning process: how can technology support selection of information
67	Martin, G., Reddington, M.	2010	Theorizing the links between e-HR and strategic HRM: a model, case illustration and reflections
68	Olivas-Lujan, M.R., Florkowski, G.W.	2010	Does IT governance matter in e-HRM?
69	Heikkilä, J.-P., Smale, A.	2010	The effects of 'language standardization' on the acceptance and use of e-HRM systems in foreign subsidiaries

Appendix C. Methods and samples in investigated literature

	Author	Year	Method	Sample
1	Mayer, S.J.	1971	Quantitative	375 major US corporations (Random)
2	Tomeski, E.A., Lazarus, H.	1974	Quantitative	12 federal departments, 22 states, 15 counties, 24 cities, 17 private organizations
3	Mathys, N., LaVan, H.	1982	Quantitative	75 private sector companies (37 manufacturing, 5 Retail & Wholesale, 14 Finance, 9 Utilities, 10 Transportation.
4	Magnus, M., Grossman, M.	1985	Quantitative	1000 US personnel journal subscribers. Most work in manufacturing, finance or healthservices. Titles included: CEO/owner/partner/corporate officer/vice president (15%), director (22,9%), manager (39,5%), administration/supervisor/officer (14,3%) and specialist/analyst/ assistant or consultant (8,3%).
5	DeSanctis, G.	1986	Quantitative	171 members of the Association of Human Resource System Professionals (HRSP, Inc). All major industries were represented in the sample, including manufacturing, banking, insurance, transportation, communications, construction, retailing, education, and services. The typical respondent to the survey was a "manager of HRIS," but vice presidents, directors, and supervisors within personnel, and those in charge of compensation and benefits, also completed the survey.
6	Taylor, G.S., Davis, J.S.	1989	Quantitative	223 undergraduate business management students took part in the study; 100 (45%) were female and 123 (55%) were male.
7	Broderick & Boudreau	1992	Qualitative	Case studies of 10 Fortune 500 companies considered 'leaders' in HRIS usage (explorative interviews with top HR Manager, HRIS Manager, Representatives from HRIS staff, Information Systems, Finance or other areas who regularly worked with the HRIS and analyses of documents).
8	Mathieson, K.	1993	Quantitative	Survey of 78 users of a university HRIS
9	Kossek et al.	1994	Qualitative	Longitudinal case study. Data were collected over several years on 2 different times. Surveys, interviews, and reviews of company documents were used. 26% were from corporate, 74% were from field locations. 23% were managers and 77% were hr professionals or staff. 72% were experienced (moderate or expert) users.
10	Martinsons, M.G.	1994	Quantitative	118 Canadian respondents, 361 Hong Kong respondents
11	Hannon, J., Jelf, G., Brandes, D.	1996	Mixed method	14 US-based MNCs (executives). 14 telephone interviews, and 11 in-depth questionnaires
12	Sturman et al.	1996	Quantitative	Experimental design in field setting. 80 employees of a fortune 500 company. Random assignment to 3 conditions.
13	Haines & Petit	1997	Quantitative	Survey of 152 members of the Canadian Association of Human Resource Systems Professionals (CHRSP). This were users who interact directly woth a computer-based HRIS to do their work.
14	Powell & Dent-Micallef	1997	Quantitative (mainly)	65 surveys of CEOs or senior executives in retail industry. (research also had additional phases for validity checks).
15	Hubbard et al.	1997	Quantitative	Survey of 32 HR/PD's from top 100 privately owned companies in Georgia on their perceptions of job-search methods.
16	Eddy et al.	1999	Quantitative	124 employed persons enrolled in an MBA course. Experimental design (treatment: reading one of 4 policies/measurement: questionnaire): 31 subjects per condition
17	Martinsons & Chong	1999	Quantitative	Field study in East and South-East Asia. 67 questionnaires derived from people responsible for HRM on the enterprise-level. A

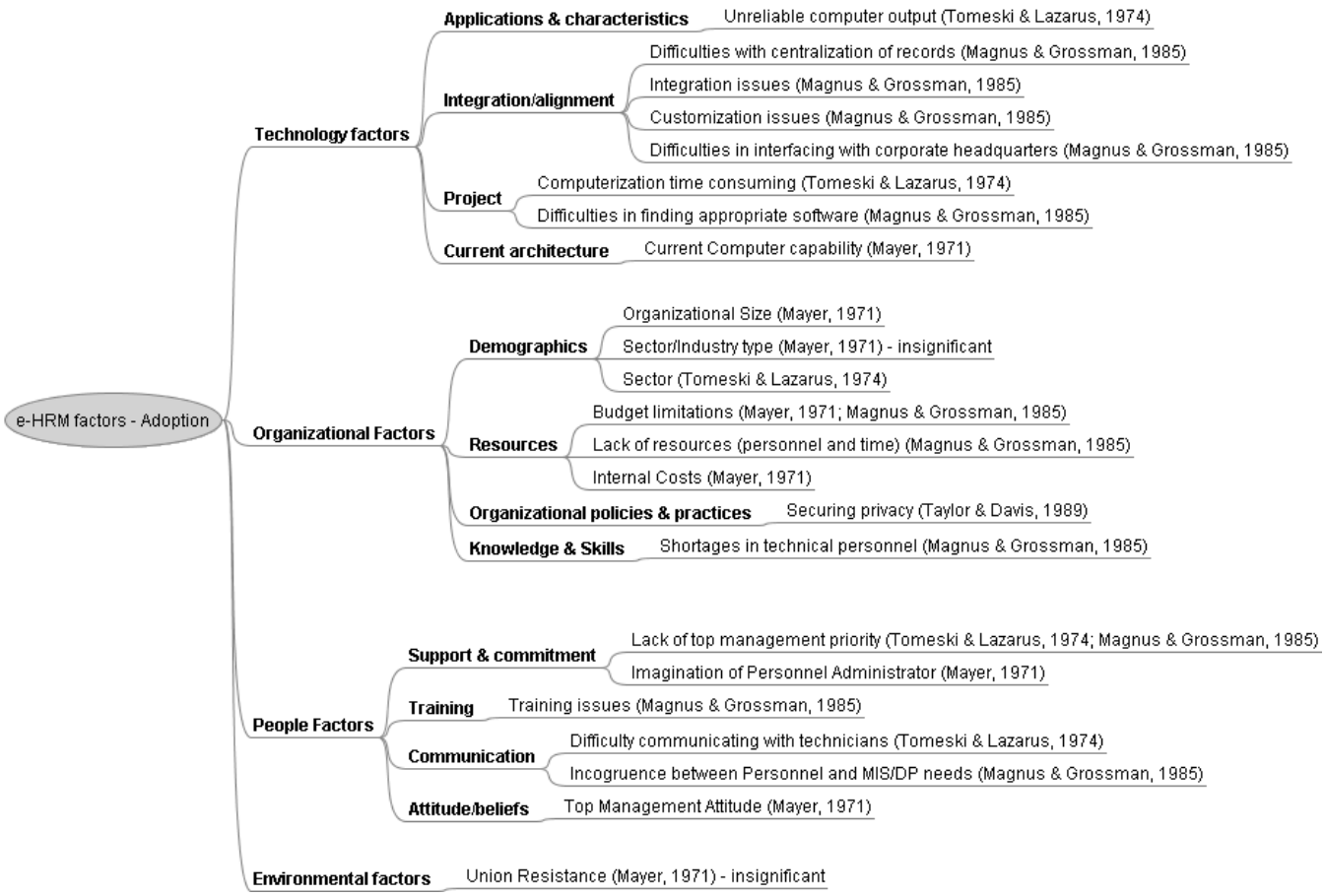
				second questionnaire for the manager whose department was most directly affected by the most recently adopted computer based IS (61 of earlier 67).
18	Elliott & Tevavichulada	1999	Quantitative	154 questionnaires of HR professionals in public (n=77) and private (n=77) sector companies.
19	Tansley & Watson	2000	Mixed Method	2 year ethnographic/case study (observations, 10 interviews, document analysis, field notes etc.) of HR and IS managers working on a three year global HRIS project for an American corporation (80,000 employees, 60 countries) active in different industries (food ingredient processing, agricultural commodity trading, financial risk management and technical services) .
20	Svoboda & Schröder	2001	Case description	Not described
21	Ball	2001	Quantitative	Survey of 115 organizations from the Financial Analysis Made Easy (FAME) database into their usage of HRIS applications for different HR activities
22	Tansley et al.	2001	Mixed Method	Case study of a large UK engineering company (40.000 employees) implementing the HRIS element of an ERP system (SAP).
23	Jones et al.	2002	Quantitative	The paper discusses several quantitative studies in which an employee selection system (API) is validated
24	Neary	2002	Case description	Case description of a US-based multinational company called TRW (active in automotive, aeronautical systems, space and electronics, and information systems) with 100.000 employees on developing a uniform performance appraisal system.
25	Hagood & Friedman	2002	Case description	Case description of CIA's development and implementation of a balanced scorecard-based performance measurement system for its HRIS to justify costs and highlight the effectiveness of the system.
26	Gardner et al.	2003	Quantitative	Survey of 357 HR Professionals and 357 HR Executives on the way IT impacted their jobs.
27	Stanton & Weiss	2003	Qualitative	2 studies on employee monitoring and surveillance techniques. One from perspective of Managers (responsible for HR). One from perspective of employees themselves. These were then contrasted to find overlapping or contradicting results.
28	Chapman & Webster	2003	Quantitative	Web-based survey of HR Managers (members of the Society for Human Resource Management (SHRM)) representing 125 organizations in the US on the use of technologies in the recruiting, screening and selection processes for job candidates.
29	Hempel	2004	Qualitative	Examination of 22 Masters degree programs to investigate HR education on the 'technology aspect'. Data consisted of: information of courses from the internet or from information requested from lecturers.
30	Ruël et al.	2004	Mixed Method	Case study (conversational interviews, documents, observations) of 5 large (>15.000) organizations
31	Potosky & Bobko	2004	Quantitative	Experiment of 65 adult students (91 % employed) on a comparison between cognitively oriented selection tests administered via paper-and-pencil vs tests administered via the internet.
32	Buckley et al.	2004	Mixed Method	Case study of 14 educational publishers in the US on their introduction of a computerized applicant recruitment and screening system.
33	Singh & Point	2004	Mixed Method	Discourse analysis on how 241 leading companies in 8 European countries explain (what are their drivers) and promote their diversity management policies on their websites.
34	Hustad & Munkvold	2005	Mixed Method	700 employees at (mainly the Norwegian branch of) Ericsson. 2/3 working on R&D department. (semi-structured interviews and document analysis with key users during 5 months).
35	Bell et al.	2006	Qualitative	Interviews were conducted with HR representatives from 19 Fortune 500 companies to examine the linkage between electronic

				human resources (e-HR) and the reshaping of professional competence in HRM
36	Cronin et al.	2006	Qualitative	Benchmarking study by means of interviews with 20 HR professionals working in federal agencies.
37	Florkowski & Olivas-Lujan	2006	Quantitative	Survey research with HR managers and executives of 216 large (500+) companies in the US, Canada, UK and Ireland on the diffusion of HRIT. Specifically it was investigated if the diffusion was caused by internal forces, external forces or hybrid.
38	Hooi, L.W.	2006	Quantitative	Surveys, Interviews, Observations of 60 Malaysian employees in manufacturing SME's(<250 employees). 21% were public limited companies.
39	Ngai & Wat	2006	Quantitative	Survey of 147 HR practitioners in Hong Kong.
40	Alleyne et al.	2007	Mixed Method	Case study of a customer service division of a large subsidiary of a major telecommunications organization which had developed and implemented a company-wide HR intranet. The population consisted of HR managers and HR customers.
41	Hussain et al.	2007	Mixed Method	Survey of 101 HR professionals and interviews with 11 senior executives (to whom the HR professionals reported) working in small-and-medium sized and large UK organizations.
42	Ngai et al.	2008	Quantitative	Survey of 147 HR practitioners in Hong Kong on their perceptions of the importance of internet for HRM.
43	Panayotopoulou et al.	2007	Mixed Method	Research on e-HR adoption in Greece by means of focus groups and questionnaires. A total of 76 questionnaires were returned. For the focus groups 3 HR managers from the following sectors were invited: manufacturing, banking and telecommunications.
44	Ruël et al.	2007	Quantitative	On-line questionnaire of 100 operational employees, managers and HR professionals in the Dutch ministry of internal affairs.
45	Tansley & Newell	2007	Qualitative	Ethnographic narrative study of an IS and HR manager working in a North-American owned corporation of over 80.000 employees during the agenda setting stage of a global HRIS implementation. Over a two-year period the researchers observed 12 global HRIS team meetings. The meetings were about the design, spcification and procurement of a $15 million HRIS with a global data warehouse and country-specific integrated employee databases.
46	Olivas-Lujan et al.	2007	Qualitative	Case studies of 4 large Mexican owned firms from 4 different sectors (food and beverages, financial and commercial services, production and distribution of construction materials, information technology and BPO(business process outsourcing) which have been competing with globally operating companies in Mexico and in the global market for at least a decade. Semi-structured interviews with Senior HR managers were conducted. Sometimes line managers and employees were also interviewed.
47	Voermans & van Veldhoven	2007	Quantitative	Online questionnaires of 99 managers and 257 employees within Philips (Electronics) Netherlands.
48	Teo, T.S.H., Lim, G.S., Fedric, S.A.	2007	Quantitative	Questionnaire of 110 companies in Singapore
49	Beulen, E.	2008	Qualitative	Case study of 16 HR executives at Accenture (a global management consulting, technology services, and outsourcing company with 175.000 in 49 countries) on the way in which HRIS supports them in their HR tasks.
50	Bondarouk & Ruël	2008	Qualitative	3 case studies (structured interviews, field notes and document analysis) of a hospital, an insurance company and a university. 83 interviews were conducted with managerial employees responsible for strategic policymaking in the companies, members of the IT project teams, and end-users of the systems.
51	Haines & Lafleur	2008	Quantitative	Survey research of 210 senior HR executives at leading Canadian corporations.

