

# Evaluating E-HRM success: A Validation of the Information Systems Success Model

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## Abstract

While a considerable amount of research has been conducted on information systems success models, little research has been carried out to address the conceptualization and measurement of e-HRM success within organizations. Whether or not traditional IS success models can be extended to assessing e-HRM success is rarely addressed.

This study provides the first empirical test of an adaptation of DeLone and McLean's IS success model in the context of e-HRM. The model consists of six dimensions: information quality, system quality, service quality, use, user satisfaction, and perceived net benefit. Structural equation modelling techniques is applied to data collected by questionnaire from 104 Human Resources (HR) managers and HR employees from a large Jordanian governmental ministry. The hypothesized relationships between the six success variables are significantly supported by the data. The findings provide several important implications for HR research and practice. This paper concludes by discussing the limitations of the study, which should be addressed in future research.

**Keywords:** E-HRM; information systems success model; perceived net benefit.

## 1. Introduction

Organisations have in recent years heavily invested in information and communication technology (ICT) for the support of different business functions. The human resources (HR) functions of organisations are no exception. The combination of the need to work more effectively and efficiently on the one hand and the possibilities of current ICT on the other, has resulted in the rapid development of electronic HR systems and applications (e-HRM) (Stone and Lukaszewski, 2009; Yusliza and Ramayah, 2012).

Although a variety of definitions exist for e-HRM, ranging from those based on system functionality to those that see it as an overall approach to HR management, for the purposes of this paper, e-HRM will be defined as the administrative support of the HR function in organizations by using information technologies, aiming at creating value within and across organisations of the targeted employees and management (Bondarouk & Ruël, 2009). Strohmeier (2007) defines e-HRM as the application of information technology for

networking and supporting at least two individual or collective actors in their shared performing of HRM activities. He notes that in e-HRM, technology serves both as a medium, connecting spatially segregated actors, and as a tool for task fulfilment, as it supports actors by substituting for them in executing HRM activities.

There is a fundamental difference between HRIS (human resource information system) and e-HRM lies in the fact that HRIS are directed towards the HR department itself (Gupta and Saxena, 2013). Users of these systems are mainly HR staff. These types of systems aims to improve the processes within the HR department itself (Alshibly, 2011). With e-HR, the target group is not the HR staff but people outside this department: the employees and management. HRM services are being offered through an intranet for use by employees. The difference between HRIS and e-HRM can be identified as the switch from the automation of HR services towards technological support of information on HR services. e-HR is the technical unlocking of HRIS for all employees of an organization (Ruël et al., 2004).

The literature on e-HRM suggests that, overall, the four goals in introducing e-HRM are reducing administrative costs, improving HR services, speeding response times, and improving decision making (Marler and Fisher, 2013), thus helping HRM to become more strategic, flexible, cost-efficient, and customer-oriented (Stone and Dulebohn, 2013). The e-HRM technology supports the HR activities to comply with the HR needs of the organisation through web-technology based channels. The e-HRM technology provides a portal which enables managers, employees and HR professionals to view extracts or other information which is necessary for managing the HR of the organization (Yusliza and Ramayah, 2012). Parry (2011) suggests that e-HRM and its self-service characteristics can be the cheapest and fastest way to provide specific HR activities. With e-HRM, managers can access relevant information and data, conduct analyses, make decisions and communicate with others and they can do this with a click of the mouse.

Academics and practitioners alike consider e-HRM applications to be a valuable tool. However, researchers have not demonstrated a consistent relationship between information systems (IS) investment and organizational performance (Heo and Han, 2003; Hitt and Brynjolffson, 1996). In order for e-HRM applications to be used effectively in an organization, we need dependable ways to measure the success and/or effectiveness of the e-HRM system. While a considerable amount of research has been conducted on IS success models (e.g., DeLone and McLean, 1992, 2003; Rai et al., 2002; Seddon, 1997), little research has been carried out to address the conceptualization and measurement of e-HRM success within organizations. Whether or not traditional IS success models can be extended to assessing e-HRM success is rarely addressed.

