

# Electronic HRM: From Implementation to Value Creation

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**Abstract.** The paper presents results of the quantitative study into enablers and value creation of e-HRM systems. The findings supported by the analysis of 210 questionnaires, have revealed that the most significant enabler of e-HRM implementation is HRM system strength, while characteristics of the IT functionality also played an important role. The main result of the e-HRM usage was observed as effectiveness of HR administrative processes, but not Re-structuring of the HR function as usually expected from the introduction of e-HRM in organizations.

## 1 Introduction

There is a growing body of literature reporting on different aspects of Human Resource Information Systems (HRIS) and electronic HRM (e-HRM). A lot has been done to identify potentials of e-HRM for HRM strategy implementation ([13], [31]), types and goals of e-HRM ([18], [26]), and impact of e-HRM on different stakeholder groups [24]. However, research on the success factors of e-HRM implementation is scarce. Studies which examine influences of IT, HRM and organizational characteristics on e-HRM implementation are characterized by taking a single dominant approach, either IT- or HRM-centered. Having acknowledged the definition of e-HRM as

*a way of implementing HR strategies, policies, and practices in organization through conscious and directed support of and/or with the full use of web-technology-based channels [26],*

we should probably, focus on an integration between IT and HRM, and approach the success factors from an integrated perspective. This study proposes a model that puts forward enablers of e-HRM implementation and indicators of its success. Through testing the model, our paper strives to partially close the gap in the existing literature on success of e-HRM, and answer the question, what the success enablers of e-HRM are, and what value e-HRM creates for organizations.

## 2 Theoretical Framework and Development of Hypotheses

Talking about e-HRM value, we should notice that we define it as the capacity of electronic HRM to satisfy a need or provide a benefit to a person or an organization. [11]. When implemented successfully, e-HRM has the ability to provide benefits to employees and organizations and thus to create value. Building on theoretical debates found in earlier studies on Electronic Performance Monitoring and debates on functional/dysfunctional consequences of e-HRM applications [29], [28] the intended and unintended consequences that e-HRM might have for organizations and individuals are summarized in Table 1. As the table shows, we view three aspects that are affected by the implementation of e-HRM: information flow, social interactions, and perceived control. All three aspects might be jointly influenced by the nature of e-HRM systems, and individuals' attitudes, intentions, and behaviors.

**Table 1.** Potential consequences of e-HRM.

Affected aspects	Intended consequence of e-HRM	Unintended consequence of e-HRM
Information flow	<ul style="list-style-type: none"> <li>- It may increase the organization's ability to access, collect, and disseminate information</li> <li>- Greater amounts of information</li> <li>- Easier access to information about roles requirements</li> <li>- Accuracy and timeliness of HR transactions</li> </ul>	<ul style="list-style-type: none"> <li>- Information overload</li> <li>- Failure to create "high" quality information</li> <li>- Uncertainty, ambiguity, complexity of HR information</li> <li>- Increase of a number of alternatives</li> <li>- Amount of out-dated information</li> </ul>
Social interactions	<ul style="list-style-type: none"> <li>- It may modify social interaction patterns (substitution for face-to-face communications)</li> <li>- Increase of standardization in communications</li> <li>- Fairness in sending messages about performance management</li> </ul>	<ul style="list-style-type: none"> <li>- Decreased social interaction between supervisors and subordinates</li> <li>- Increased psychological distance between supervisors and subordinates</li> <li>- Increased feelings of social isolation</li> <li>- Invasion in personal privacy</li> </ul>
Perceived control	<ul style="list-style-type: none"> <li>- Increase control of employees behavior</li> </ul>	<ul style="list-style-type: none"> <li>- Work stress</li> <li>- Increased anxiety stemming from "invasion of privacy"</li> </ul>

Lepak and Snell [18] refer to the four 'pressures' of virtual HRM: they must be strategy-focused, flexible, efficient and client-oriented; and all this at the same time. Ruël et al. [26] highlighted an aspect that is fairly well covered by the above but that is nevertheless interesting to spell out, namely the changing nature of the employment relationship. With the supply shortage in the labour market (during the economic upturn of the 1990s), the individualization of society, and the higher educational level of citizens (and thus of employees), the power balance in the employment relationship has shifted in the direction of the employees: they want to steer their own career paths. In the view of Ruël et al. [26], a move towards e-HRM can provide the tools to support this development. This aspect fits into earlier-mentioned drivers such as improving service towards internal clients, but has an external societal drive. Theoretical debates suggest that the three goals of e-HRM are cost reduction, improvement of HR services and improvement of strategic orientation ([4], [18], [30]).