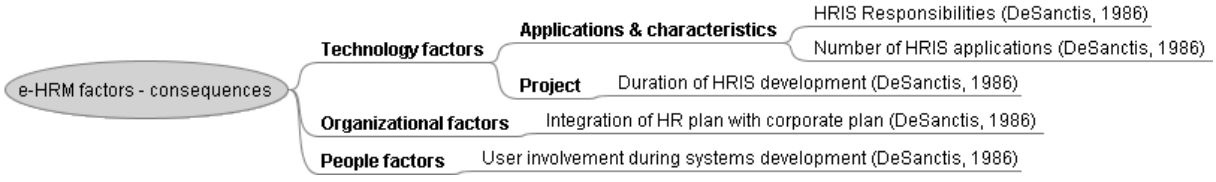
52	Lukaszewski et al.	2008	Quantitative	2 experimental studies. Using a 2x2 experimental design the researchers examined the effects of (a) ability to choose the type of HR system to which data would be disclosed (choice vs. no choice), and (b) type of information disclosed (medical vs. non-medical) on invasiveness and service satisfaction. Study 1 used 71 employed participants. Study tested the same hypotheses with 68 employed participants. The only difference was that the system choice manipulation (HRIS vs face-2-face HR system was different.
53	Beulen, E.	2009	Qualitative	Case study of 16 HR executives at Accenture (a global management consulting, technology services, and outsourcing company with 175.000 in 49 countries). The executives and managers interviewed work for the company's Argentina, Brazil, China, India, Latvia and Slovakia branches (3 emerging continents). The main purpose was to explore how the HRIS supported Accenture's efforts in retention management.
54	Bondarouk et al.	2009	Qualitative	21 interviews on a career development tool were conducted at the Ministry of the Interior and Kingdom Relations in The Netherlands: 10 with line managers and 11 with employees.
55	Ruta, C.D.	2009	Qualitative	Case study of a leading international consulting firm on the implementation of an advanced HR portal and the way it contributes to intellectual capital creation, maintenance and leverage.
56	Morris et al.	2009	Mixed Method	Case study (semistructured interviews, internal publications, media reports, and other published sources) of HR unit managers of 20 multinational companies in the United Kingdom (6), Continental Europe (6), Asia-Pacific (5), and the United States (2). Then a survey of 263 HR Managers was conducted to test hypotheses. Hypotheses were tested on the basis of Structural Equation Modeling.
57	Parry & Wilson	2009	Quantitative	On the basis of a literature review the authors developed a hypothesized list of factors affecting the adoption of online recruitment. Then, 14 semi-structured interviews were held with UK HR managers in order to check the list of factors and add factors not discussed in the literature. These factors were then used to conduct a survey of 439 HR managers and directors to investigate which factors were associated with percentage of vacancies advertised via the corporate website or commercial job boards.
58	Strohmeier & Kabst	2009	Quantitative	Large scale survey of senior HR managers in 2336 organizations in 23 European countries to examine which general and contextual factors influence cross-national organizational adoption of e-HRM.
59	Imperatori & Bissola	2009	Quantitative	Experiment ogf 1078 undergraduate students attending courses of Organizational Design, HRM and Organisational Behaviour at Catholic University in Milan. They formed 98 eleven people-groups, which were in charge of performing a creative product.
60	Oiry, E.	2009	Qualitative	4 case studies in French banking with advanced experience of blended learning (e-learning and face-2-face) on the role conflicts arising from this type of learning. 15 interviews were conducted (with training managers (4), e-learning project manager (4), union representative (1), direct manager (1), employees who had undergone the training (2), members of training department (2) and an expert in the development of e-learning in France (1).
61	Payne et al.	2009	Quantitative	Quasi-experimental study on employee's reactions to the use of an online performance appraisal (PA) system and the traditional paper-and-pencil (P&P) approach. Reactions of a group of 83 employees evaluated with the P&P approach and 152 employees evaluated with the online system were compared.
62	Reddick, C.G.	2009	Quantitative	Survey of 88 Human Resource Directors in Texas city

				governments in the US on the scope and perception of effectiveness of HRIS.
63	Smale & Heikkilä	2009	Qualitative	A longitudinal, in-depth case study approach was used, and followed the integration of a global e-HRM system in the Finnish subsidiary of a large European-owned MNC over a period of nearly two years. Qualitative data was collected via semi-structured interviews with key subsidiary HR personnel and managers and was complemented with company documentation. Specifically the study's analytical focus is on issues of process—in this case the process of negotiation between HQ and subsidiaries during the IT-based integration of HRM and the involvement of key actors (micro-political approach).
64	Wilson-Evered & Hartel	2009	Quantitative	Staff opinion survey of HR staff and line managers in five hospital districts directly involved in the implementation of HR/payroll integrated HRIS (34 respondents) and an automated rostering system (26 respondents) on the key determinants of successful information systems implementation.
65	Barut & Dogerlioglu	2010	Quantitative	Survey of employees working in HR departments (81% HR managers or directors) of 31 organizations with an average of 1849 employees and 1,652 USD turnover on the relationship between using a sociotechnical approach and successfactors and consequences of HRIS implementations.
66	Guechtouli, M.	2010	Qualitative	Case study of Gama, an organization with more than 5000 employees, on the way an IT system (the Weekly) supports their environmental scanning (ES) procedures. Interviews were conducted with 5 managers. Also, company documentation was analyzed.
67	Martin & Reddington	2010	Mixed Method	Case study of an e-HR implementation in two strategic business units of a UK-based leading global oilfield services provider. There were two stages of data collection. The first stage comprised of a web-based survey of 41 line managers (26 from SBU A and 17 from B). The survey was then followed up by 9 in-depth interviews with line managers (6 from A, 3 from B).
68	Olivas-Lujan, M.R., Florkowski, G.W.	2010	Quantitative	Web-based survey of 136 US and Canadian firms on the influence of IT governance arrangements regarding intensity of usage of e-HRM (+19 respondents who did not indicate country). 116 had positions in HR area and 60% worked at higher management levels.
69	Heikkilä & Smale	2010	Qualitative	18 in depth-interviews with subsidiary HR managers from 2 European MNCs on the effects of language standardization on the acceptance and use of e-HRM systems.

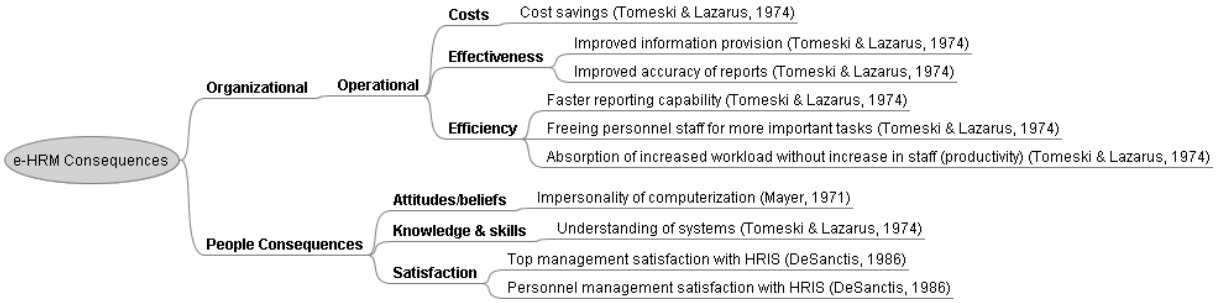
Appendix D. **Mind maps -1970 - 2010**



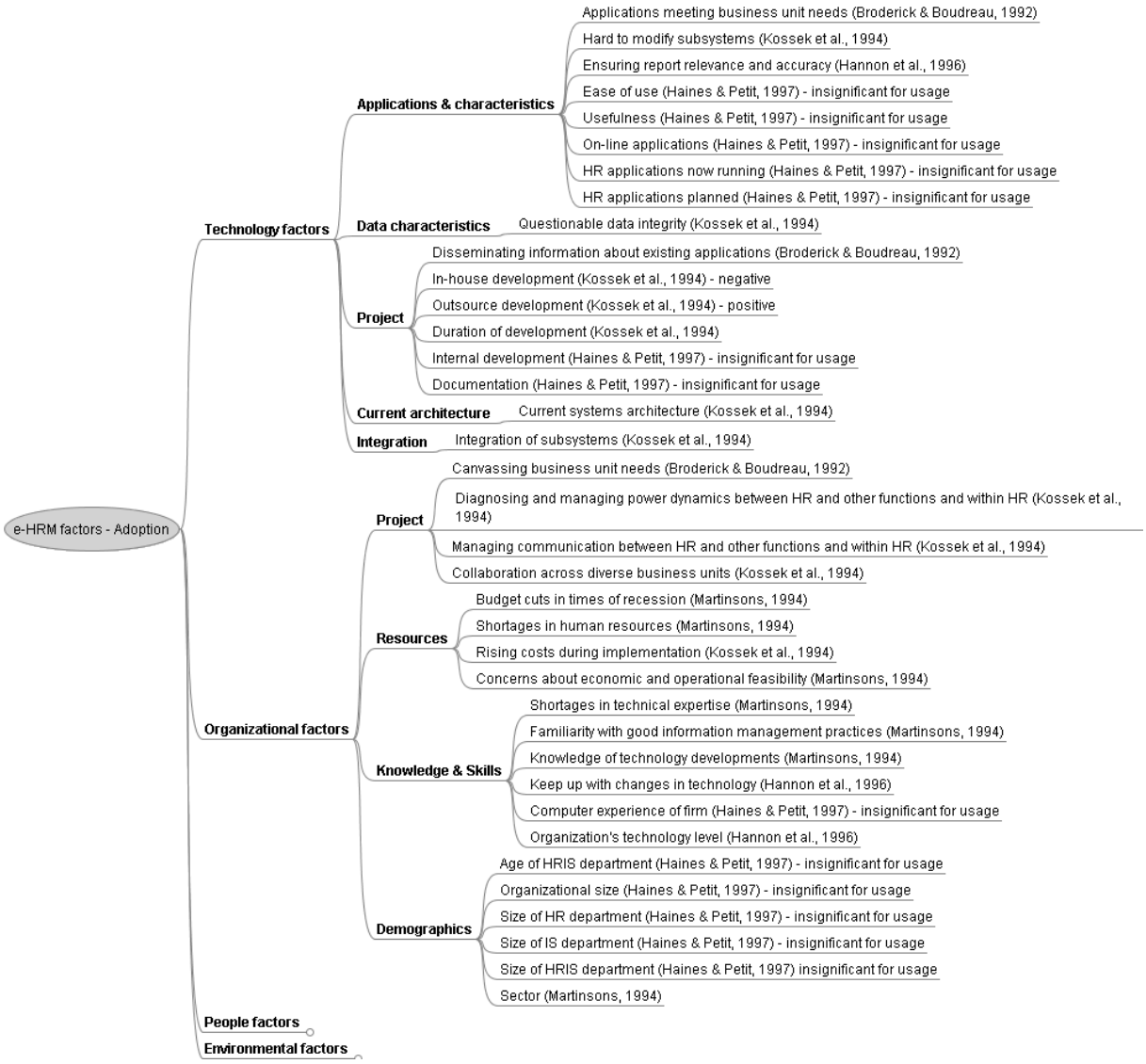
Mind map 1. Factors affecting adoption 1970 1989



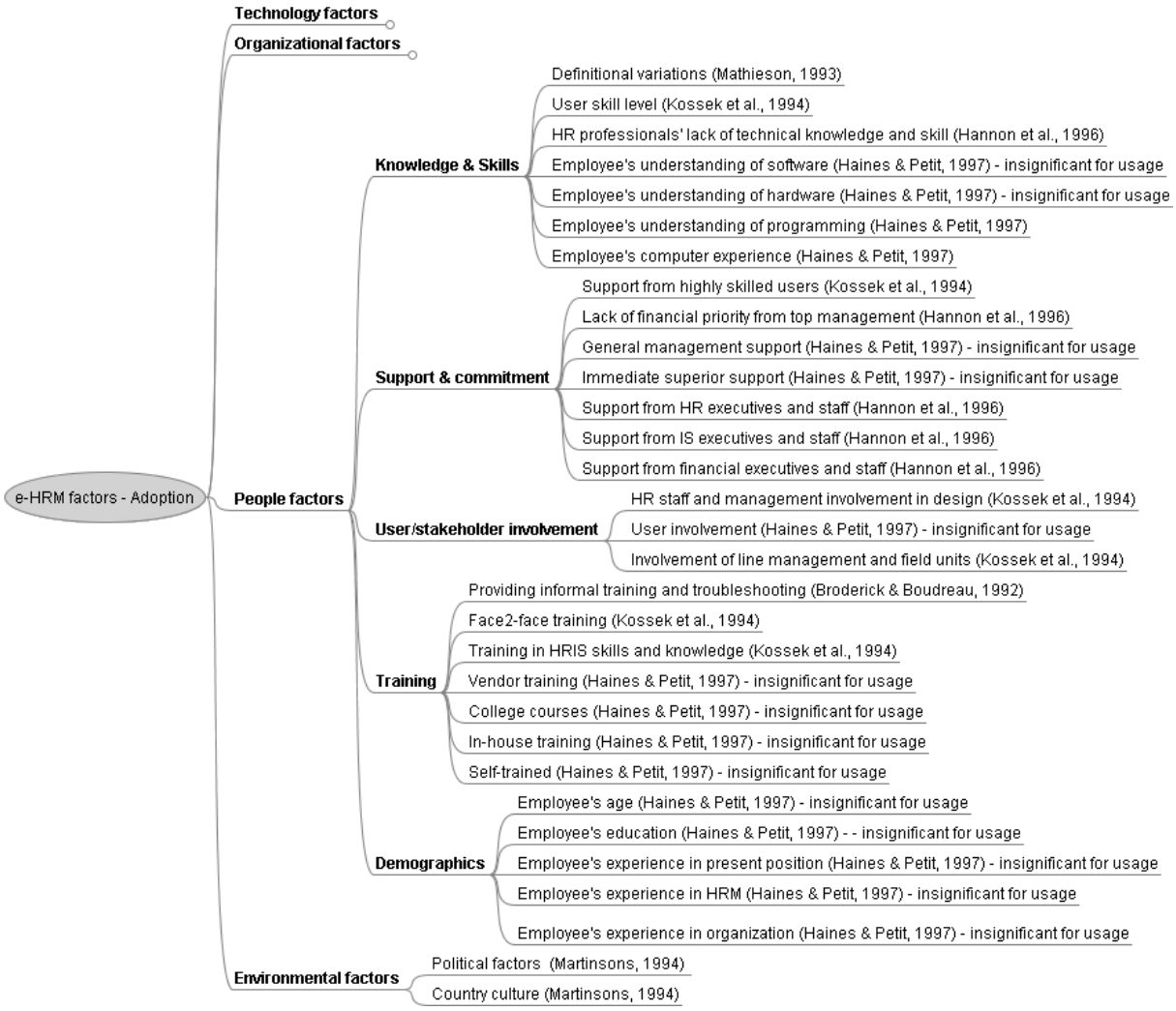
Mind map 2. Factors affecting consequences 1970 – 1989