There is a need to investigate whether traditional information systems success models can be extended to investigating e-HRM. Hence, the main purpose of this study is to develop and validate a multidimensional e-HRM success model based on the DeLone and McLean (2003) IS success model. This paper is structured as follows. First, we review the development of IS success models. Second, based on prior studies, an e-HRM success model and a comprehensive set of hypotheses are proposed. Third, the methods, measures, and results of the study are presented. And, finally, theoretical and managerial implications and directions for future research are discussed. The validated e-HRM success model can serve as a

foundation for positioning and comparing e-HRM success research, and can provide HR managers with a useful framework for evaluating e-HRM success.

## **2. Theoretical foundation: information systems success**

E-HRM system is a special type of IS. Therefore, in this section we establish the theoretical foundation and conceptualization of an e-HRM success based on prior IS success studies.

In their attempt to structure the myriad of variables associated with the diversity of IS success, Delone and Mclean (1992) analysed, but did not empirically test, more than 100 empirical papers containing IS success measures between 1981 and 1988. Delone and Mclean argued that there was little relevance in calculating input variables like user participation or IT investment with respect to IS, if the dependent or output variable, IS success or IS effectiveness, could not be evaluated with similar accuracy. They argued that there were six major factors in IS success, namely: the quality characteristics of the IS itself (system quality), the quality of the output of the IS (information quality), consumption of the output of the IS (use), the IS user's response to the IS (user satisfaction), the effect of the IS on the behaviour of the user (individual impact) and the effect of the IS on organisational performance (organisational impact).

Delone and Mclean (1992) developed their model by considering information to be the output of an IS or the message in a communication system. They point out the serial nature of information that can be said to flow through the organisation. Drawing on work by Shannon and Weaver (1949) and Mason (1978), they noted that the effect of information on its recipient (user) can be measured at a technical level, a semantic level, or an effectiveness level. The technical level relates to how well a system transmits the symbols of communication, the semantic level concerns the explanation and interpretation of meaning by the receiver relative to the intended meaning of the sender, and the effectiveness level concerns how well the meaning delivered to the receiver affects his/her actual behaviour. Mason extended the Shannon and Weaver's model by labelling effectiveness as an influence, and represented the levels as a series of events that take place at the receiving end of an information system. According to Mason (1978), there are five stages to the process of communication: the production of information, the product itself, the recipient of information, the influence it has on the recipient, and the influence information has on the performance of the system. Mason explains that the effectiveness level includes the influence of the message on the recipient's (user's) behaviour. Thus, evaluation and application of information may effect a change in the user's behaviour (Rai et al, 2002).

In terms of Delone and Mclean's model, system quality related to the technical level, information quality related to the semantic level, and is use, user satisfaction, and individual impact related to the effectiveness-influence level. Delone and Mclean's model takes Shannon and Weaver's hierarchy of levels as the foundation for modelling system quality and information quality as drivers of is use and user satisfaction. Then Delone and Mclean applied Mason's arguments to model use and user satisfaction (response to use of its output) as antecedents of individual impact (effect of information on behaviour) and organisational impact. A core characteristic of the Delone and Mclean model is that user satisfaction is considered as an IS success variable, and is incorporated in their IS success model as an

antecedent of Individual Impact.

Delone and Mclean (1992) made many important contributions to our understanding of IS success. First, they provide a model for categorizing the multitude of IS success measures that have been used and reported in the prior literature, According to Grover et al, (1996), the exploration of IS success has been significantly shaped by Delone and Mclean's IS Success Model. Seddon et al (1999: 4) also say "Delone and Mclean's paper (model) is an important contribution to the literature on IS success measurement because it was the first study that tried to impose some order on IS researchers' choices of success measures ". Second, they suggest a model of temporal and causal interdependencies between the categories and amongst the constructs. Third, their approach begins to identify different organisational levels in the process of evaluation (Grover et al, 1996; Seddon, 1997).

The relationships proposed by Delone and McLean have been tested in several domains. Since its publication, about 300 articles in refereed journals have made use of this IS success model (Delone and Mclean, 2003). Roldán and Leal (2003) tested the entire model for executive IS and found support for some of the relationships. Rai et al. (2002), in a study to assess the validity of Delone and Mclean's model, found that IS user satisfaction impacts IS use: a higher level of satisfaction generates better user dependence on the system.