When goals or results have a positive influence on employees or the organization, combined with the intended consequences of e-HRM (Table 1), the goals and results also contribute to the value creation of e-HRM. For the purpose of this paper we distinguish the following categories of e-HRM value creation: Time spent on HR activities, HRM roles, HRM service quality, Efficiency, Perceived effectiveness of electronic HR practices. Those are, in our view, integrate the notion of the e-HRM goals and anticipated positive consequences of e-HRM in organizations. Besides the above mentioned factors, it is expected that e-HRM will also diminish role ambiguity, and will contribute to the uniqueness of HRM. Role ambiguity, Time spent on HR activities and HRM roles together form the block: restructuring of the HR function. Uniqueness of HRM, HRM service quality and Efficiency form the block: HRM effectiveness. Perceived effectiveness of electronic HR practices is a block itself.

**Restructuring of the HR Function.** Restructuring of the HR function consists of three aspects: Role ambiguity, Time spent on HR activities and HR roles. *Role ambiguity is viewed as the lack of necessary information available to a given organizational position [25].* Through e-HRM, most organizations implement databases with relevant HR information, which is accessible to HR professionals, line managers and partly to employees. This database provides more information, the accuracy of this available information is expected to increase, and the information is expected to be easier accessible (Table 1). Therefore e-HRM is believed to diminish role ambiguity. The implementation of e-HRM is viewed to lead to changes in HR processes and functions in the organizations. This has influence on the HRM roles and the time that HR professionals, employees and line managers spend on HR activities. We have tried to cover these role changes with the four different roles classified by Ulrich and Brockbank [33]: Employee Advocate, Human Capital Developer, Functional Expert, Strategic partner/change agent. Our first hypothesis is therefore:

*H1. Through the implementation of e-HRM HR professionals will improve their strategic orientation, spend less time on HR administration, and will diminish roles ambiguity.*

**HRM Uniqueness and Service Quality.** The Uniqueness is considered as the degree to which a combination of face-to-face and electronic HRM practices is rare, specialized, and firm specific. When an organization is able to implement this unique combination of HRM and e-HRM it can create a competitive advantage and hereby create value. Another aspect of HRM effectiveness is the HRM service quality. Service quality involves not only the outcome of the e-HRM system but also the way the service is delivered. To ensure good quality, service quality should exceed customer expectations of the service [23]. By improving the service level of the HRM department through the implementation of e-HRM, e-HRM can add value to the organization. e-HRM can help to increase the efficiency of the organization by for example cost reduction ([35], [26], [5]), time savings ([14],[30]) or improved decision making [14].

H2. *As a result of implementation of e-HRM, targeted organizational members will perceive their HRM services unique and of an increased quality.*

**Perceived Effectiveness of HR Administration.** The Perceived effectiveness of HR administration is the degree to which HR practices are perceived as useful and helpful. In this research, the perceived effectiveness of e-administration of personnel data is examined. E-administration is the electronic record keeping of all personnel data. It is expected that due to its electronic support and through the change of the process itself, the effectiveness of the HR administration shall increase.

H3. *As a result of e-HRM implementation, administration of HR processes will be perceived as more effective.*

A precondition for the success and thus value creation of an e-HRM application is the usage of the application. If the application is not used, the e-HRM application won't succeed. Usage is defined by appropriation and frequency of use. Appropriation is *the continuous, progressive, and mutual adjustments, accommodations, and improvisations between the technology and the users.* [22] or can be seen as the incorporation of information technology into one's life [27].

**Technological Strength.** People tend to use (or not) an application to the extent that they believe it will help them perform their job better (perceived usefulness). Further, even if people believe that a given application is useful, they may believe that the systems are too hard to work with and that the performance benefits of usage are outweighed by the efforts required using the application (ease-of-use). It was shown that usefulness is more strongly linked to actual system use than ease-of-use. The dominance of usefulness over ease-of-use has important implications for the designers and those responsible for implementation. Across the many empirical tests of TAM, perceived usefulness has consistently been a strong determinant of the usage intentions of employees. As of January 2000, the Institute for Scientific Information's *Social Science Citation Index*<sup>®</sup> listed no less than 424 journal citations to the article by Davis [6]. Within a decade, the TAM concept had been enriched by elaborating on various determinants of the perceived usefulness and ease-of-use. Besides these two important IT characteristics, another important aspect of an information system is the information quality of the system. Information quality is about the perceived importance and usefulness of the information in the information system [9].

H 4. *The usage of e-HRM will be determined by the technological strength consisting of usefulness, easiness of use, and data quality.*

**HRM System Strength.** Besides IT, HRM system strength is an important contributor to the success of e-HRM. An HRM system is the overall set of HR practices, programs, and philosophy in a company. The HR practices in a company can be seen as communication from employer to employee [3]. Through HR practices employees develop skills, knowledge and motivation to contribute to the organization's strategy. Thus the perceptions, attitudes and behaviors of employees are influenced through the HRM system. [2] HR practices should communicate unambiguous messages to employees about what is appropriate behavior. Attribution

theory states how people explain matters and the psychological consequences of these matters [10]. Individuals make correct attributions about HR practices based on three factors: the distinctiveness of the HRM system, the consistency of the HRM system, and the consensus of the HRM system.