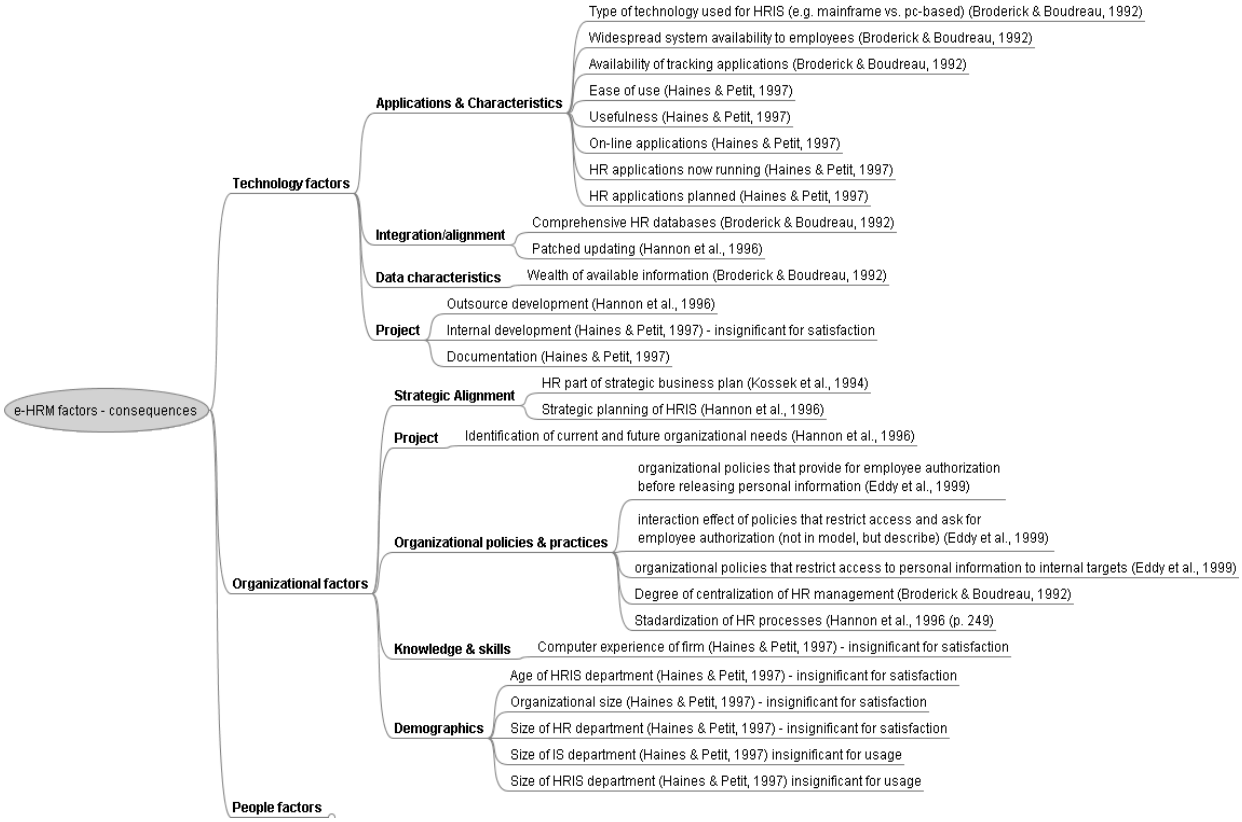
Mind map 3. Consequences 1970 - 1989



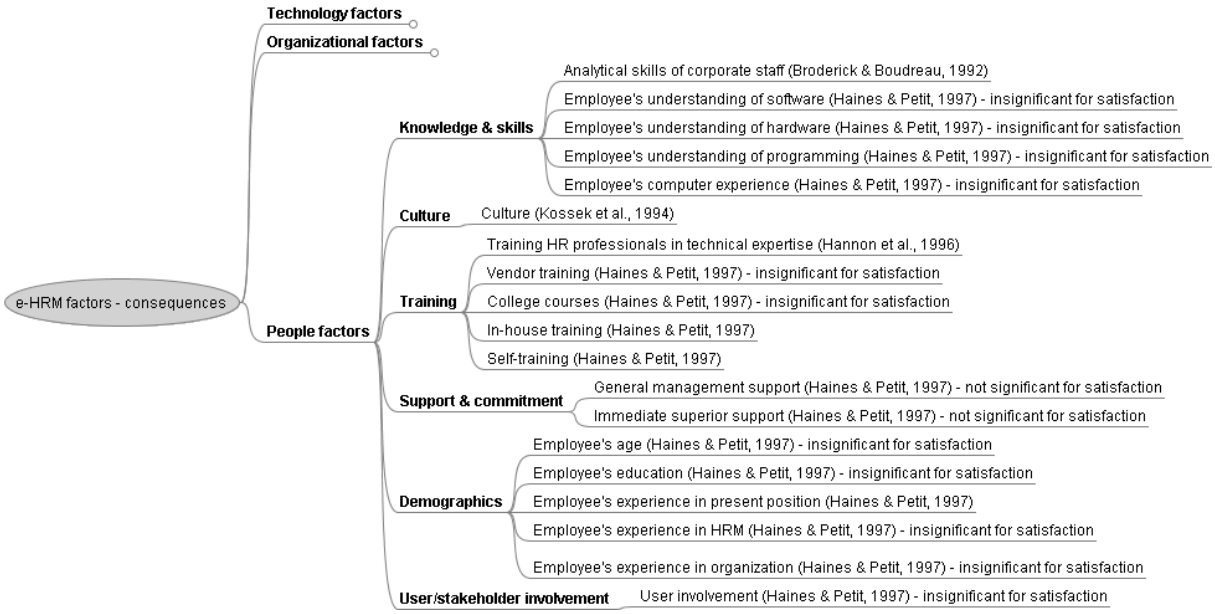
Mind map 4. Factors affecting adoption 1990 - 1999 Part 1



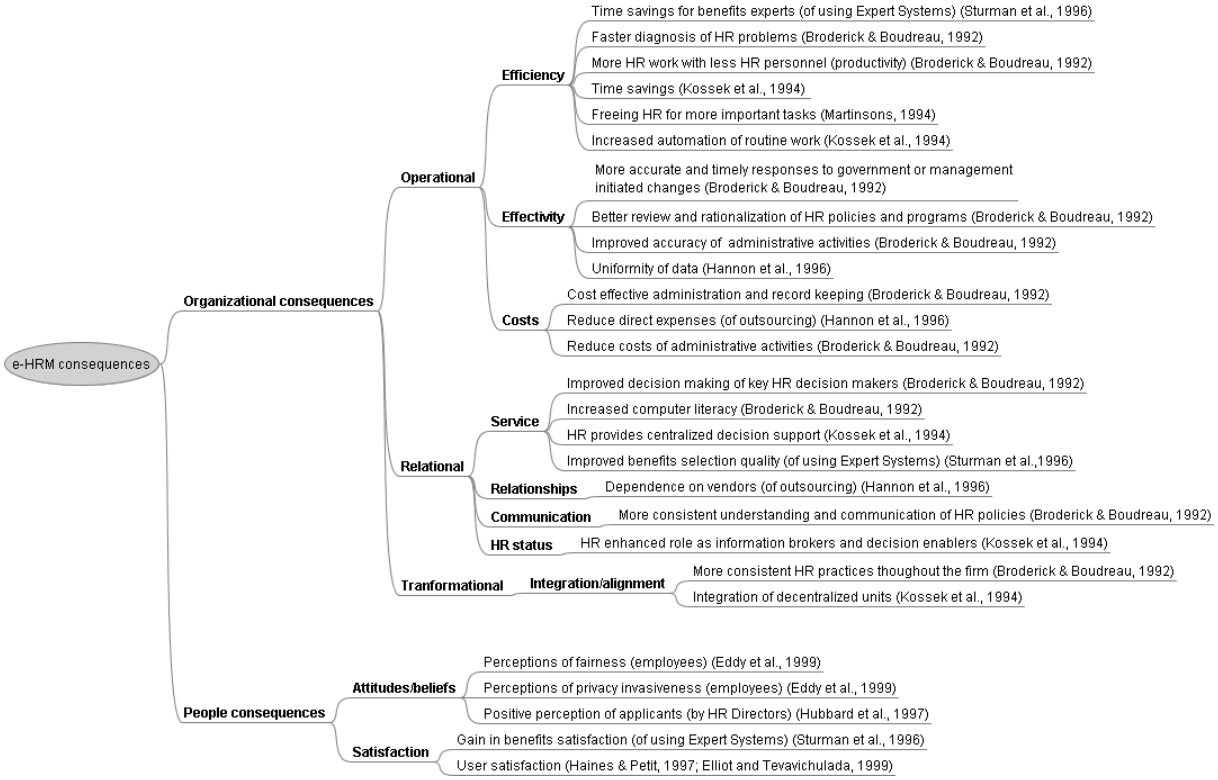
Mind map 5. Factors affecting adoption 1990 – 1999 Part 2



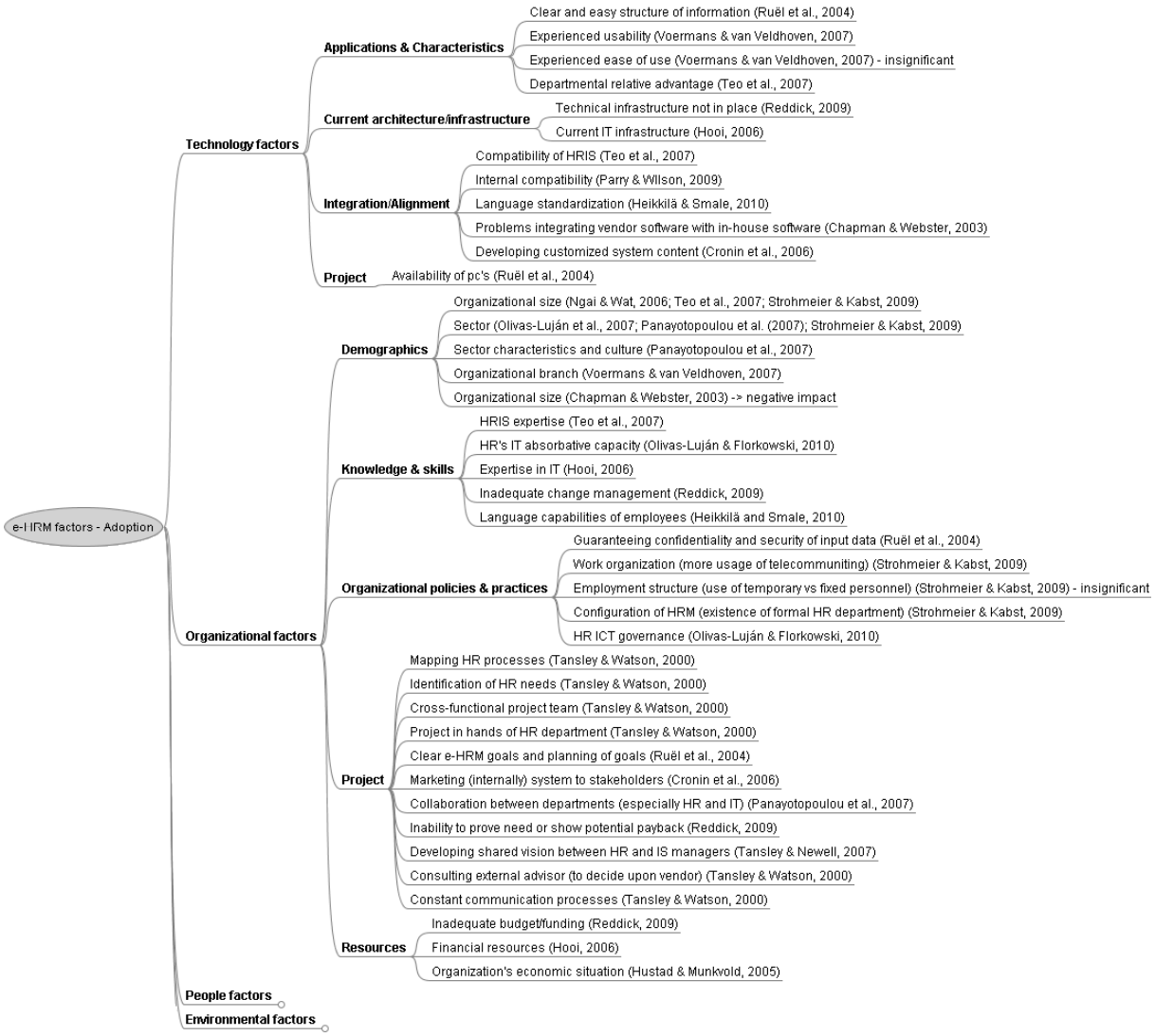
Mind map 6. Factors affecting consequences 1990 – 1999 Part 1



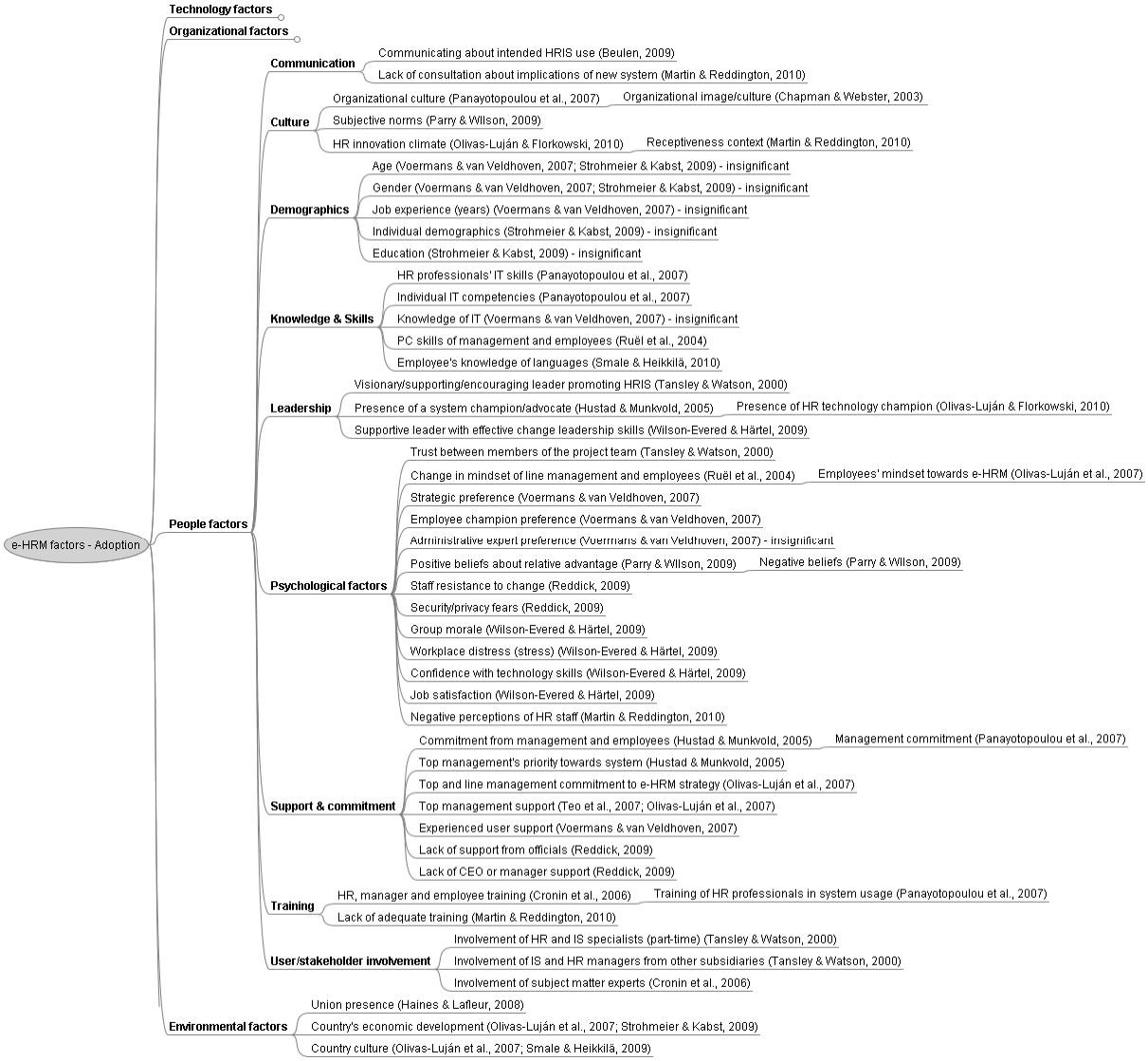
Mind map 7. Factors affecting consequences 1990 – 1999 Part 2