While several empirical studies explicitly tested the relationships among the variables identified in the original Delone and McLean model, other researchers have criticized Delone and Mclean's model and suggest that there are major gaps in the model (Seddon, 1997; Garrity and Sanders, 1998; Ballantine et al, 1996). Some of the strongest criticism focused on the lack of service quality among its variables. Accordingly, in response to a call from other researchers who tested and discussed the original model, and due to the advent and growth of Internet-based applications, DeLone and McLean decided to add service quality of their new model as an important dimension of IS success, noting "especially in the e-Commerce environment where customer service is crucial" (DeLone and McLean, 2003:27).

Therefore, in an attempt to contribute to a universal model, DeLone and McLean (2003) introduced an updated model 10 years after its introduction. Additionally, in an effort to make the updated model more parsimonious, the authors combined individual impact and organisational impact to form net benefits. Thus, the DeLone and McLean IS success (D&M) model (2003) was approved as a valid comprehensive model for measuring success in the IS realm. The authors outlined that the addition of service quality and the collapsing of individual impacts and organisational impact on net benefits did not change the nature of the original model; instead, it made it a stronger model considering the rapid improvement in Internet-based applications. Furthermore, after realising the importance of electronic service in the IS context, DeLone and McLean (2003) outlined that the frequent use of the system not only indicates more benefits to the users, but also the quality of the system should be considered as well. The authors outline that the new variable, service quality, which was added to the update model, is considered the most important success measure. Nevertheless, it cannot be analysed and understood without including system and information measurements (DeLone and McLean, 2004). As a result, the updated model includes six success dimensions, and maintains that the constructs of information quality, system quality and service quality individually and jointly affect the factors of use and user-satisfaction;

whereas user-satisfaction and use jointly affect net benefit. Figure 1 illustrates the updated D&M IS Success model (2003).

Petter et al. (2008) provide a review of recent literature on measuring IS success. They summarize the measures applied and examine the relationships that comprise the D&M IS success model in an individual and organizational context. In another review, Urbach & Müller (2011) explore the current state of IS success research by analysing and classifying recent empirical articles with regard to their theoretical foundation, research approach, and research design. The results show that the dominant research analyzes the impact that a specific type of IS has by means of users' evaluations obtained from surveys and structural equation modelling. The D&M IS success model is the main theoretical basis of the reviewed studies. Several success models for evaluating specific types of IS – like employee portal (Urbach et al., 2010) or electronic government (Wang and Liao, 2008) – have been developed from this theory.

### **3. Research model and hypotheses**

Within the e-HRM context, HR staff use the systems to conduct HR functions, making the e-HRM a communication and IS phenomenon that lends itself to the updated D&M IS success model. DeLone and McLean (2003) contend that the Internet applications process fits well into their updated IS success model and the six success dimensions, and encourage others to continue testing and challenging their model. DeLone and McLean's (2003) updated IS success model can be adapted to the measurement challenges of a new e-HRM context. Accordingly, this study proposes a comprehensive model of e-HRM success (see Fig. 1), which suggests that information quality, system quality, service quality, use, user satisfaction, and perceived net benefit are success variables in e-HRM.

We studied the definitions of the D&M IS success model's success dimensions, contrasted them with e-HRM specific properties, and merged the different points of view into a revised classification scheme. Consequently, we included the following success dimensions in our theoretical model:

Information quality, which focuses on the quality of an e-HRM system output (i.e. The quality of the information that the e-HRM provides) and its usefulness for the user. Information quality has been shown to be an important success factor when investigating overall IS success, especially in the context of web-based systems (McKinney et al., 2002).

System quality, which consists of measures of an e-HRM as a system in itself. It considers performance characteristics, functionality, and usability, among others (McKinney et al., 2002). Accordingly, system quality can be regarded as the degree to which the system is easy to use to accomplish tasks (Schaupp et al., 2006).