H5. *The usage of e-HRM will be determined by the strength of the HRM system in organizations.*

**Employee Readiness for e-HRM.** When an organizational change is implemented, one of the most common reasons for failure is employees' resistance to change. The success of e-HRM is dependent on the voluntary cooperation of employees. The block Employee readiness for e-HRM consists of three factors: Facilitating conditions, Employee participation in the implementation of e-HRM and HR technological competencies. *Facilitating conditions are the degree to which an individual believes that an organizational and technical infrastructure exist to support use of the system* [34]. *Employee participation is the assignments, activities, and behaviors that users or their representatives perform during the systems development process* [1]. The last factor which contributes to Employee readiness is HR technological competencies. HR technological competencies are defined as a person's underlying attributes, such as their knowledge, skills, or abilities, necessary to accomplish e-HRM change. [12]

H6. *The usage of e-HRM will be determined by the employees readiness to work with e-HRM.*

### 3 Methodology

**Research Design.** The first step in this research is to conduct entry interviews. These interviews are held to explain the research purposes, to get information about the e-HRM application in use, and to customize the questionnaire. After these interviews, a questionnaire was developed about the success factors of e-HRM. The questionnaire was internet-based and entry-forced. Existing scales were used for most variables, where all constructs were measured by 5-point scales. The original scales were in English. However, since all participants in the survey were native Dutch speakers the questionnaire was translated into Dutch and back into English. The translation from English into Dutch was done in parallel by two independent translators. Before sending the questionnaire to the respondent, the questionnaire was checked by three academic researchers from three different universities to refine the questionnaire. A pilot test was conducted by experts and their suggestions were used to improve the content validity and the structure of the questionnaire. Finally the questionnaire was prototyped online by two academic researchers and two experts.

Companies were selected with help of contacts from Capgemini colleagues. Capgemini colleagues were asked for contact persons in companies. These contact persons were sent an invitation, including a short description of the model, an explanation of the research and benefits for the participating companies. Besides companies listed by colleagues, companies within the personal network of the researcher were approached. The last way of collecting information on companies

was by snowball sampling. This resulted in 12 companies showing interest in participating in an interview and discussing possibilities for the questionnaire. After the entry interviews, six companies agreed to participate in the research. Companies who refused indicated that they had too much workload in the organization and did not want to bother their employees with a questionnaire, or were afraid the questionnaire would result in resistance of the employees to the e-HRM application. The questionnaire was sent to the six companies with an accompanying email. This email explained the goal of the questionnaire and provided an estimated time required to fill out the questionnaire. A follow up email was sent after a week.

This resulted in 206 respondents who filled in the questionnaire. The response rate cannot be computed because it is not known for all companies to how many employees the questionnaire was sent.

**Measures.** The items in the questionnaire were organized per variable.

**IT Strength.** Usefulness, was defined as the degree to which a person believes that using a particular information system would enhance his job performance [6], Ease of use was defined as the degree to which the prospective user expects the information system to be free of effort [7], and Data quality was defined as the perceived importance and usefulness of the information in the information system [9].

For the constructs Ease of use and Usefulness items were based on Venkatesh [34]. Venkatesh used four items for Ease of use and Perceived usefulness. An item of Ease of use is e.g.: "Interacting with e-HRM technology requires a lot of mental effort". An example of Usefulness is: "I find e-HRM useful for dealing with my HR related activities". The constructs Intrinsic information quality and Contextual information quality are based on the scales of Lee et al [15]. Intrinsic information quality is referred to as: accuracy, believability, reputation and objectivity. The items used from the questionnaire are based on these concepts: e.g. "The data on the e-HRM site is reliable". The construct Contextual information quality has been described by Wang and Strong in Lee et al. [15] as: value-added, relevance, completeness, timeliness, and appropriate amount. So items from the questionnaire of Lee et al [15] were selected based on these keywords, like "The data on the e-HRM site is up-to-date for my HR tasks".

**HRM System Strength.** HRM system strength consists of three different variables: Distinctiveness, Consistency and Consensus. The distinctiveness of the HRM system are the features that allow a situation to stand out in the environment and to capture attention and interest. The consistency is the establishment of an effect over time and modalities regardless of the form of interactions. The consensus is the degree of agreement among individuals' views of the event-effect relationship. [3]

The questions about distinctiveness, consensus and consistency were adapted from Delmotte [8]. Only legitimacy and authority, which are part of distinctiveness, are self-constructed because the questions of Delmotte [8] do not correspond to the description of distinctiveness of this research. An example of an item of Consistency is: "There is a clear fit between HR promises and deliverables".