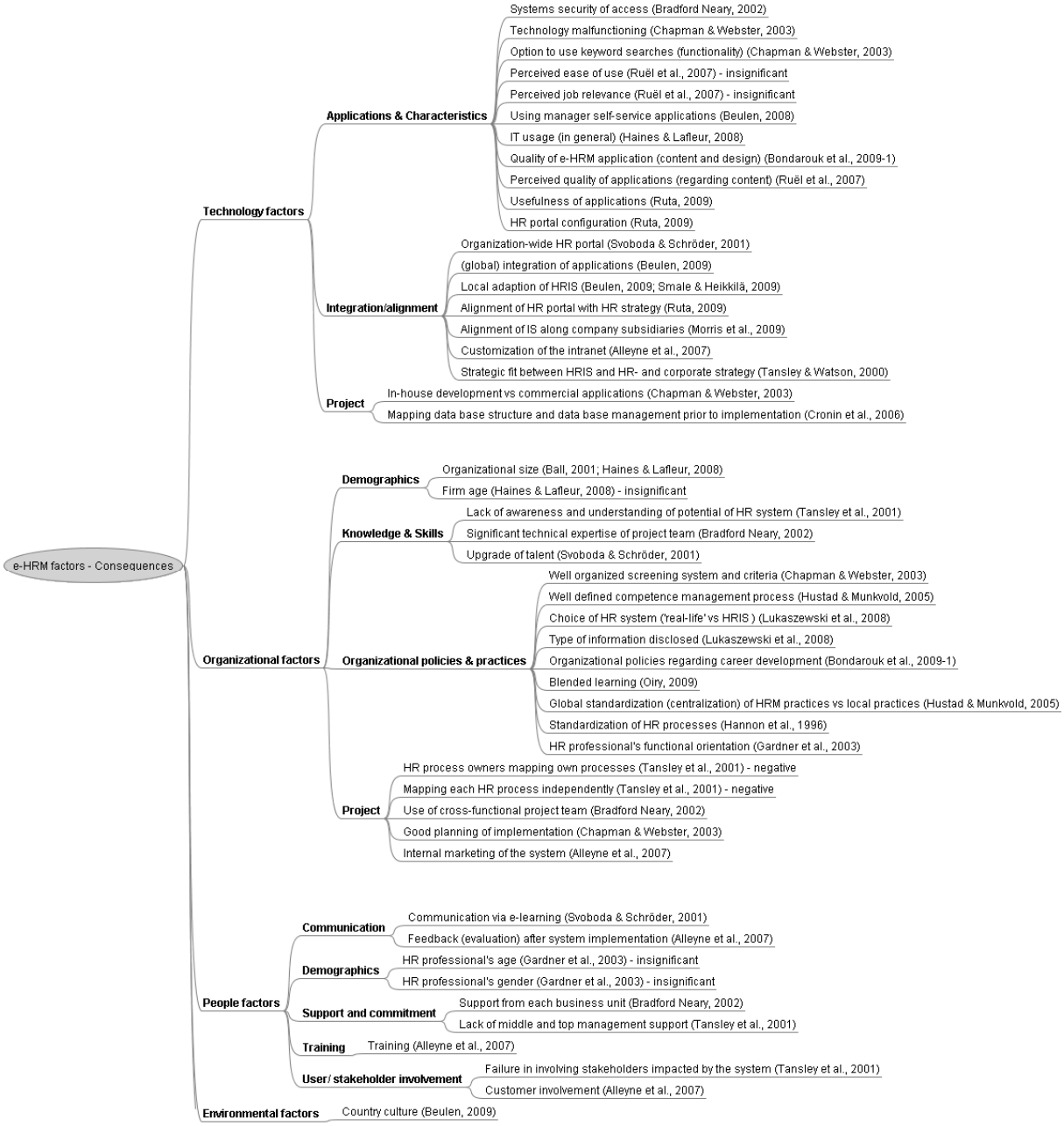
Mind map 8. Consequences 1990 – 1999



Mind map 9. Factors affecting adoption 2000 – 2010 Part 1

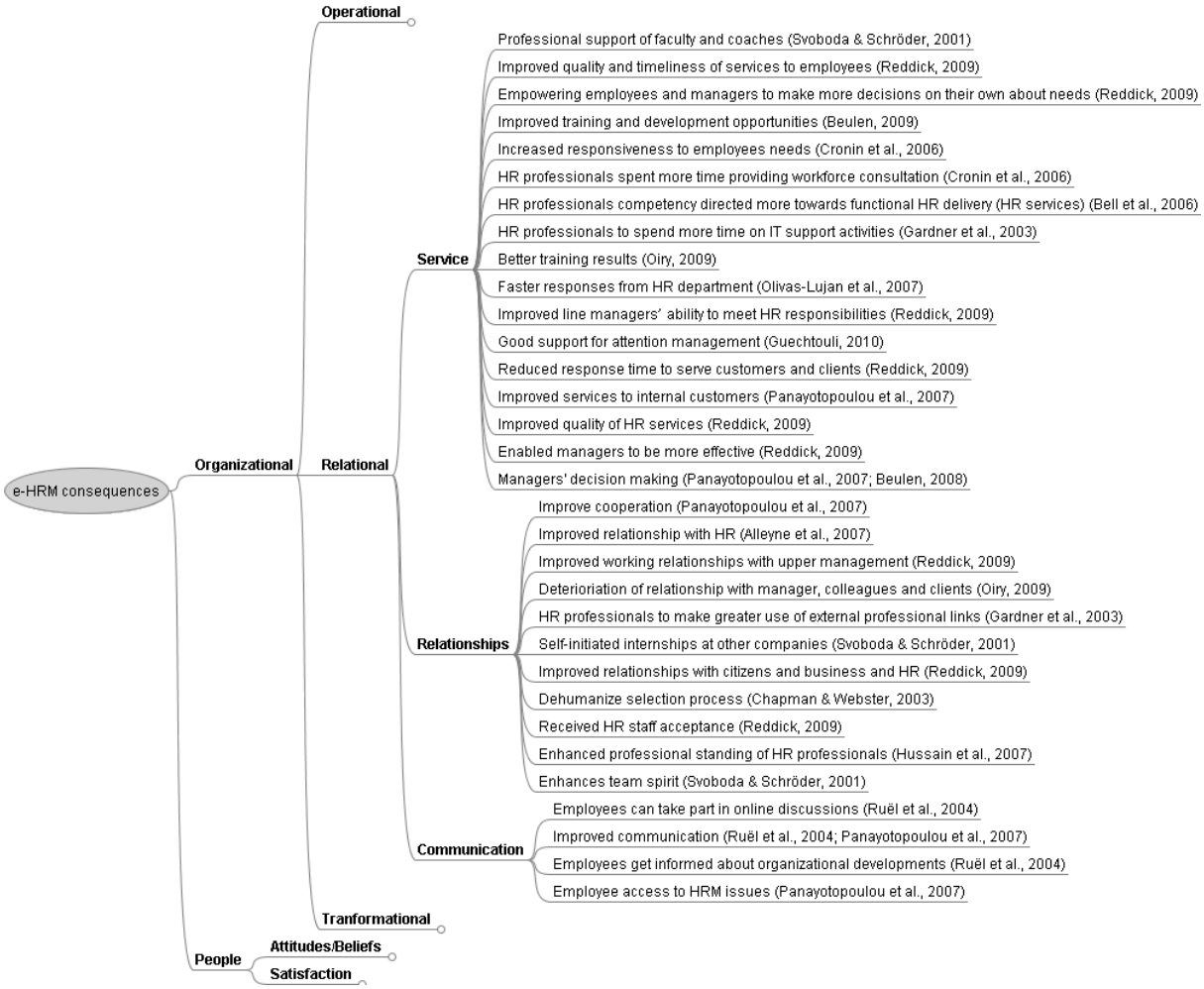


Mind map 10. Factors affecting adoption 2000 – 2010 Part 2

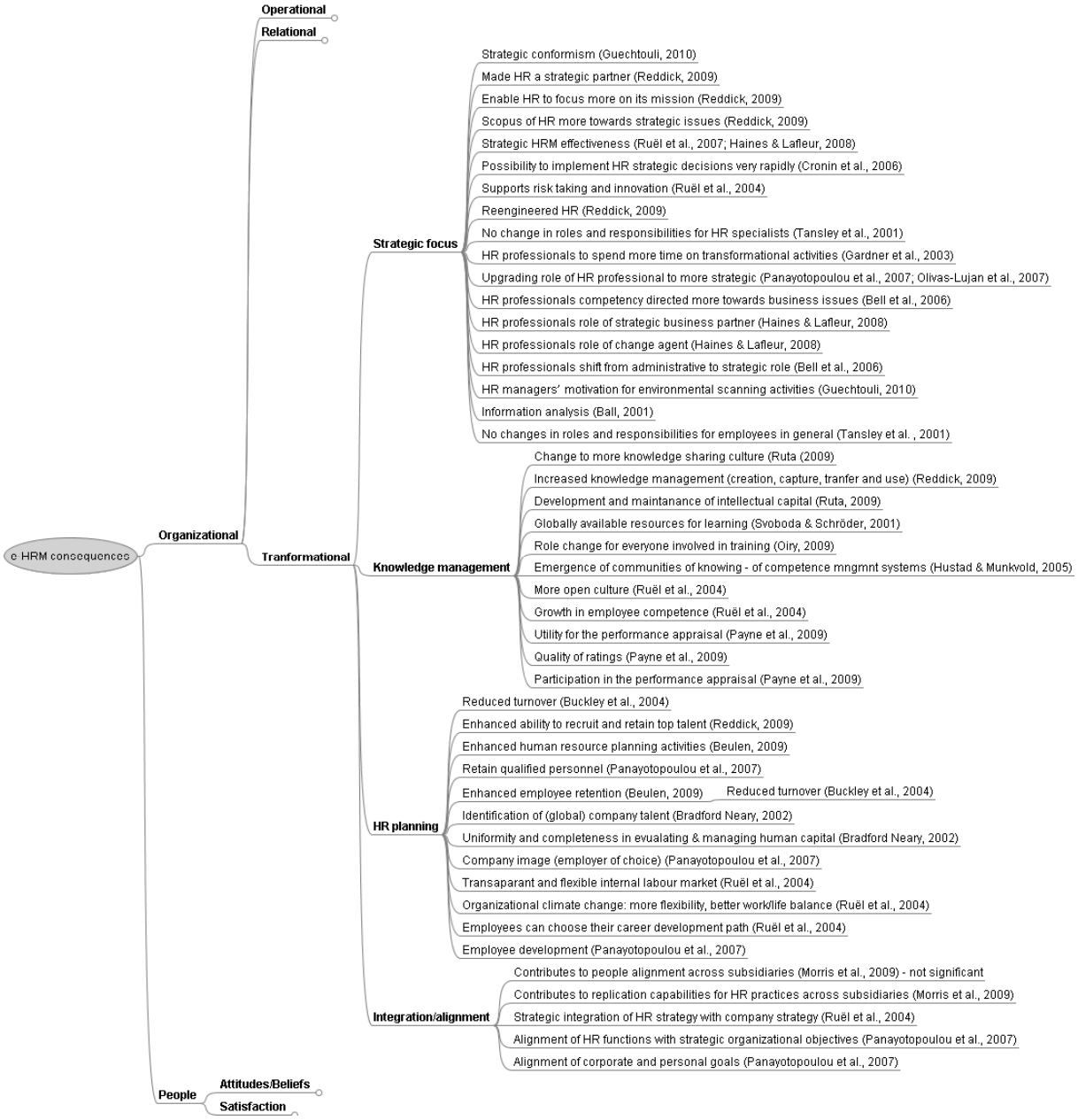


Mind map 10. Factors affecting consequences 2000 – 2010

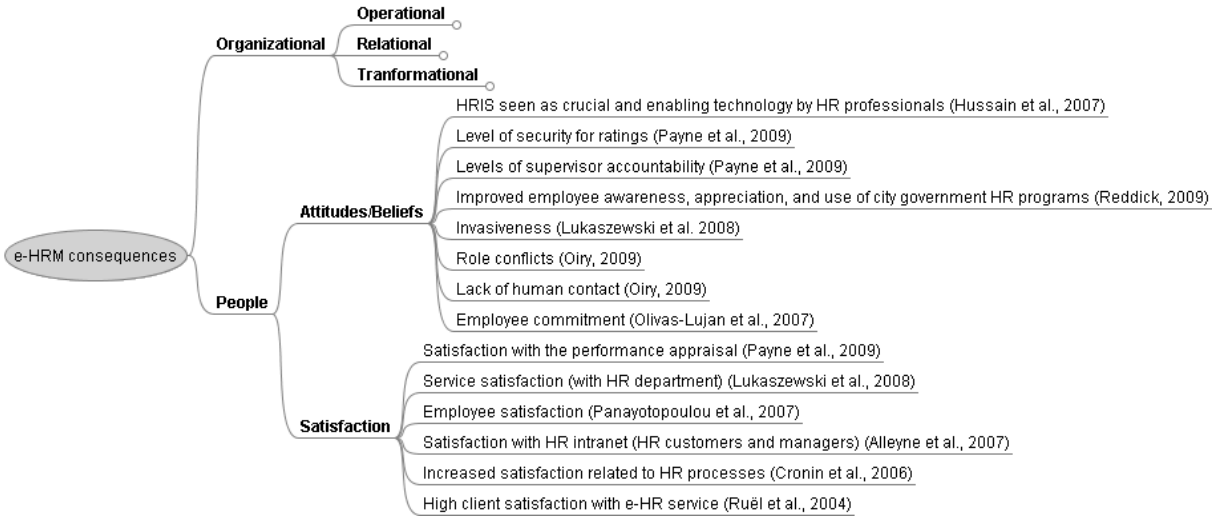
Mind map 11. Consequences 2000 – 2010 Part 1



Mind map 11. Consequences 2000 – 2010 Part 2



Mind map 12. Consequences 2000 – 2010 Part 3



Mind map 13. Consequences 2000 – 2010 Part 4

Appendix E. Interview protocol

A. Introductie

1) Wie ben ik?

2) Wat voor onderzoek heb ik verricht?

3) Waarom ben ik hier voor het interview? → opinie van experts uit de praktijk

4) Definities (zie Appendix)

B. Open interview

1) Hoe definieert u het succes van een e-HRM implementatie?