Service quality, which includes measures of the overall support related to e-HRM and delivered by the service provider. In this context, the success dimension covers aspects such as responsiveness, reliability, empathy, and competence of the responsible service personnel (Pitt et al., 1995).

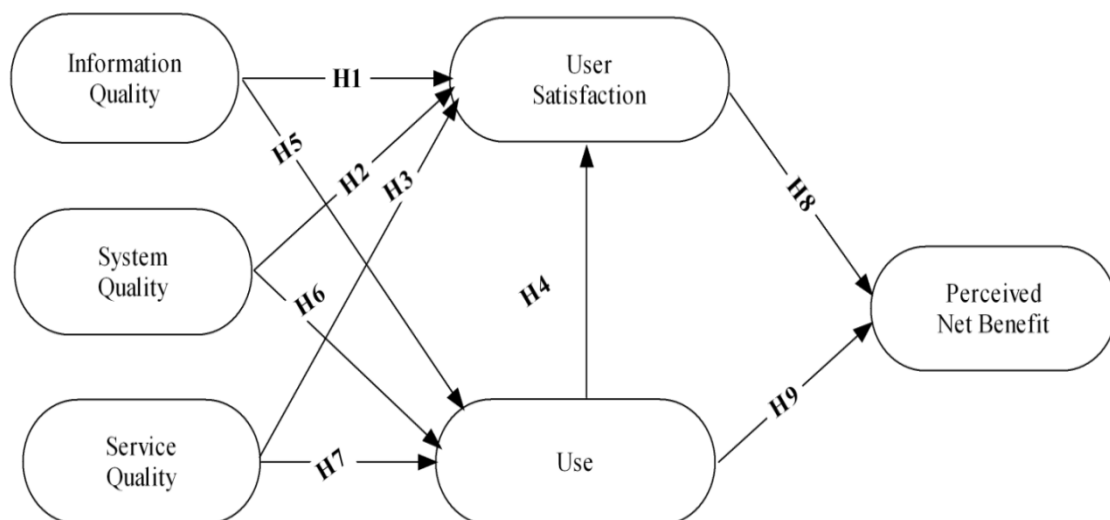
User satisfaction, which is the affective attitude to an e-HRM of an employee who interacts directly with it (Doll and Torkzadeh, 1988). User satisfaction is considered one of the most important measures when investigating overall IS success. Use, which measures the perceived

actual use of an e-HRM by the ministry's HR staff.

The e-HRM perceived net benefit defined as an achievement of a firm's objectives for using the e-HRM and achievement of end-user related objectives from using them. These covers actual benefits adopters receive from using the e-HRM and include a myriad of benefits covers the impacts of e-HRM, which subsumes measures of the perceived individual and organizational benefits that employees gain through the use the e-HRM. These benefits cover aspects like task performance, job efficiency, quality improvement, and cost reduction.

DeLone and McLean (2003) suggest different players or stakeholders may have different opinions as to what constitutes a benefit to them. Researchers need to clearly and carefully define the stakeholders and the context in which IS success or net benefits are to be measured (DeLone & McLean, 2003) Thus, this study focuses mainly on the perspective of the employee, and uses the six updated IS success dimensions: information quality, system quality, service quality, system use, user satisfaction, and perceived net benefit.

**Figure 1: The research model**



The hypothesized relationship between e-HRM system success variables are based on the theoretical and empirical work reported by DeLone and McLean (2003). As they suggest, the success model needs further development and validation before it could serve as a basis for the selection of appropriate IS measures. Accordingly, the study Hypothesized the following nine hypotheses tested:

- H1. Information quality will positively impact user satisfaction.
- H2. System quality will positively impact user satisfaction.
- H3. Service quality will positively impact user satisfaction.
- H4. Use will positively impact user satisfaction.
- H5. Information quality will positively impact use.
- H6. System quality will positively impact use.
- H7. Service quality will positively impact use.
- H8. User satisfaction will positively impact perceived net benefit.
- H9. Use will positively impact perceived net benefit.