**Employee Readiness.** Employee readiness for e-HRM change consists of three variables: HR competencies as technology expertise, Facilitating conditions, and Employees participation in the e-HRM implementation. The construct HR competencies as technology expertise was self-constructed. An item of this scale is: “HR professionals in our organization have strong skills to use e-HRM applications”. Facilitating conditions were adapted from Venkatesh et al [34] and Marler et al [19]. The items from the questionnaire of Marler et al [19] are based on his construct Employee resources, which resemble Facilitating conditions. A selection was made from the questionnaire of Venkatesh et al [34] to limit the length of the questionnaire. For the construct Employee participation in the implementation of e-HRM, a selection was made from among the items from Barki and Hartwick [1]. Not all items could be used since the length of the questionnaire required to be limited. An example of an item in this construct is: “I helped creating users manuals for the e-HRM application”.

**Usage.** Usage consists of two variables: Appropriation and Frequency. The items of the construct Appropriation were adapted from Ruël [27]. Also in case of Appropriation not all items are used because of the magnitude of the questionnaire. An item from this scale is: “IT experts will not agree with my way of using the e-HRM tools”. The item from Frequency are self-constructed.

**Re-structuring of the HRM Function.** It included three variables, HR roles, roles ambiguity, and time spent on HR processes. The items of HR roles were adapted from Ulrich and Brockbank [33] , and four different roles were distinguished: Employee Advocate, Human Capital Developer, Functional Expert and Strategic Partner/Change Agent. One of the items on this scale is: “HR professionals develop HR activities to take care of employee personal needs”. Role ambiguities was adapted from Miller et al [20] and consisted of nine items. “The combination of traditional Human Resource Management and electronic Human Resource Management make me feel I have clear goals for my HR tasks” is an example of an item. Time spent is a self constructed measure. It consists of three variables: Time spent on HRM activities, Time spent on IT activities, and Time spent on HR administrative/transactional activities. An example of an item is: “Since the implementation of e-HRM I am increasingly involved in forecasting HR needs”.

**Uniqueness and Quality of HRM Services.** Included two variables, uniqueness and HRM services. Uniqueness of HRM was adapted from Lepak and Snell [17]. This variable consists of nine items, for example: “A combination of traditional Human Resource Management and electronic Human Resource Management in our organization would be very difficult to replace”. HR service quality is based on the questionnaires of Parasuraman et al [23]. An example is: “The HR services guarantee error-free administration”. The items within the variable Efficiency are self-constructed, for example: “Since the introduction of e-HRM, administration of HR documents is efficient”.

**Perceived Effectiveness of HR Administration.** Perceived effectiveness of electronic HR practices is self-constructed. An example of an item is: “I can access HR personal information at my early convenience”.

## 4 Results

Based on the correlation analysis, it can be concluded that sufficient correlations are found to be able to execute a regression analysis. A stepwise regression was chosen for this research. The regression analysis indicates that only Employee Readiness has a significant relation with Usage. IT and HRM system strengths do not have a significant relation with e-HRM Usage. Employee Readiness determines 28% of the Usage ( $R^2 = 0.276$ ). The relation with Usage is a strong positive relation ( $\beta = 0.697$ ), if an organization scores high on Employee Readiness, this organization scores also higher on the Usage of the e-HRM application. Usage determines 3% of Restructuring of the HR function, 13% of HRM Uniqueness, and 12% of Perceived Effectiveness of HR administration. However, as can be seen in the regression table below, the three success enablers (IT and HRM System Strengths, and Employee Readiness) determine 41% of HRM Uniqueness and quality of HR services. IT and HRM System Strengths determine 42% of Perceived Effectiveness of HRM administration. Based on the high  $R^2$  values, a direct relation between the success enablers and the value creating factors is a distinct possibility. IT strengths do have a strong positive influence ( $\beta = 0.552$ ) on the Perceived Effectiveness of HR administrative practices (Table 2).

**Table 2.** Regression analysis.

	Usage			Restructuring of HR function			Uniqueness and quality of HR services			Perceived effectiveness		
	R <sup>2</sup>	B	Sign (p)	R <sup>2</sup>	B	Sign (p)	R <sup>2</sup>	B	Sign (p)	R <sup>2</sup>	B	Sign (p)
IT Strength	.276	.102	.152	-	-	-	.411	.225	.000	.423	.552	.000
HRM System Strength		.049	.486	.052	.135	.001		.250	.000		.319	.000
Employee Readiness		.697	.000	-	-	-		.146	.018		.171	.083
Usage		-	-	.032	-.082	.010	.131	.244	.000	.123	.372	.000

The regression analysis at construct level leads to a lot of significant relations being found. Because of the number of significant relation, only the relations are shown in the table below.