2) Welke positieve dan wel negatieve consequenties van e-HRM implementaties heeft u in de praktijk waargenomen?

- Welke operationele consequenties van een e-HRM implementatie heeft u in de praktijk waargenomen?
- Welke relationele consequenties van een e-HRM implementatie heeft u in de praktijk waargenomen?
- Welke transformationele consequenties van een e-HRM implementatie heeft u in de praktijk waargenomen?

3) Welke factoren waren bepalend voor het succes of niet-succes van de e-HRM implementatie(s)?

C. Model

Tot slot wil ik u mijn model laten zien en u vragen om deze te beoordelen op basis van de volgende punten (voor zover u deze heeft kunnen overzien):

1. Welke factoren herkent u uit de praktijk die bijdragen aan adoptie (acceptatie en gebruik) of niet-adoptie van e-HRM? Met een + kunt aangeven dat u het met de factor uit de praktijk eens bent, met een – kunt u aangeven dat u het niet eens met de factor. Met 0 kunt u aangeven dat u de factor niet herkent uit de praktijk.

   LET OP! De factoren zijn omschreven zoals ze in de literatuur gevonden zijn. Dit betekent dat sommige factoren negatief, en sommige positief geformuleerd zijn. De positief geformuleerde factoren dragen (volgens de literatuur) op positieve wijze bij aan adoptie en de negatief geformuleerde factoren dragen op negatieve wijze bij. Sommige factoren zijn echter neutraal geformuleerd, maar staat achter de factor of ze significant (van waarde voor adoptie) of niet significant (niet van waarde voor adoptie) zijn.

D. Vervolgstappen

Vertellen over vervolgstappen: artikel, tool, these etc.

Appendix

Definities

Implementatie
Adoptie (acceptatie en gebruik) van een systeem tijdens de transitieperiode tussen de technische installatie van een nieuw systeem en zijn behendig/bekwaam en taak-consistent gebruik door de beoogde medewerkers.

'the adoption of a system during the transition period between the technical installation of a new system and its skilful and task-consistent use by a group of the targeted employees' (Bondarouk, 2004. p. 41)

Factoren
Factoren in ons model kunnen betrekking hebben op 2 zaken: adoptie en consequenties.

Consequenties
Consequenties van het gebruik van een e-HRM systeem.
Traditioneel wordt er onderscheid gemaakt tussen operationele (effectiviteit, efficiëntie, kostenbesparing), relationele (service naar interne en externe cliënten (faciliteren), relaties met interne en externe cliënten) en transformationele consequenties (strategische oriëntatie van de HR afdeling).

Succes
is gedefinieerd als beoogde en verwachte consequenties (congruentie tussen doel en behalen van doel) en niet-verwachte positieve consequenties.

Extra appendix A. **Article HR Praktijk**

Inzicht in oorzaken van adoptie en succes van e-HRM: praktische handvatten voor implementaties

Auteurs:
Tekst: Ferry de Wit | Rik van Wijk | Janneke de Graaff

Het gebruik van e-HRM als HR-informatiesysteem is in de afgelopen jaren steeds meer gegroeid dankzij de opkomst van internettechnologieën en de positieve verwachtingen van organisaties over de resultaten van e-HRM. Enkele voordelen die vaak worden genoemd zijn kostenbesparingen, verbeterde HR-dienstverlening en de heroriëntatie van personeelsmanagement naar een meer strategische rol. Uit wetenschappelijk onderzoek blijkt echter dat veel organisaties moeite hebben om deze geclaimde voordelen te behalen, maar ook om deze te benoemen. Om het nog gecompliceerder te maken, spreken sommige wetenschappelijke publicaties elkaar tegen over de succesfactoren van e-HRM. In de praktijk blijkt dat organisaties zich weinig bewust zijn over de succesfactoren van e-HRM.

In dit artikel vatten we 40 jaar onderzoek naar de succesfactoren van e-HRM samen. We gaan in op wat verstaan wordt onder succesvolle adoptie van e-HRM-systemen en zetten uiteen welke factoren bijdragen aan het succes van e-HRM. Op basis van een grootschalige literatuuronderzoek en praktijkervaringen lichten we enkele bijzondere resultaten uit, tezamen met maatregelen die u bij de implementatie van e-HRM kunt treffen teneinde de beoogde resultaten te behalen.

Het onderzoek en de aanpak
Het succes van e-HRM middels een definitie vastleggen is een exercitie die menigeen heeft uitgevoerd, maar tot op heden geen sluitend en kwantificeerbaar begrip heeft opgeleverd. Uit praktijkonderzoek is gebleken dat het *'behalen van de vooraf vastgestelde doelstellingen'* het vaakst wordt genoemd. Maar hoe behaalt u deze doelstellingen en waar dient u rekening mee te houden?

Literatuur van de afgelopen vier decennia is geanalyseerd om antwoord te krijgen op de vraag: wat zijn de belangrijkste factoren die zowel bijdragen aan succesvolle adoptie als aan het succesvol behalen van doelstellingen van een e-HRM-systeem? Een model is ontwikkeld waarin de factoren (oorzaken) zijn gerelateerd aan adoptie en de consequenties (gevolgen, doelen) van e-HRM. De factoren die leiden tot succesvolle adoptie van e-HRM zijn vervolgens geverifieerd in de praktijk door middel van reviews met experts (P&O'ers uit organisaties waar e-HRM gebruikt wordt, leveranciers van e-HRM-toepassingen en adviseurs). De factoren die leiden tot succes van e-HRM zijn in de praktijk pas verifieerbaar nadat een project enige tijd geleden succesvol is afgerond en langere tijd in gebruik is.

We behandelen de succesfactoren voor zowel de adoptie van e-HRM als succesfactoren voor het behalen van gestelde doelen afzonderlijk . Het onderzoek heeft dermate veel relaties gevonden dat deze niet uitputtend kunnen worden weergegeven in een artikel. Om die reden worden slechts enkele spraakmakende relaties tussen succesfactoren en gevolgen in dit artikel besproken. Het complete model van factoren en relaties, samen met een uitleg over hoe dit praktisch kan worden toegepast, komt online beschikbaar.

De succesfactoren voor e-HRM adoptie
Adoptie van e-HRM is hier gedefinieerd als “het proces van initiëren en implementeren van IT ten behoeve van het ondersteunen van diverse medewerkers in het uitvoeren van HR-taken” (Strohmeier & Kabst, 2009. p. 484). Kortom, het draait hier om welke factoren bijdragen aan het succesvol initiëren en implementeren van e-HRM. Deze factoren zijn in te delen in de categorieën:

- technologische factoren
- organisatorische factoren
- menselijke factoren

Een opmerkelijke organisatorische factor die we hebben gevonden is “configuratie van HR”. Hiermee wordt de mate van aanwezigheid van een formele Afdeling P&O bedoeld. Deze wordt tevens door alle respondenten, op één expert na, als succesfactor bevestigd. Het blijkt dus dat wanneer een organisatie beschikt over een formele Afdeling P&O met formele processen en eenduidig beleid, een succesvolle adoptie aannemelijker is.

Ook interessant is het feit dat “P&O-innovatieklimaat” en “P&O’s absorberende capaciteit” ten aanzien van IT invloed hebben op de adoptie van een systeem. Innovatieklimaat wordt beschreven als de mate waarin de Afdeling P&O open staat voor innovatie binnen de afdeling en is tevens onderdeel van organisatiecultuur. Met IT-absorberende capaciteit wordt de capaciteit van medewerkers bedoeld om relevante kennis te ontwikkelen, belangrijke externe sturingsinformatie te herkennen, juiste beslissingen te nemen en effectieve werkprocessen en structuren ten aanzien van IT te implementeren (Cohen & Levinthal, 1990). Als een organisatie een goed innovatieklimaat kent en de IT-absorberende capaciteit van deze afdeling hoog is, is de kans op succesvolle adoptie van e-HRM groter. Dit geldt echter alleen wanneer de uiteindelijke verantwoordelijkheid over het HR-systeem tevens bij de IT-afdeling ligt (Olivas-Luján & Florkowski, 2010).

Zowel de literatuur als de praktijk tonen aan dat het implementatieproces geleid zou moeten worden door een verantwoordelijke vanuit de Afdeling P&O (Tansley & Watson, 2000). Dit gezien het feit dat zij het best de behoeften en eisen vanuit P&O in kaart kunnen brengen en gedurende het proces kunnen bewaken.

Zowel de literatuur als de praktijk laten zien dat organisaties met een cultuur die gedomineerd wordt door technologievriendelijke normen, dus waarbij de medewerkers positieve attitudes hebben ten aanzien van technologie, eerder succesvolle adoptie bereiken dan organisaties die deze normen niet bezitten.

Tot slot is gebleken dat deze normen per sector verschillen. Zo tonen afzonderlijke studies dat de bankensector eerder een succesvolle adoptie bereikt dan andere sectoren (Olivas-Luján et al., 2007; Strohmeier & Kabst, 2009). Het is daarom belangrijk om voor een implementatie te bepalen welke cultuur dominant is in een organisatie en vervolgens de juiste maatregelen te treffen. Dit kan bijvoorbeeld door middel van verandermanagement waarmee de attitudes van de medewerkers ten aanzien van e-HRM positief beïnvloed kunnen worden om zo een positief P&O-innovatieklimaat te creëren. Ten aanzien van IT-absorberende capaciteit doen organisaties er goed aan om personeel te scholen in het gebruik van e-HRM en hen bewust te maken van de implicaties en het potentieel van deze technologie.

Tabel 1: Succesfactoren voor adoptie van e-HRM

Factor	Omschrijving	Relatie	Maatregelen
Configuratie van P&O afdeling +	Aanwezigheid van een formele P&O afdeling.	De aanwezigheid van een formele P&O afdeling wordt positief geassocieerd met adoptie van e-HRM.	1. Formaliseren P&O afdeling. 2. Formele processen en eenduidig beleid implementeren .
HR-innovatieklimaat +	De mate waarin de HR-afdeling open staat voor innovatie binnen de afdeling. Onderdeel van organisatiecultuur.	Een innovatieklimaat of organisatiecultuur welke positieve attitudes bevat jegens e-HRM wordt positief geassocieerd met adoptie van e-HRM, mits de verantwoordelijkheid over het systeem bij de IT afdeling ligt.	3. Bepaal welke cultuur dominant is. 4. Wanneer het innovatieklimaat niet positief is ten aanzien van e-HRM kunnen maatregelen worden getroffen teneinde het klimaat positief te beïnvloeden, bijvoorbeeld door middel van verandermanagement.
HR's IT-absorberende capaciteit +	De capaciteit van medewerkers om relevante kennis te ontwikkelen, belangrijke externe sturingsinformatie te herkennen, juiste beslissingen te nemen en effectieve werkprocessen en structuren ten aanzien van IT te implementeren.	Een hogere mate van IT-absorberende capaciteit wordt positief geassocieerd met adoptie van e-HRM, mits de verantwoordelijkheid over het systeem bij de IT afdeling ligt.	5. Absorberende capaciteit kan bevorderd worden door middel van trainingen om kennis en kunde te bevorderen en duidelijke interne communicatie over de implicaties en het potentieel van het systeem.
e-HRM project in handen van P&O +	Het project dient geleid te worden door een verantwoordelijke van de P&O-afdeling. Veelal zal dit een P&O manager betreffen gezien de brede kennis over de afdeling.	Wanneer het e-HRM project geleid worden door een verantwoordelijke van de P&O afdeling wordt dit positief geassocieerd met adoptie van e-HRM.	6. Wijs een verantwoordelijke aan vanuit de P&O afdeling. Bij voorkeur de persoon met de meeste kennis en vaardigheden op het gebied van P&O die eveneens de capaciteit bezig om mensen achter zich te scharen (veelal manager).

Factoren die bijdragen aan het behalen van beoogde doelstellingen

Ook bij factoren die bijdragen aan het behalen van de beoogde doelstellingen onderscheiden we technologische, organisatorische en menselijke soorten. Op technologisch gebied werd gevonden dat de "kwaliteit van de inhoud van een e-HRM systeem" positief samenhangt met strategische HRM effectiviteit (Bondarouk et al., 2009). Wanneer organisaties dus de strategische bijdrage van HRM willen vergroten, blijkt het van groot belang om de inhoud van het systeem goed af te stemmen op de behoeften van de gebruikers.

Een bijzondere factor met betrekking tot organisatiebeleid is in hoeverre medewerkers de "keuze hebben uit een HRM-systeem": bijvoorbeeld e-HRM of face-2-face. Wanneer medewerkers de keus krijgen uit beide systemen, voelen zij zich minder geschonden in hun privacy en zijn zij meer tevreden met P&O-dienstverlening (Lukaszewski et al., 2008). In een case studie van een groot bedrijf in Engeland is gevonden dat deze organisatie niet in staat was om de Afdeling P&O strategisch te heroriënteren. Als belangrijke factoren voor het falen in deze en andere studies worden vaak genoemd:

- *het gebrek aan bewustzijn en kennis van de potentie van het systeem*
- *het betrekken van stakeholders*
- *het gebrek aan ondersteuning vanuit midden- en topmanagement*

De eerste factor kan het gevolg zijn van een tekort aan kennis en ervaring, maar ook van weerstand om naar trainingen te gaan uit angst voor technologie. Ook hier lijkt adequaat verandermanagement een uitkomst te bieden.

Tabel 2: Succesfactoren voor te behalen doelstellingen met e-HRM

Factor	Omschrijving	Relatie	Maatregelen
Kwaliteit van e-HRM inhoud +	In hoeverre de inhoud van het e-HRM systeem overeenkomt met de behoeften van de gebruikers.	Een hogere kwaliteit van e-HRM wordt geassocieerd met het bereiken van strategische HRM doelen.	1. Voorafgaand aan de implementatie in kaart brengen wat de behoeften en eisen van de gebruikers zijn. 2. Vervolgens het systeem zo goed mogelijk afstemmen op behoeftes en eisen.
Keuze HR systeem +	De mate waarin medewerkers de keus hebben om gebruik te maken van e-HRM of face-2-face met een HR professional te kunnen interacteren.	Wanneer medewerkers de keus hebben uit verschillende HR systemen zullen zij zich minder geschonden voelen in hun privacy en de kwaliteit van HR dienstverlening als hoger beoordelen.	3. Geef medewerkers de keus uit HR systemen. Dit is met name gewenst bij HR kwesties die intensieve interactie vergen of kwesties waarbij de privacy van een medewerker in het geding komt (bijvoorbeeld medische kwesties).
Bewustzijn en kennis van de potentie van e-HRM +	De mate waarin medewerkers zich bewust zijn en kennis hebben van de potentie van e-HRM.	Het is gebleken dat wanneer medewerkers weinig kennis hebben en zich niet bewust zijn van de potentie van e-HRM strategische HR doelen moeilijk te behalen zijn.	4. School de medewerkers ten aanzien van het potentieel van het systeem om ze op deze wijze bewust te maken van de implicaties en mogelijkheden.
Betrokkenheid stakeholders +	De mate waarin relevante stakeholders betrokken zijn bij het implementatieproces.	Het is gebleken dat wanneer relevante stakeholders niet worden betrokken bij het implementatieproces strategische HR doelen moeilijk te behalen zijn.	5. Betrek relevante stakeholders bij het implementatieproces. 6. Laat ze deelnemen aan brainstormsessies en breng hun behoeften en eisen in kaart. 7. Stem vervolgens het systeem zo veel mogelijk af op deze behoeften en eisen.
Ondersteuning top management +	De mate waarin een e-HRM project ondersteuning geniet vanuit het top management. Dit kan in de vorm van financiële resources, inzet personeel en emotionele ondersteuning.	Het is gebleken dat wanneer een e-HRM project weinig ondersteuning geniet vanuit het top management strategische HR doelen moeilijk te behalen zijn.	8. Er dient minimaal één HR-promotor binnen de organisatie aangewezen te worden die ‘op de bres’ gaat (evt. gaan) voor e-HRM. 9. Deze promotor dient door middel van een gedegen business case het top management te overtuigen van de behoefte en het nut van e-HRM.