## 4. Research methodology

### 4.1. Construct measurement

To ensure the content validity of the scales, measurement scales for the quantitative data collection were mainly elicited from previously verified instruments. The information quality construct was measured by a seven -item scale from Bailey and Person (1983), with modifications to fit the specific context of e-HRM, Bailey and Pearson's instrument is widely accepted, has been tested for reliability and validity by several researchers, and has become a standard instrument in the IS field. A four -item scale was adopted and refined from instruments used by Alshibly (2011) were used to measure the system quality construct.

Service quality construct was measured using a five-item scale was adopted and refined from instruments used by Chang et al (2009). Use was measured by a four-item measure adapted from previous studies (Balaban et al., 2013; Rai et al., 2002).

In this research, we consider satisfaction as an evaluative judgment regarding a specific e-HRM experience and the affective attitude to the e-HRM of the employee who interacts directly with the e-HRM (Doll and Torkzadeh, 1988). This construct was measured with a four-item scale from Seddon and Yip (1992). The e-HRM perceived benefits defined as an achievement of a firm's objectives for using the e-HRM and achievement of end-user related objectives from using them. These covers actual benefits adopters receive from using the e-HRM and include a myriad of benefits covers the impacts of e-HRM. This was operationalized by a six-item scale adopted from (Alshibly, 2011; Tansley et al, 2001) and some e-HRM experts' advice. All the items were measured using a 5- point Likert Scale with anchors ranging from strongly agree (5) to strongly disagree (1).

After the measurement variables were developed, the face validity of these variables was tested. Two IS scholars and two management scholar reviewed the measurement variables. In addition, 5 IS graduate students reviewed the measurement variables and provided feedback on the length and clarity of each item. Based on the feedback the researchers received from the reviewers, any questions that caused confusion or where deemed potentially difficult to understand were dropped or replaced by new understandable items. Table 1 presents the research constructs and related survey items used for measurement of each of these constructs.

Table 1. Measurement items for questionnaire.

Construct	Survey questions	Source
Information quality	IQ1: The e-HRM system provides information that is exactly what you need IQ2: The e-HRM system provides information you need at the right time IQ3: The e-HRM system provide information that is relevant to your job IQ4: The e-HRM system provides sufficient information IQ5: The e-HRM system provides information that is easy to understand IQ6: The e-HRM system provides up-to-date Information IQ7: The e-HRM system provides sufficient information	Bailey and Person (1983)
System quality	SQ1: The e-HRM system is easy to use. SQ2: The e-HRM system is user-friendly. SQ3: The e-HRM system provides high-speed information access. SQ4: The e-HRM system provides interactive features between users and system.	Alshibly,(2011)
Service quality	SV1: When users have a problem, The e-HRM shows a sincere interest in solving it. SV2: The e-HRM insists on error-free records. SV3: The e-HRM tells users exactly when services will be performed. SV4: You feel safe in your transactions with the e-HRM. SV5: The e-HRM gives users individual attention.	Chang et al., (2009)
User satisfaction	US1: Most of the users bring a positive attitude or evaluation towards the e-HRM system function. US2: You think that the perceived utility about the e-HRM system is high. US3: The e-HRM has met your expectations. US4: You are satisfied with the e-HRM system.	Seddon and Yip (1992)
Use	U1: The frequency of use with the e-HRM system is high. U2: You depend upon the e-HRM system. U3: I was able to complete a task using the e-HRM even if there was no one around to tell me what to do as I go. U4: I have the knowledge necessary to use the e-HRM.	Balaban et al., (2013) Rai et al., (2002).
Perceived net benefits	NB1: The e-HRM system helps you improve your job performance. NB2: The e-HRM system helps the organization save cost. NB3: The e-HRM system helps the organization achieve its goal. NB4: Using The e-HRM improves the assessment and training	Alshibly,(2011); Tansley et al, (2001)



Construct	Survey questions	Source
	needs NB5: Using The e-HRM in job increases my productivity. NB6: Overall, using the e-HRM enhances recruitment and performance management.	

#### 4.2. Sampling and data collection

The data for this study were collected from a sample of Human Resource (HR) managers and HR employees from a large Jordanian governmental ministry. The method of the research sampling is “purposive sampling” which gives the researchers to use their own judgment to select suitable people for the sample.