**Table 3.** Regression analysis on construct level.

	Appropriation			Frequency			Role Ambiguity			Time spent on strategic activities		
	R <sup>2</sup>	β	Sign (p)	R <sup>2</sup>	β	Sign (p)	R <sup>2</sup>	β	Sign (p)	R <sup>2</sup>	β	Sign (p)
Ease of use	.275	.306	<b>.000</b>	.038	-	-	.236	-.083	.313	.139	.161	.234
Usefulness		.154	.077		.268	<b>.005</b>		-.429	<b>.000</b>		.490	.001
Data Quality		.187	<b>.006</b>		-	-		-.083	.283		.181	.124
Distinctiveness	.144	.157	.102	.043	.343	<b>.003</b>	.195	-.468	<b>.000</b>	.113	.498	.002
Consistency		.433	<b>.000</b>		.002	.982		-.172	.065		.157	.303
Consensus		.089	.227		-	-		-.109	.125		.156	.235
Participation	.300	-.006	.927	.143	.338	<b>.000</b>	.261	-.040	.534	.312	.482	.000
Competence		.136	<b>.043</b>		.077	.272		-.217	<b>.004</b>		.391	.008
Facilitating		.437	<b>.000</b>		.324	<b>.003</b>		-.403	<b>.000</b>		.131	.243
Appropriation Frequency							.297	-.349	<b>.000</b>	.135	-	-
								-.253	<b>.000</b>		.330	<b>.001</b>

	Time spent on IT Related activities			Time spent on Administr. activities			Employee Oriented role			Business Oriented role		
	R <sup>2</sup>	β	Sign (p)	R <sup>2</sup>	β	Sign (p)	R <sup>2</sup>	β	Sign (p)	R <sup>2</sup>	β	Sign (p)
Ease of use	.067	.293	<b>.018</b>	.083	.272	<b>.000</b>	.152	.151	.079	.150	.160	<b>.015</b>
Usefulness		.134	.341		.096	.337		.342	<b>.000</b>		.166	<b>.015</b>
Data Quality		-	-		.070	.433		.013	.873		.062	.460
Distinctiveness	-	-	-	.034	-	-	.488	.258	<b>.002</b>	.534	.217	<b>.002</b>
Consistency		-	-		-	-		.446	<b>.000</b>		.348	<b>.000</b>
Consensus		-	-		.231	<b>.024</b>		.257	<b>.000</b>		.342	<b>.000</b>
Participation	.323	.609	<b>.000</b>	.0027	-	-	.258	.019	.767	.291	-	-
Competence		-	-		-	-		.362	<b>.000</b>		.447	<b>.000</b>
Facilitating		.014	.894		.177	<b>.047</b>		.292	<b>.000</b>		.166	<b>.000</b>
Appropriation Frequency	.114	-	-	.028	.208	<b>.043</b>	.137	.294	<b>.000</b>	.131	.285	<b>.000</b>
		.292	<b>.002</b>		-	-		.136	<b>.001</b>		.095	<b>.011</b>

	Uniqueness			Service Quality			Efficiency			Perceived effectiveness		
	R <sup>2</sup>	β	Sign (p)	R <sup>2</sup>	β	Sign (p)	R <sup>2</sup>	β	Sign (p)	R <sup>2</sup>	β	Sign (p)
Ease of use	.055	.108	.236	.211	.189	<b>.004</b>	.295	-.021	.785	.391	.132	<b>.048</b>
Usefulness		.150	<b>.001</b>		.210	<b>.002</b>		.459	<b>.000</b>		.261	<b>.000</b>
Data Quality		.037	.665		.085	.293		.143	.053		.302	<b>.000</b>
Distinctiveness	.060	.083	.413	.328	.226	<b>.008</b>	.116	-.062	.539	.223	.228	<b>.023</b>
Consistency		.221	<b>.000</b>		.271	<b>.007</b>		.282	<b>.002</b>		.376	<b>.002</b>
Consensus		.117	.127		.226	<b>.002</b>		.183	<b>.033</b>		.095	.185
Participation	.132	.133	<b>.001</b>	.254	-	-	.173	-	-	.273	.030	.637
Competence		.231	<b>.000</b>		.391	<b>.000</b>		.278	<b>.000</b>		.236	<b>.002</b>
Facilitating		.093	.217		.207	<b>.000</b>		.237	<b>.000</b>		.417	<b>.000</b>
Appropriation Frequency	-	-	-	.162	.298	<b>.000</b>	.168	.429	<b>.000</b>	.216	.520	<b>.000</b>
		-	-		.132	<b>.001</b>		-	-		.091	.147

- = no correlation  
p = non significant  
**p** = significant

From the regression analysis at construct level, it appears that there is a significant relation between the constructs of IT strength and Usage and the construct of HRM system strength and Usage. However, this cannot be deduced from the regression analysis at the dimension level. Because of these contradictory findings, a complementary regression analysis was done at dimension level. The regression

analysis at construct level was executed by entering the three success enablers (IT and HRM system strengths and Employee readiness) simultaneously. This resulted in Employee readiness being highlighted as a very strong predictor of Usage. IT and HRM system strengths were then entered simultaneously in a stepwise regression analysis. Employee readiness was excluded from this analysis. As can be seen in table 4, it appears that IT and HRM system strengths do relate to Usage (Table 4).