Lessons learned

Als we kijken naar de selectie van factoren die hierboven zijn beschreven valt het belang van het menselijk aspect op. Wanneer alle literatuur vanaf de jaren ’70 in deze conclusie wordt meegenomen valt op te maken dat wetenschappers zich door de jaren heen steeds meer bewust zijn geworden van de menselijke succesfactor. Waar de eerste onderzoekers zich voornamelijk richtten op technologie, lijkt dat tegenwoordig vrijwel geen obstakel meer te zijn voor het behalen van succes met e-HRM.

Voor zowel het succes van een adoptie als voor het behalen van doelstellingen spelen de wijze waarop wordt ingespeeld op cultuur en attitudes een cruciale rol. Ondersteuning vanuit management, het

betrekken van stakeholders en adequaat verandermanagement maken het verschil bij e-HRM, systemen die alle mensen binnen een organisatie raken.

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Het volledige onderzoek naar alle succesfactoren en relaties voor e-HRM zal binnenkort in een uitgebreid artikel online verschijnen. Op basis hiervan is een model ontwikkeld dat organisaties helpt om te bepalen in hoeverre e-HRM succesvol kan worden geïmplementeerd in hun organisatie en op welke onderdelen zij maatregelen moeten treffen.

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Extra appendix B. **Article TIEM**

Inzicht in oorzaken van adoptie en succes van e-HRM: praktische handvatten voor implementaties

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Het gebruik van e-HRM als HR-informatiesysteem is in de afgelopen jaren steeds meer gegroeid dankzij de opkomst van internettechnologieën en de positieve verwachtingen van organisaties over de resultaten van e-HRM. Enkele voordelen die vaak worden genoemd zijn kostenbesparingen, verbeterde HR-dienstverlening en de heroriëntatie van personeelsmanagement naar een meer strategische rol. Uit wetenschappelijk onderzoek blijkt echter dat veel organisaties moeite hebben om deze geclaimde voordelen te behalen, maar ook om deze te benoemen. Om het nog gecompliceerder te maken, spreken sommige wetenschappelijke publicaties elkaar tegen over de succesfactoren van e-HRM. In de praktijk blijkt dat organisaties zich weinig bewust zijn over de succesfactoren van e-HRM.

In dit artikel vatten gaan we in op wat verstaan wordt onder succesvolle adoptie van e-HRM-systemen en zetten uiteen welke factoren bijdragen aan het succes van e-HRM. Op basis van een grootschalige literatuuronderzoek en praktijkervaringen lichten we enkele bijzondere resultaten uit, tezamen met maatregelen die u bij de implementatie van e-HRM kunt treffen teneinde de beoogde resultaten te behalen.

Het onderzoek en de aanpak
We hebben literatuur van de afgelopen vier decennia geanalyseerd om antwoord te krijgen op de vraag: wat zijn de belangrijkste factoren die bijdragen aan succesvol e-HRM? Op basis hiervan hebben we een model ontwikkeld waarin de factoren (oorzaken) zijn gerelateerd aan adoptie en de consequenties (gevolgen, doelen) van e-HRM. De factoren die leiden tot succesvolle adoptie van e-HRM zijn vervolgens geverifieerd in de praktijk door middel van reviews met experts (P&O'ers uit organisaties waar e-HRM gebruikt wordt, leveranciers van e-HRM-toepassingen en adviseurs). De factoren die leiden tot succes van e-HRM zijn in de praktijk te verifiëren nadat een project enige tijd geleden succesvol is afgerond en langere tijd in gebruik is.

We behandelen de succesfactoren voor zowel de adoptie van e-HRM als succesfactoren voor het behalen van gestelde doelen afzonderlijk. Het onderzoek heeft dermate veel relaties gevonden dat deze niet uitputtend kunnen worden weergegeven in een artikel. Om die reden worden slechts enkele spraakmakende relaties tussen succesfactoren en gevolgen in dit artikel besproken. Eerst zal worden ingegaan op de doelen die met e-HRM te behalen zijn en zal getracht worden om een antwoord te geven op wat e-HRM onderscheidt van andere informatiesystemen en waarom het dus als losstaand systeem onderzocht moet worden. Het complete model van factoren en relaties, samen met een uitleg over hoe dit praktisch kan worden toegepast, komt online beschikbaar.

Welke doelen kunnen met e-HRM worden behaald?
Het succes van e-HRM middels een definitie vastleggen is een exercitie die menigeen heeft uitgevoerd, maar tot op heden geen sluitend en kwantificeerbaar begrip heeft opgeleverd. De literatuur

toont aan dat er op twee manieren over succes kan worden gesproken in relatie tot e-HRM, namelijk als succesvolle adoptie en het succesvol behalen van vooraf gestelde doelen. Wanneer de tweede doelstelling is behaald kan in onze ogen pas gesproken worden van succesvol e-HRM. Dit strookt tevens met verwachtingen uit de praktijk, gezien uit ons onderzoek is gebleken dat *'behalen van de vooraf vastgestelde doelstellingen'* het vaakst wordt genoemd. Maar welke doelstellingen kunnen organisaties met e-HRM nastreven en in hoeverre zijn deze doelen reëel haalbaar?

Zoals gezegd heeft e-HRM traditioneel gezien drie voordelen: kostenbesparing, verbetering van HR-dienstverlening en een strategische heroriëntatie van de HR afdeling (Ruël et al., 2004), in de literatuur ook wel operationele, relationele en transformationele consequenties genoemd (Lepak & Snell, 1998) (Tabel 1).

Empirisch onderzoek toont aan dat deze doelen in praktijk ook daadwerkelijk worden behaald en zich op verschillende wijzen manifesteren. Aangaande operationele doelen vonden we dat e-HRM geleid heeft tot verbeterde effectiviteit van P&O-taken (Panayotopoulou et al., 2007; Beulen, 2008), verhoogde efficiëntie van administratieve taken (Reddick, 2009) en kostenbesparing (Buckley et al., 2004). Op relationeel vlak vonden we een verbeterde dienstverlening vanuit de P&O-afdeling in de zin dat er meer tijd gespendeerd werd aan het consulteren van werknemers (Cronin et al., 2006) en de kwaliteit en tijdigheid van dienstverlening verbeterde (Reddick, 2009). Verder vonden we dat niet alleen relaties met de HR-medewerkers (Alleyne et al., 2007), maar tevens relaties van werknemers met het management positief werden beïnvloed door e-HRM (Reddick, 2009). Wat transformationele consequenties betreft zagen we dat P&O-professionals na een e-HRM implementatie meer tijd spendeerden aan activiteiten die bijdroegen aan strategische organisatiedoelen (Gardner et al., 2003) en er zodoende een strategische heroriëntatie van de HR afdeling plaatsvond (Panayotopoulou et al., 2007).

Kortom, gezien deze resultaten zijn de traditioneel beloofde doelen zeker haalbaar. Het praktijkonderzoek vertelt echter wel dat hoe hoger het ambitieniveau van een organisatie is, hoe langer het duurt voordat de beoogde doelen zichtbaar worden. Kortom, een efficiëntieslag is eerder te verwachten dan de strategische heroriëntatie van de volledige P&O-afdeling. Daarnaast is een saillant punt dat succesvolle adoptie niet automatisch zal leiden tot positieve resultaten maar dat een grote verscheidenheid aan factoren in ogenschouw moeten worden genomen alvorens deze resultaten daadwerkelijk behaald kunnen worden.

Tabel 1: Met e-HRM beoogde en behaalde doelen

Doel	Omschrijving	Behaald in de vorm van:
Operationele doelen +	Doelen van de organisatie die erop gericht zijn om de operationele effectiviteit te verbeteren. Deze zijn met name gericht op het verlichten van de administratieve last van de P&O-afdeling en kunnen tot uiting komen in een verhoogde efficiëntie, verhoogde effectiviteit en verlaging van de operationele kosten.	- Verbeterde effectiviteit van P&O-taken - Verbeterde efficiëntie van administratieve taken - Kostenbesparingen
Relationele doelen +	Doelen van de organisatie die erop gericht zijn om relaties binnen de organisatie te verbeteren en deze relaties beter in te zetten. Daarnaast kan het er ook op gericht zijn om de verstandhouding tussen P&O en externe relaties te verbeteren.	- P&O-professionals die meer tijd spenderen aan het consulteren van medewerkers - Betere kwaliteit en tijdigheid van HR dienstverlening
Transformationele doelen +	Doelen van de organisatie die erop gericht zijn om de doelstellingen en taken van de P&O-afdeling aan te laten sluiten op – en onderdeel te maken van - de organisatiestrategie. Er wordt ook gesproken over een strategische heroriëntatie van de afdeling P&O.	- HR professionals die meer tijd spenderen aan activiteiten die bijdragen aan strategische organisatiedoelen - Strategische heroriëntatie van de P&O-afdeling

Wat onderscheidt e-HRM van andere informatiesystemen?
Alvorens wordt ingegaan op de succesfactoren van e-HRM is het belangrijk om de uniciteit van e-HRM ten opzichte van andere informatiesystemen duidelijk te krijgen. Dit heeft namelijk significante implicaties voor de omvang van de gevonden factoren en beantwoord tevens de vraag waarom e-HRM-onderzoek apart wordt uitgevoerd van ander IS onderzoek.
Ten eerste is een belangrijk onderscheid dat e-HRM de organisatie in haar geheel raakt. In tegenstelling tot bijvoorbeeld een ERP systeem , is e-HRM ondersteunend voor alle werknemers van de organisatie. Kortom, het heeft een groter *bereik*.
Een tweede onderscheidend aspect is de *informatiesoort*. Een e-HRM systeem ondersteunt in het opslaan, bewerken en analyseren van gevoelige personeelsinformatie. Wanneer de organisatie niet op een veilige en vertrouwelijke manier omgaat met deze informatie kunnen medewerkers zich geschonden in hun privacy voelen en vinden dat ze oneerlijk behandeld worden. Dit kan verreikende juridische gevolgen hebben. Tot slot verschilt e-HRM in de *implicatie*s die het heeft. Waarbij andere software voornamelijk wordt ingezet voor een kostenbesparend effect door hogere efficiëntie of effectiviteit te behalen, kunnen organisaties met e-HRM tevens ambitieuzere doelen nastreven: het verbeteren van de P&O-dienstverlening en uiteindelijk de strategische heroriëntatie van de gehele P&O-afdeling. Zoals eerder beschreven wordt het laatste doel ook wel transformationeel genoemd, in die zin dat e-HRM een middel kan zijn om de HR afdeling significant te transformeren om het zodoende bij te laten dragen aan de strategische langetermijndoelstellingen van de organisatie. Dit kan met e-HRM door a. de administratieve last te verminderen en b. informatie op een zodanige wijze bewerken, organiseren en presenteren dat het significant bijdraagt aan strategische besluitvorming met betrekking tot het personeelsbeleid.

De succesfactoren voor e-HRM adoptie
Adoptie van e-HRM is hier gedefinieerd als “het proces van initiëren en implementeren van informatietechnologie ten behoeve van het ondersteunen van diverse medewerkers in het uitvoeren van HR-taken” (Strohmeier & Kabst, 2009. p. 484). Kortom, het draait hier om welke factoren bijdragen aan het succesvol initiëren en implementeren van e-HRM. Deze factoren zijn in te delen in de categorieën:

- technologische factoren
- organisatorische factoren
- menselijke factoren

Een belangrijke organisatorische factor die we hebben gevonden is *interne marketing van het systeem* ofwel in hoeverre het systeem binnen de organisatie gepromoot wordt. Cronin et al. (2006) beschrijven hoe binnen een onderzochte organisatie het personeel werd klaargestoomd voor e-HRM door middel van demonstraties, nieuwsbrieven, handleidingen, trainingen en het aanstellen van zogenaamde technologiepromotors die de rest van het personeel meenemen in de organisatieverandering. Deze factor bleek van cruciaal belang bij de uiteindelijke adoptie van het e-HRM systeem.

Verder is gebleken dat de *organisatiecultuur* voor de implementatie niet over het hoofd gezien mag worden. Zowel de literatuur als de praktijk laten zien dat organisaties met een cultuur die gedomineerd wordt door technologievriendelijke normen, dus waarbij de medewerkers positieve attitudes hebben ten aanzien van technologie, eerder succesvolle adoptie bereiken dan organisaties die deze normen niet bezitten. Het is tevens gebleken dat deze normen per sector verschillen. Zo tonen afzonderlijke studies dat de bankensector eerder een succesvolle adoptie bereikt dan andere sectoren (Olivas-Luján et al., 2007; Strohmeier & Kabst, 2009). Het is daarom belangrijk om voor een implementatie te bepalen welke cultuur dominant is in een organisatie en

vervolgens de juiste maatregelen te treffen. Dit kan bijvoorbeeld door middel van verandermanagementtechnieken waarmee de attitudes van de medewerkers ten aanzien van e-HRM beïnvloed kunnen worden om zo een positief innovatieklimaat te creëren.

Naast organisatiebrede factoren vonden we tevens factoren binnen de afdeling P&O die het verschil kunnen maken tussen een succesvolle en niet succesvolle adoptie. *Configuratie van P&O* (Strohmeier & Kabst, 2009), ofwel de mate van aanwezigheid van een formele Afdeling P&O en in hoeverre deze afdeling strategisch is georiënteerd wordt tevens door alle respondenten, op één expert na, als succesfactor bevestigd. Het blijkt dus dat wanneer een organisatie beschikt over een formele Afdeling P&O met formele processen, eenduidig beleid en strategische focus, een succesvolle adoptie aannemelijker is. Organisatiebreed blijkt een strategische focus ook van belang. Zo vonden Voermans en van Veldhoven (2007) dat organisaties waarbij de medewerkers en managers een voorkeur hadden voor een HR-professional in een strategische rol attitudes richting e-HRM positiever waren, terwijl de voorkeur voor een HR-professional in een dienstverlenende rol juist met negatieve attitudes jegens e-HRM werd geassocieerd. Dit hangt waarschijnlijk samen met het feit dat respondenten die waarde hechten aan dienstverlenend HR, de digitalisering van HR als een bedreiging voor deze dienstverlening zien. Anderzijds opent e-HRM juist deuren voor strategisch HR.

Ook interessant is het feit dat *P&O's absorberende capaciteit* ten aanzien van IT invloed heeft op de adoptie van een systeem. Met IT-absorberende capaciteit wordt de capaciteit van medewerkers bedoeld om relevante kennis te ontwikkelen, belangrijke externe sturingsinformatie te herkennen, juiste beslissingen te nemen en effectieve werkprocessen en structuren ten aanzien van IT te implementeren (Cohen & Levinthal, 1990), kortom in hoeverre de medewerkers in staat zijn uit e-HRM te halen wat erin zit. Als de IT-absorberende capaciteit van deze afdeling hoog is, is de kans op succesvolle adoptie van e-HRM groter. Dit geldt echter alleen wanneer de uiteindelijke verantwoordelijkheid over het HR-systeem tevens gedeeld wordt met de IT-afdeling (Olivas-Luján & Florkowski, 2010). Ten aanzien van IT-absorberende capaciteit doen organisaties er goed aan om getalenteerd personeel aan te trekken, personeel te scholen in het gebruik van e-HRM en hen bewust te maken van de implicaties en het potentieel van deze technologie.

Tot slot zijn zowel de literatuur als de praktijk het erover eens dat het implementatieproces geleid zou moeten worden door een *verantwoordelijke vanuit de Afdeling P&O* (Tansley & Watson, 2000). Dit is echter niet altijd zo geweest. Literatuur uit de jaren '70, '80 en deels '90 laat zien dat dit initieel een aangelegenheid was voor technische afdelingen. Met de jaren is duidelijk geworden dat verantwoordelijken van de afdeling P&O het best de behoeften en eisen vanuit P&O in kaart kunnen brengen en gedurende het proces kunnen bewaken om zodoende een bredere adoptie te realiseren.

Tabel 2: Succesfactoren voor adoptie van e-HRM

Factor	Omschrijving	Relatie	Maatregelen
Interne marketing e-HRM +	Promotie van e-HRM binnen de organisatie	Wanneer e-HRM goed intern wordt vermarkt dan wordt dit positief geassocieerd met adoptie van e-HRM	7. Demonstraties over het nieuwe systeem 8. Nieuwsbrieven met status updates 9. Trainingen en handleidingen om personen te leren werken met systeem 10. Aanwijzen van één of meerdere promotors van e-HRM
Organisatiecultuur +	De mate waarin de normen, het klimaat en de attitudes binnen de organisatie positief staat ten opzichte van nieuwe techniek.	Een innovatieklimaat of organisatiecultuur welke positieve attitudes bevat jegens e-HRM wordt positief geassocieerd met adoptie van e-HRM, mits de verantwoordelijkheid over het systeem onder andere bij de IT afdeling ligt.	11. Bepaal welke cultuur dominant is. 12. Wanneer het innovatieklimaat niet positief is ten aanzien van e-HRM kunnen maatregelen worden getroffen teneinde het klimaat positief te beïnvloeden, bijvoorbeeld door middel van verandermanagement.
Configuratie van P&O afdeling +	Aanwezigheid van een formele P&O afdeling met strategische focus	De aanwezigheid van een formele P&O afdeling en een P&O afdeling met strategische focus wordt positief geassocieerd met adoptie van e-HRM.	13. Formaliseren P&O afdeling. 14. Formele processen en eenduidig beleid implementeren . 15. P&O onderdeel maken van bedrijfsstrategie
P&O's IT-absorberende capaciteit +	De capaciteit van medewerkers om relevante kennis te ontwikkelen, belangrijke externe sturingsinformatie te herkennen, juiste beslissingen te nemen en effectieve werkprocessen en structuren ten aanzien van IT te implementeren.	Een hogere mate van IT-absorberende capaciteit wordt positief geassocieerd met adoptie van e-HRM, mits de verantwoordelijkheid over het systeem bij de IT afdeling ligt.	16. Absorberende capaciteit kan bevorderd worden door middel van trainingen om kennis en kunde te bevorderen en duidelijke interne communicatie over de implicaties en het potentieel van het systeem.
e-HRM project in handen van P&O +	Het project dient geleid te worden door een verantwoordelijke van de P&O-afdeling. Veelal zal dit een P&O manager betreffen gezien de brede kennis over de afdeling.	Wanneer het e-HRM project geleid worden door een verantwoordelijke van de P&O afdeling wordt dit positief geassocieerd met adoptie van e-HRM.	17. Wijs een verantwoordelijke aan vanuit de P&O afdeling. Bij voorkeur de persoon met de meeste kennis en vaardigheden op het gebied van P&O die eveneens de capaciteit bezig om mensen achter zich te scharen (veelal manager).

Factoren die bijdragen aan het behalen van beoogde doelstellingen

Het bereiken van strategisch HRM is een doelstelling die veel bedrijven nastreven, maar die vaak ook het moeilijkst te bewerkstelligen is. Met name omdat de maatregelen die het bereiken van dit doel faciliteren niet altijd duidelijk zijn, niet op een juiste wijze worden toegepast en niet voor elke organisatie toepasbaar zijn. Ook hierbij onderscheiden we in ons onderzoek technologische, organisatorische en menselijke factoren. Zo vonden we dat de *kwaliteit van de inhoud van een e-HRM systeem* positief samenhangt met strategische HRM effectiviteit (Bondarouk et al., 2009). Wanneer organisaties dus de strategische bijdrage van HRM willen vergroten, blijkt het van groot belang om de inhoud van het systeem goed af te stemmen op de behoeften van de gebruikers. Dit lijkt een open deur, maar wordt in veel organisaties, veelal vanwege budgettaire redenen, niet volledig toegepast.

Een andere factor die bijdraagt aan strategische HR effectiviteit is het *type informatie dat wordt opgeslagen* en de *wijze waarop informatie wordt gebruikt* (Ball, 2001). Dit hangt mede samen met de eerdergenoemde IT-absorberende capaciteit van de P&O afdeling, maar is tevens afhankelijk van de mate waarin de HR afdeling betrokken wordt bij strategisch beleid. Wanneer bijvoorbeeld HR planning een integraal onderdeel wordt van de strategie van de organisatie, kunnen P&O-medewerkers de focus verschuiven van administratieve werkzaamheden naar meer analytische werkzaamheden die directer bijdragen aan de strategie.

Mocht een organisatie streven naar meer dienstverlenend HR dan dient onder andere overwogen te worden in hoeverre medewerkers de *keuze hebben uit een HRM-systeem*: e-HRM of face-2-face. Wanneer medewerkers de keus krijgen uit beide systemen, voelen zij zich minder geschonden in hun privacy en zijn zij meer tevreden met P&O-dienstverlening (Lukaszewski et al., 2008). Met name in geval van medische informatie stellen medewerkers het op prijs om de situatie mondeling met een P&O medewerker te bespreken.

Tabel 3: Succesfactoren voor te behalen doelstellingen met e-HRM

Factor	Omschrijving	Relatie	Maatregelen
Kwaliteit van e-HRM inhoud +	In hoeverre de inhoud van het e-HRM systeem overeenkomt met de behoeften van de gebruikers.	Een hogere kwaliteit van e-HRM wordt geassocieerd met het bereiken van strategische HRM doelen.	10. Voorafgaand aan de implementatie in kaart brengen wat de behoeften en eisen van de gebruikers zijn. 11. Vervolgens het systeem zo goed mogelijk afstemmen op behoeftes en eisen.
Type informatie dat wordt opgeslagen en wijze waarop deze wordt gebruikt +	De mate waarin er informatie wordt opgeslagen en gebruikt voor administratieve doeleinden of strategische doeleinden (stuurinformatie)	Wanneer de IT-absorberende capaciteit van medewerkers hoog is en de afdeling P&O betrokken wordt bij strategievorming en –uitvoering dan is het behalen van strategische HR effectiviteit aannemelijker	1. Maak van P&O een onderdel van strategievorming en –uitvoering. 2. Onderwijs medewerkers over wijze van informatiegebruik en maak hen bewust van de potentie van e-HRM.
Keuze HR systeem +	De mate waarin medewerkers de keus hebben om gebruik te maken van e-HRM of face-2-face met een HR professional te kunnen interacteren.	Wanneer medewerkers de keus hebben uit verschillende HR systemen zullen zij zich minder geschonden voelen in hun privacy en de kwaliteit van HR dienstverlening als hoger beoordelen.	12. Geef medewerkers de keus uit HR systemen. Dit is met name gewenst bij HR kwesties die intensieve interactie vergen of kwesties waarbij de privacy van een medewerker in het geding komt (bijvoorbeeld medische kwesties).

Lessons learned

Als we kijken naar de selectie van factoren die hierboven zijn beschreven valt het belang van het menselijk aspect op. Alhoewel dit aspect bij elke implementatie van een informatiesysteem in ogenschouw moet worden genomen, is het nergens zo alomvattend als bij een e-HRM-implementatie. Niet verwonderlijk, wanneer u zich bedenkt dat e-HRM een organisatiebreed bereik heeft, de informatiesoort veelal privacygevoelige personeelsinformatie behelst en het kan bijdragen aan de complete verandering van de HR-afdeling. Wanneer alle literatuur vanaf de jaren ’70 in deze conclusie wordt meegenomen valt op te maken dat wetenschappers zich door de jaren heen steeds meer bewust zijn geworden van de menselijke succesfactor. Waar de eerste onderzoekers zich voornamelijk richtten op technologie, lijkt dat tegenwoordig vrijwel geen obstakel meer te zijn voor het behalen van succes met e-HRM.

Voor zowel het succes van een adoptie als voor het behalen van doelstellingen spelen de wijze waarop wordt ingespeeld op de organisatiecultuur, de attitudes en kennis van de werknemers dus een cruciale rol. Echter blijft het de interactie tussen technologische, organisatorische en menselijke factoren die uiteindelijk de doorslag geeft.

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Het volledige onderzoek naar alle succesfactoren en relaties voor e-HRM zal binnenkort in een uitgebreid artikel online verschijnen. Op basis hiervan is een model ontwikkeld dat organisaties helpt om te bepalen in hoeverre e-HRM succesvol kan worden geïmplementeerd in hun organisatie en op welke onderdelen zij maatregelen moeten treffen.

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Extra appendix C. **e-HRM tool**

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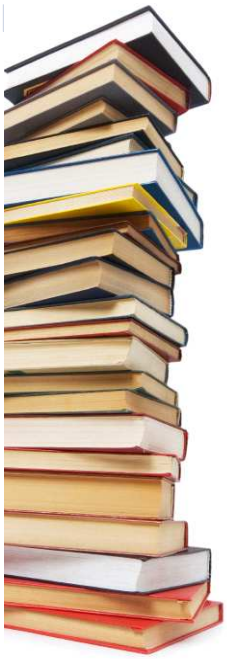

Uitleg adviestool voor adoptie en succes van e-HRM

N.B. Deze tool dient slechts als voorbeeld en is derhalve alleen bedoeld voor bepalen van de mate van succes voor de adoptie van e-HRM. Het onderzoeken of uw organisatie beschikt over voldoende succesfactoren voor het succesvol selecteren en implementeren van e-HRM, kunt u aanvragen bij Mitopics.

- In tabblad 'Vragen' krijgt u per vraag drie antwoordmogelijkheden. Deze staan respectievelijk in de kolommen D, F en H. Beantwoord de vraag zo goed mogelijk en vul een '1' in de kolom rechts van het door u gekozen antwoord.

- Na het invullen van alle vragen, gaat nu naar tabblad 'Scores'

- In rij 4 ziet u per consequentie ("doel") in hoeverre de mate waarin de succesfactoren aanwezig zijn in uw organisatie. 100% betekent dat alle relevante factoren in de hoogst mogelijke mate aanwezig zijn. 0% betekent dat geen van de relevante factoren aanwezig zijn in uw organisatie.

- Vanaf rij 5 ziet u voor de consequenties ("doelen") waar u per factor ("oorzaak") nog acties op kunt ondernemen.
Bij consequenties ("doelen") waar uw organisatie nog niet voldoende scoort (<50% van de totaal te behalen score per consequentie/doel) worden tekens getoond. Een "M" betekent dat u deze factor ("oorzaak") moet behouden en bewaken, een "A" betekent dat u op deze factor ("oorzaak") actie dient te ondernemen in de vorm van maatregelen.

-De tabbladen 'Matrix' en 'tussenmatrix' zijn slechts bedoeld als rekenbladen en dienen derhalve niet te worden geraadpleegd voor het advies.

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Vul in de kolommen E, G of I uw antwoord in met een '1'. U kunt per rij (per vraag) maar in één kolom een 1 neerzetten. Dit betekent dat u maar één antwoord kan geven op een vraag. U herkent de plekken waar u een antwoord kunt geven aan de lichtgeel gearceerde cellen. Wanneer u alle vragen heeft beantwoord, gaat u naar het tabblad Scores om te kijken naar de implicaties van uw antwoorden.