**Table 4.** Regression IT Strength and HRM system Strength with Usage.

	Usage		
	R <sup>2</sup>	B	Sign (P)
IT Strength	.151	.283	.000
HRM System Strength		.223	.023

IT and HRM system strengths together determine 15.1% of Usage. Employee Readiness was such a strong predictor of Usage ( $\beta = 0.697$ ), that IT and HRM system strengths were excluded for that reason. However, because IT and HRM system strength do have a significant influence on Usage, both were included in the model.

Because IT and HRM system strength, and Employee readiness have an influence on Usage, and Usage has influence on Restructuring of the HR function, uniqueness of HRM and quality of HR services, and Perceived effectiveness of administrative HR practices, Usage could be a mediator and therefore the mediating influence of Usage needed to be tested. From the analysis, it appeared that Usage has a mediating effect on:

- IT strength and HRM uniqueness and HR services
- IT strength and Perceived effectiveness of HR administration
- HRM system strength and HRM uniqueness
- HRM system strength and Perceived effectiveness of HR administrative practices
- Employee readiness and HRM uniqueness
- Employee readiness and Perceived effectiveness of HR administrative practices

There is no mediating effect of Usage on Restructuring of the HR function. Figure 1 shows the final research model. As can be seen, the success enablers have a direct effect on the value creators, but there is also an effect with Usage a mediator.

We summarize the findings per hypothesis in Table 5 below.

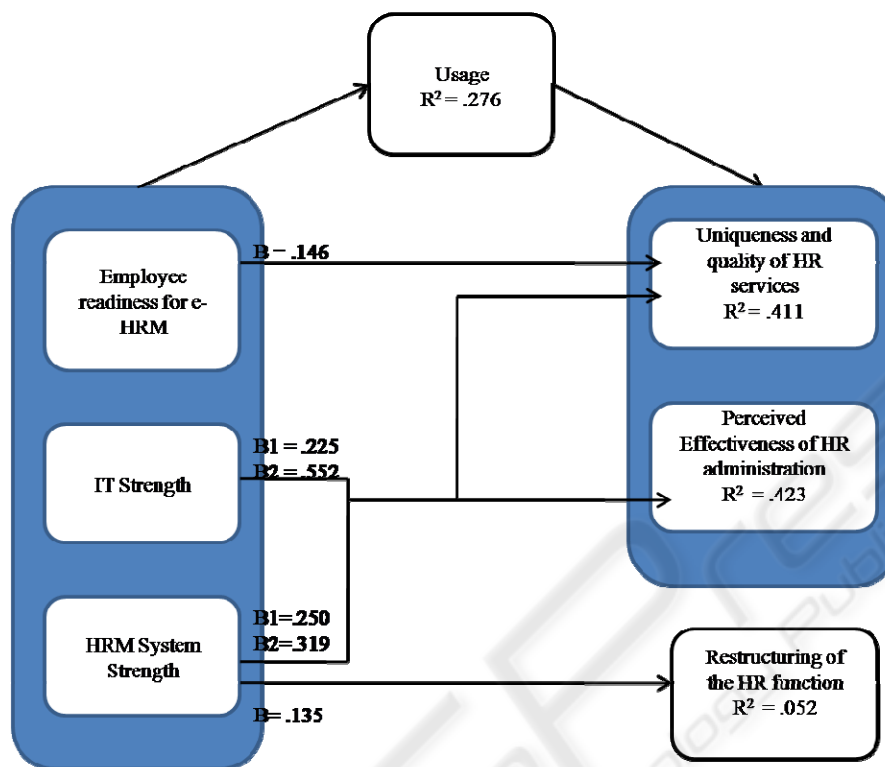
**Table 5.** Overview of propositions.

H1. Through the implementation of e-HRM HR professionals will improve their strategic orientation, spend less time on HR administration, and will diminish roles ambiguity	Rejected
H2. As a result of implementation of e-HRM, targeted organizational members will perceive their HRM services unique and of an increased quality	Rejected
H3. As a result of e-HRM implementation, administration of HR processes will be perceived as more effective.	Accepted
H 4. The usage of e-HRM will be determined by the technological strength consisting of usefulness, easiness of use, and data quality.	Accepted
H5. The usage of e-HRM will be determined by the strength of the HRM system in organizations.	Accepted
H 6. The usage of e-HRM will be determined by the employees readiness to work with e-HRM.	Accepted

## 5 HR roles

Some extra findings deserve special attention. For example, after and the exploratory factor analysis, it appeared that from the four HR roles [33], only two roles were clearly distinguished. Respondents didn't make a distinction between Employee Advocate and Human Capital Developer and again between Functional Expert and Strategic Partner/Change agent. Therefore these roles were merged into Employee oriented role and Business oriented role. There are several factors which can explain this. Employees were hesitant to make crucial evaluations about the HR function, and thereby HR roles. For some items, more than 50% answered "neutral". Probably, there is insufficient contact between the HR department and respondents to give an opinion about the HR department. Another explanation could be that employees are unwilling to criticize the HR department. Due to this preference of respondents to stay in the "middle", results could be less reliable. However, a distinction between two instead of four roles has still been made. Ulrich concluded in his survey of 1996, that HR roles were shifting towards a more strategic function [32]. Mohrman et al [21] support his findings. However, in this research HR professionals indicated they are spending more time on strategic activities than on administrative activities. Also, the Functional Expert and Strategic partner/Change agent role are seen as one role during factor analysis.

Our research thus does not support the finding that HR is becoming more strategic. One of the reasons could be that this survey has been executed in the Netherlands and the survey of Ulrich is executed globally. There could be a difference in functioning of HR between the Netherlands and other countries. The survey on which Ulrich based the four roles was executed among 256 HR executives. Our research is based on only 36 HR professionals and 107 other employees. The difference in perceptions between HR professionals and the other employees could also be a cause for the different results. The four roles of Ulrich are based on two dimensions: operational versus strategic and process versus people. [21] The two roles which are loaded on factor analysis can be described on the dimension of process versus people. Functional expert and Strategic partner/Change agent were both merged into the Business oriented role which can be placed at the process side of the axis. Human capital developer and Employee advocate were added together in the Employee oriented role. This role can be placed at the people side of the axis. HR professionals themselves want to make the HR function more strategic. However, right now, this change in focus cannot be discerned within companies. It could be that the HR department has just started performing more strategic activities and that this has not penetrated the rest of the organization. Based on the results of this research, currently two roles were used when evaluating the value creating effect of e-HRM.



**B1 = Beta for Uniqueness and quality of HR**  
**B2 = Beta for Perceived effectiveness of HR administration**

Fig. 1. Final model.

## 6 Conclusions

e-HRM has an impact on the organizations, but the implementation of e-HRM does not necessitate creating value. We did observe that e-HRM lead to a high Perceived effectiveness of HR administrative practices, but the uniqueness of and quality if of HRM services did not increase. Neither saw we that the implementation of e-HRM had an impact on the re-structuring of the HR function itself. At the same time we saw that the success enablers had influence on the Usage of the e-HRM application and the value creating factors. This means that the value creating factors could be influenced through the IT characteristics of the e-HRM application, the HRM system strength and the Employee readiness for e-HRM. IT and HRM system strengths and Employee readiness had a positive relation with Uniqueness of HRM and HR service qualities. Usage also had a positive influence on HRM effectiveness. The HR function itself was influenced by the HRM system strength and the Usage of the system. E-HRM had a positive effect on the Perceived effectiveness of HR administrative practices. The IT characteristics, HRM system strength and Usage of the e-HRM

application are, therefore, predictors of the Perceived effectiveness of HR administrative practices. Remarkable is that Employee participation during e-HRM implementation is only of minor influence.

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## References

1. Barki, H., Hartwick, J.: Measuring user participation, user involvement, and user attitude. *MIS Quarterly* March 1994 (1994).
2. Bowen, D.E., Ostroff, C.: Understanding HRM-firm performance linkages: the role of the “strength” of the HRM System. *Academy of Management Review* Vol. 29, No. 2, 203-221 (2004).
3. Bowen, D.E., Ostroff, C.: Moving HR to a higher level, HR practices and organizational effectiveness. In Klein, K.J., Kozlowski, S.W.J. (Eds.): *Multilevel theory, research, and methods in organizations: foundations, extensions and new directions*, 211-266, Jossey-Bas, San Francisco (2000).
4. Brockbank, W.: HR's Future on the Way to a Presence. *Human Resource Management*, 36(1), 65-70 (1997).
5. CedarCrestone 2006: *Workforce technologies and service delivery approaches survey*, Ninth annual edition (2006).
6. Davis, F.D.: Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly* September 1989 (1989).
7. Davis, F.D., Bagozzi, P., Warshaw, P.R.: User acceptance of computer technology: a comparison of two theoretical models. *Management Science* Vol. 35, No. 8 (1989).
8. Delmotte, J., De Winne, S., Gilbert, C., and Sels, L.: Comparing line managers' and trade union representatives' assessments of HRM system strength. Paper presented at the Dutch HRM Network Conference, 5-10 November, 2007, Tilburg, The Netherlands (2007).
9. Delone, W.H., McLean, E.R.: Information system success: the quest for the dependent variable. *Information system research* 3:1 (1992).
10. Försterling, F.: *Attribution: an introduction to theories, research and applications*. Psychology press, Hove (2001).
11. Haksever, C., Chaganti, R., Cook, R.G.: A model of value creation: strategic view. *Journal of Business Ethics* 49, 291-305 (2004).
12. Han, J., Chou, P., Chao, M., Wright, P.M.: The HR competencies-HR effectiveness link: a study in Taiwanese high-tech companies. *Human Resource Management* Vol. 45, No. 3, 391-406 (2006).
13. Hannon, H., Jelf, G., Branders, D.: Human resource information systems: operational issues and strategic considerations in a global environment. *The international Journal of Human Resource Management* 7 (1), 245-269 (1996).
14. Kovach, K.A., Cathcart, C.E.: Human Resource Information Systems (HRIS): providing business with rapid data access, information exchange and strategic advantage. *Public Personnel Management* Vol. 28, No. 2 (1999).