	Vragen	Antwoord-mogelijkheid 1	'1' invullen of leeg laten	Antwoord-mogelijkheid 2	'1' invullen of leeg laten	Antwoord-mogelijkheid 3	'1' invullen of leeg laten	
	e-HRM factoren die adoptie beïnvloeden							
1	Hoe beoordeelt u de moderniteit van de IT-infrastructuur binnen uw organisatie?	Gedateerd		Voldoet aan de eisen van de huidige tijd		Geavanceerd / toekomstbestendig		U dient nog een antwoord te geven op deze vraag
2	In hoeverre zijn er (computer)werkplekken beschikbaar voor de medewerkers? (in het bijzonder voor werknemers die voor hun dagelijkse werkzaamheden geen computer ter beschikking krijgen gesteld, maar dit wel met e-HRM nodig hebben)	Niet beschikbaar		Niet voor iedereen beschikbaar		Voor iedereen voldoende beschikbaar		U dient nog een antwoord te geven op deze vraag
3	Hoe beoordeelt u de expertise van de medewerkers op het gebied van HR-systemen?	Geen tot weinig ervaring		Een groot deel van de medewerkers heeft enige ervaring met HR systemen		Veel medewerkers hebben in het verleden ervaring opgedaan met één of meerdere HR systemen		U dient nog een antwoord te geven op deze vraag
4	Hoe beoordeelt u de capaciteit van de HR-afdeling om effectief te leren werken met nieuwe IT-systemen, ofwel: haalt de afdeling eruit wat erin zit?	Laag		Gemiddeld		Hoog		U dient nog een antwoord te geven op deze vraag
5	In hoeverre is er binnen de organisatie expertise op het gebied van verandermanagement aanwezig?	Niet aanwezig		Gemiddeld aanwezig		Sterk aanwezig		U dient nog een antwoord te geven op deze vraag
6	In hoeverre is het werken georganiseerd volgens 'het nieuwe werken'?	Niet		Enigszins		Volledig		U dient nog een antwoord te geven op deze vraag
7	In hoeverre is er een formele HR-afdeling aanwezig?	Niet		Enigszins - voor enkele taken en processen zijn formele rollen		Volledig		U dient nog een antwoord te geven op deze vraag
8	In hoeverre is de HR afdeling strategisch georienteerd?	Niet		Enigszins		Volledig - de HR afdeling is in staat om advies te geven bij het opstellen van het strategisch organisatiebeleid		U dient nog een antwoord te geven op deze vraag
9	Welke afdeling krijgt de eindverantwoordelijkheid en aansprakelijkheid over het e-HRM systeem?	IT afdeling		HR afdeling		IT & HR afdeling in samenspraak met elkaar		U dient nog een antwoord te geven op deze vraag
10	In hoeverre zijn de HR processen reeds in kaart gebracht?	Niet		Gedeeltelijk		Volledig		U dient nog een antwoord te geven op deze vraag
11	In hoeverre zijn de behoeften voor het systeem vanuit de HR-afdeling in kaart gebracht?	Niet		Enigszins		Volledig - er zijn functionele eisen gesteld, de huidige en toekomstige IT-infrastructuur is geschetst, de gewenste management informatie is in kaart gebracht, de eisen t.a.v. de performance en beschikbaarheid zijn duidelijk, knel- en verbeterpunten t.a.v. de huidige informatievoorziening zijn inzichtelijk gemaakt		U dient nog een antwoord te geven op deze vraag
12	Welke afdeling zal de leiding over het project krijgen?	Onduidelijk wie de leiding heeft		Een andere afdeling dan de HR afdeling		De HR-afdeling		U dient nog een antwoord te geven op deze vraag
13	In hoeverre zijn de doelen die u heeft met e-HRM in kaart gebracht?	Niet		Enigszins		Volledig - de doelen zijn bekend, zowel strategisch, tactisch en operationeel (op domeinen organisatie, techniek, mensen) en zijn concreet (S.M.A.R.T.) gesteld		U dient nog een antwoord te geven op deze vraag
14	Hoe verloopt momenteel de samenwerking tussen de HR en de IT-afdeling?	Slecht		Redelijk		Goed		U dient nog een antwoord te geven op deze vraag
15	In hoeverre is er een aantoonbare behoefte tot e-HRM?	Niet		Enigszins		Volledig		U dient nog een antwoord te geven op deze vraag
16	In hoeverre heeft u kunnen aantonen dat e-HRM zichzelf zal terug verdienen?	Niet		Enigszins		Volledig - op basis van een business case is inzichtelijk gemaakt hoe naast de kwalitatieve voordelen e-HRM zich terugverdient door besparingen kwantitatief te benoemen		U dient nog een antwoord te geven op deze vraag
17	In hoeverre hebben de HR-managers en IT-managers dezelfde visie over e-HRM?	Niet		Enigszins		Volledig		U dient nog een antwoord te geven op deze vraag
18	In hoeverre heeft u voldoende financiële middelen tot uw beschikking om de beoogde doelen te behalen?	Niet - er is onvoldoende budget voor de beoogde doelgroep van HR pakketten o.b.v. eerste indruk benodigde functionaliteit (low-, mid- of high-end HR pakketten)		Enigszins		Volledig - er is voldoende ruimte voor de beoogde investeringsbehoefte en ruimte voor nog te voorziene posten die later in de selectie pas fixed gesteld kunnen worden		U dient nog een antwoord te geven op deze vraag
19	Hoe kenmerkt u de organisatiecultuur in termen van technologievriendelijkheid?	Niet technologievriendelijk		Enigszins technologievriendelijk		Volkomen technologievriendelijk - men staat open voor adoptie van nieuwe innovatieve technologiën		U dient nog een antwoord te geven op deze vraag
20	Hoe kenmerkt u de ontvankelijkheid van de HR-afdeling ten aanzien van innovaties?	Laag		Gemiddeld		Hoog - men staat positief tegenover procesoptimalisaties en organisatorische verbeterpunten		U dient nog een antwoord te geven op deze vraag

Hoe beoordeelt u de IT-vaardigheden van HR professionals?	Laag		Gemiddeld		Hoog		U dient nog een antwoord te geven op deze vraag
Hoe beoordeelt u de IT-vaardigheden van medewerkers?	Laag		Gemiddeld		Hoog		U dient nog een antwoord te geven op deze vraag
Hoe beoordeelt u de PC-vaardigheden van medewerkers?	Laag		Gemiddeld		Hoog		U dient nog een antwoord te geven op deze vraag
Hoe beoordeelt u de PC-vaardigheden van managers?	Laag		Gemiddeld		Hoog		U dient nog een antwoord te geven op deze vraag
In hoeverre heeft u de beschikking over een visionaire, ondersteunende en stimulerende projectleider?	Geen		Enigszins		Volledig		U dient nog een antwoord te geven op deze vraag
In hoeverre is/zijn er binnen de organisatie e-HRM promotors aanwezig?	Niet		Enigszins		Sterk - op elke afdeling/business unit is een sponsor t.a.v. e-HRM		U dient nog een antwoord te geven op deze vraag
Hoe beoordeelt u de mindset van medewerkers richting e-HRM?	Negatief		Neutraal		Positieve houding tegenover e-HRM		U dient nog een antwoord te geven op deze vraag
In hoeverre is er een voorkeur binnen de organisatie voor een HR-professional in een strategische rol?	Geen voorkeur		Neutraal		Sterke voorkeur		U dient nog een antwoord te geven op deze vraag
In hoeverre is er een voorkeur binnen de organisatie voor een HR-professional in een ondersteunende/administratieve rol?	Sterke voorkeur voor ondersteunende/administratieve rol		Neutraal		Geen voorkeur		U dient nog een antwoord te geven op deze vraag
Hoe beoordeelt u de overtuigingen ten aanzien van het relatieve voordeel van het systeem?	Negatief		Neutraal		Positief		U dient nog een antwoord te geven op deze vraag
In hoeverre is er binnen de organisatie weerstand vanuit het personeel tegen verandering?	Sterk aanwezig		Gemiddeld aanwezig		Niet aanwezig		U dient nog een antwoord te geven op deze vraag
In hoeverre heerst er binnen de organisatie angst voor inbreuk op de privacy?	Sterk aanwezig		Gemiddeld aanwezig		Niet aanwezig		U dient nog een antwoord te geven op deze vraag
Hoe beoordeelt u het groepsmoreel binnen de organisatie?	Zwak		Matig		Sterk		U dient nog een antwoord te geven op deze vraag
Hoe beoordeelt u de mate van werkstress binnen de organisatie?	Hoog		Gemiddeld		Laag		U dient nog een antwoord te geven op deze vraag
Hoe beoordeelt u de mate van zelfverzekerdheid van de medewerkers tav hun eigen technologische vaardigheden?	Laag		Gemiddeld		Hoog		U dient nog een antwoord te geven op deze vraag
Hoe beoordeelt u de werktevredenheid binnen de organisatie?	Laag		Gemiddeld		Hoog		U dient nog een antwoord te geven op deze vraag
Hoe beoordeelt u de perceptie van de medewerkers ten aanzien van het HR personeel?	Negatief		Neutraal		Positief		U dient nog een antwoord te geven op deze vraag
In hoeverre is het management toegewijd aan het e-HRM project?	Het management is niet bereid om het e-HRM project in voldoende mate te ondersteunen, te financieren en te faciliteren		Gemiddeld		Het management is bereid om het e-HRM project in voldoende mate te ondersteunen, te financieren en te faciliteren		U dient nog een antwoord te geven op deze vraag
In hoeverre zijn medewerkers toegewijd aan het e-HRM project?	Medewerkers zijn onvoldoende bereid om het e-HRM te ondersteunen en uit te dragen in de organisatie		Gemiddeld		Medewerkers zijn voldoende bereid om het e-HRM te ondersteunen en uit te dragen in de organisatie		U dient nog een antwoord te geven op deze vraag
In hoeverre is er prioriteit vanuit het top management voor het implementeren van e-HRM?	Lage prioriteit		Gemiddelde prioriteit		Hoge prioriteit		U dient nog een antwoord te geven op deze vraag
Hoe beoordeelt u de toewijding van het top management richting de e-HRM strategie?	Laag		Gemiddeld		Hoog		U dient nog een antwoord te geven op deze vraag
In hoeverre is de invloed van een vakbond op het organisatiebeleid merkbaar?	Niet		Enigszins		Sterk		U dient nog een antwoord te geven op deze vraag

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	Vragen	U heeft nog niet alle vragen beantwoord! Behaalde score →	Adoptie van E-HRM 0%	Consequentie 1 n.v.t.	Consequentie 2 n.v.t.	Consequentie 3 n.v.t.	Consequentie 4 n.v.t.	Consequentie 5 n.v.t.	Consequentie 6 n.v.t.	Consequentie 7 n.v.t.	Consequentie 8 n.v.t.	Consequentie 9 n.v.t.	Consequentie 10 n.v.t.	Consequentie 11 n.v.t.	Consequentie 12 n.v.t.
	e-HRM factoren die consequenties beïnvloeden	Gegeven antwoord ↓													
1	Hoe beoordeelt u de moderniteit van de IT-infrastructuur binnen uw organisatie?	Geen antwoord nog gegeven		Dit voorbeeld van de adviestool e-HRM bevat alleen de vragen en scoring voor adoptie van e-HRM. De volledige tool kent nog een uitgebreide analyse en scoring op de mogelijke consequenties ("doelen") met een totaal aantal vragen van 60. Hiermee bent u in staat om te kijken in hoeverre uw organisatie de te behalen doelen haalbaar zijn, gegeven de beantwoording van vragen m.b.t. succesfactoren.										
2	In hoeverre zijn er (computer)werkplekken beschikbaar voor de medewerkers? (in het bijzonder voor werknemers die voor hun dagelijkse werkzaamheden geen computer ter beschikking krijgen gesteld, maar dit wel met e-HRM nodig hebben)	Geen antwoord nog gegeven													
3	Hoe beoordeelt u de capaciteit van de HR-afdeling om effectief te leren werken met nieuwe IT-systemen, ofwel: haalt de afdeling eruit wat erin zit?	Geen antwoord nog gegeven													
4	In hoeverre is er binnen de organisatie expertise op het gebied van verandermanagement aanwezig?	Geen antwoord nog gegeven													
5	In hoeverre is het werken georganiseerd volgens 'het nieuwe werken'?	Geen antwoord nog gegeven													
6	In hoeverre is er een formele HR-afdeling aanwezig?	Geen antwoord nog gegeven													
7	In hoeverre is de HR afdeling strategisch georienteerd?	Geen antwoord nog gegeven													
8	Welke afdeling krijgt de eindverantwoordelijkheid en aansprakelijkheid over het e-HRM systeem?	Geen antwoord nog gegeven													
9	In hoeverre zijn de HR processen reeds in kaart gebracht?	Geen antwoord nog gegeven													
10	In hoeverre zijn de behoeften voor het systeem vanuit de HR-afdeling in kaart gebracht?	Geen antwoord nog gegeven													
11	Welke afdeling zal de leiding over het project krijgen?	Geen antwoord nog gegeven													
12	In hoeverre zijn de doelen die u heeft met e-HRM in kaart gebracht?	Geen antwoord nog gegeven													
13	Hoe verloopt momenteel de samenwerking tussen de HR en de IT-afdeling?	Geen antwoord nog gegeven													
14	In hoeverre is er een aantoonbare behoefte tot e-HRM?	Geen antwoord nog gegeven													
15	In hoeverre heeft u kunnen aantonen dat e-HRM zichzelf zal terug verdienen?	Geen antwoord nog gegeven													
16	In hoeverre hebben de HR-managers en IT-managers dezelfde visie over e-HRM?	Geen antwoord nog gegeven													
17	In hoeverre zijn de HR processen reeds in kaart gebracht?	Geen antwoord nog gegeven													
18	In hoeverre heeft u voldoende financiële middelen tot uw beschikking om de beoogde doelen te behalen?	Geen antwoord nog gegeven													
19	Hoe kenmerkt u de organisatiecultuur in termen van technologievriendelijkheid?	Geen antwoord nog gegeven													
20	Hoe kenmerkt u de ontvankelijkheid van de HR-afdeling ten aanzien van innovaties?	Geen antwoord nog gegeven													
21	Hoe beoordeelt u de IT-vaardigheden van HR professionals?	Geen antwoord nog gegeven													
22	Hoe beoordeelt u de IT-vaardigheden van medewerkers?	Geen antwoord nog gegeven													
23	Hoe beoordeelt u de PC-vaardigheden van medewerkers?	Geen antwoord nog gegeven													
24	Hoe beoordeelt u de PC-vaardigheden van managers?	Geen antwoord nog gegeven													
25	In hoeverre heeft u de beschikking over een visionaire, ondersteunende en stimulerende projectleider?	Geen antwoord nog gegeven													
26	In hoeverre is/zijn er binnen de organisatie e-HRM promotors aanwezig?	Geen antwoord nog gegeven													
27	Hoe beoordeelt u de mindset van medewerkers richting e-HRM?	Geen antwoord nog gegeven													
28	In hoeverre is er een voorkeur binnen de organisatie voor een HR-professional in een strategische rol?	Geen antwoord nog gegeven													
29	In hoeverre is er een voorkeur binnen de organisatie voor een HR-professional in een ondersteunende/administratieve rol?	Geen antwoord nog gegeven													
30	Hoe beoordeelt u de overtuigingen ten aanzien van het relatieve voordeel van het systeem?	Geen antwoord nog gegeven													
31	In hoeverre is er binnen de organisatie weerstand vanuit het personeel tegen verandering?	Geen antwoord nog gegeven													
32	In hoeverre heerst er binnen de organisatie angst voor inbreuk op de privacy?	Geen antwoord nog gegeven													
33	Hoe beoordeelt u het groepsmoreel binnen de organisatie?	Geen antwoord nog gegeven													
34	Hoe beoordeelt u de mate van werkstress binnen de organisatie?	Geen antwoord nog gegeven													
35	Hoe beoordeelt u de mate van zelfverzekerdheid van de medewerkers tav hun eigen technologische vaardigheden?	Geen antwoord nog gegeven													
36	Hoe beoordeelt u de werktevredenheid binnen de organisatie?	Geen antwoord nog gegeven													
37	Hoe beoordeelt u de perceptie van de medewerkers ten aanzien van het HR personeel?	Geen antwoord nog gegeven													
38	In hoeverre is het management toegewijd aan het e-HRM project?	Geen antwoord nog gegeven													
39	In hoeverre zijn medewerkers toegewijd aan het e-HRM project?	Geen antwoord nog gegeven													
40	In hoeverre is er prioriteit vanuit het top management voor het implementeren van e-HRM?	Geen antwoord nog gegeven													
41	Hoe beoordeelt u de toewijding van het top management richting de e-HRM strategie?	Geen antwoord nog gegeven													
42	In hoeverre is de invloed van een vakbond op het organisatiebeleid merkbaar?	Geen antwoord nog gegeven													