15. Lee, Y.W., Strong, D.M., Kahn, B.K., Wang, R.Y.: AIMQ: a methodology for information quality assessment. *Information&Management* 40, 133-146 (2002).
16. Lengnick-Hall, M.L., Moritz, S.: The impact of e-HR on the human resource management function. *Journal of Labor Research*, Vol. XXIV, No. 3 (2003).
17. Lepak, D.P., Snell, S.A.: Examining the human resource architecture: the relationship among human capital, employment, and human resource configurations. *Journal of Management* 28 (4), 517-543.
18. Lepak, D.P., Snell, S.A.: Virtual HR: strategic human resource management in the 21<sup>st</sup> century. *Human Resource Management Review*, 8 (3), 215-234 (1998).
19. Marler, J.H., Liand, X., Dulebohn, J.H.: Training and effective employee information technology use. *Journal of Management* Vol. 32, No. 5, 721-743 (2006).
20. Miller, V.D., Johnson, J.R., and Grau, J. Antecedents to willingness to participate in a planned organizational change. *Journal of applied communication research*, 22, 59 – 80 (1994).
21. Mohrman, S., and Tenkasi, R.: Total quality management: Practice and outcomes in the largest US firms, *Employee Relations*, 17 (3), 26 - 42 (1995).
22. Orlikowski, W.J.: Improvising Organizational Transformation Over Time: A Situated Change Perspective. *Information Systems Research* 7:1, 63-92 (1996).
23. Parasuraman, A., Zeithaml, V.A., Berry, L.L.: A conceptual model of service quality and its implications for future research. *Journal of Marketing* Vol. 49, 41-50 (1985).
24. Reddington, M., Hyde, C.: The impact of e-HR on line managers and employees in the UK: benefits, problems, and prospects. In: Martin, G., Reddington, M., Alexander, H. (Eds.), *Technology, Outsourcing and Transforming HR. Potentials, problems, and guidance for practitioners*, 35 – 59. Butterworth-Heinemann/Elsevier (2008).
25. Rizzo, J.R., House, R.J., Lirtzman, S.I.: Role conflict and ambiguity in complex organizations. *Administrative Science Quarterly* Vol. 15, 150-163 (1970).
26. Ruël, H.J.M., Bondarouk, T.V., Looise, J.C.: *E-HRM: innovation or irritation. An exploration of web-based Human Resource Management in large companies*. Lemma Publishers, Utrecht (2004).
27. Ruël, H.J.M.: *The non-technical side of office technology: managing the clarity of spirit and appropriation of office technology*. Twente University Press, Enschede (2001).
28. Stone, D.L., Stone-Romero, E.F., Lukaszewski, K.: Factors affecting the acceptance and effectiveness of electronic human resource systems. *Human Resource Management Review* 16, 229-244 (2006).
29. Stone, D.L., Stone-Romero, E.F., Lukaszewski, K.: The Functional and Disfunctional consequences of human resource information technology for organizations and their employees. *Advances in Human Performance and Cognitive Engineering Research*, Vol. 3, 37-68 (2003).
30. Strohmeier, S.: Research in e-HRM: Review and implications, *Human Resource Management Review*, 19-37 (2007).
31. Tansley, C., Watson, T.: Strategic exchange in the development of Human Resource Information Systems (HRIS). *New technology, Work and Employment* 15(2), 108-122 (2000).
32. Ulrich, D.: Human Resources: The next agenda for competitiveness. *Chemtech: the innovator's magazine*. 26, 911), 8-14 (1996).
33. Ulrich, D., Brockbank, W.: *The HR value proposition*. Harvard Business School Press Boston, Massachusetts (2005).
34. Venkatesh, V., Morris, M.G., Davis, G.B., Davis, F.D.: User acceptance of information technology: toward a unified view. *MIS Quarterly* Vol. 27, No. 3, 425-478 (2003).
35. Yeung, A., Brockbank, W.: Reengineering HR through information technology. *Human Resource planning* 18(2), 24-37 (1995).