Out of the 150 questionnaires distributed to HR employees, 104 usable questionnaires were returned, yielding a response rate of 69.3 percent, which is considered acceptable.

The the respondents' characteristics is presented in Table 2. Male participants represented a slightly higher percentage of the completed sample (approximately 64%) compared to female participants (approximately 36%). 37% of the participants were aged 25-35 years. The completed sample was composed of well-educated individuals, approximately 69% of whom were postgraduate students. The participants were mostly experienced HR, Approximately 45% of the participants had more than 15 years' work experience in using computers.

Table 2. Characteristics of the respondents

Characteristics	Number	Percentage
<b>Gender</b>		
Male	67	64.4
Female	37	35.6
<b>Age</b>		
Less Than 25	3	2.9
From 25 to 35	38	36.5
Over 35 to 45	33	31.7
Over 45 to 55	29	27.9
Older than 55	1	1.0
<b>Education</b>		
High School and less	11	10.6
Diploma	3	2.9
B.A	72	69.2
Master	18	17.3
<b>Work Experience</b>		
Less than 5	25	24.0
From 5 to 10	25	24.0
Over 10 to 15	7	6.7
More than 15	47	45.2

## 5. Research results

To assess the model, we used SmartPLS M3 2.0 (Ringle et al., 2005) to estimate the parameters in the outer and inner model. PLS tries to maximize the variance explained of the dependent variables. It offers many benefits with respect to distribution requirements, type of variables, sample size and the complexity of the model to be tested. We applied PLS path modelling with a path-weighting scheme for the inside approximation (Chin, 2010; Wong, 2013). Then, we applied the non parametric bootstrapping approximation (Hair et al., 2013) with 200 resampling to obtain the standard errors of the estimates.

### 5.1. Assessment of the measurement model

First, we tested the convergent validity, which is the degree to which multiple items measuring the same concept are in agreement. As suggested by Hair et al. (2013) we used the factor loadings, composite reliability and the average variance extracted (AVE) to assess convergent validity. The loadings for all items exceeded the recommended value of 0.5 (Hair et al., 2013). Composite reliability values (see Table 3), which depict the degree to which the construct indicators indicate the latent construct ranged from 0.85 to 0.95 which exceeded the recommended value of 0.7 (Hair et al., 2013). The average variance extracted, which reflects the overall amount of variance in the indicators accounted for by the latent construct, were in the range of 0.69 and 0.80 which exceeded the recommended value of 0.5 (Hair et al., 2013).

Table 3. Reliability, the average variance extracted, and discriminant validity

Factor/reliability	Information quality (IQ)	System quality (SQ)	Service quality (SVQ)	User satisfaction (US)	Use (U)	Perceived net benefit (NB)	AVE (< 0.5)
<b>IQ</b>	<b>0.84</b>						0.71
<b>SQ</b>	0.71	<b>0.83</b>					0.69
<b>SV</b>	0.51	0.39	<b>0.85</b>				0.72
<b>US</b>	0.74	0.70	0.51	<b>0.89</b>			0.79
<b>U</b>	0.59	0.56	0.56	0.56	<b>0.83</b>		0.69
<b>NB</b>	0.50	0.35	0.64	0.46	0.70	<b>0.89</b>	0.80
<b>Note: The bold elements on the diagonal represent the square roots of the average variance extracted, and off-diagonal elements are the correlation estimates.</b>							
<b>Composite reliability (&lt; 0.7)</b>	0.95	0.90	0.93	0.94	0.90	0.96	
<b>Cronbachs Alpha (&lt; 0.7)</b>	0.93	0.85	0.90	0.91	0.85	0.95	

### 5.2 Discriminant validity of constructs

Next we proceeded to test the discriminant validity. Discriminant validity is the extent to which the measures is not a reflection of some other variables and is indicated by the low correlations between the measure of interest and the measures of other constructs (Wetzels et al., 2009). Discriminant validity can be examined by comparing the squared correlations between constructs and the average variance extracted for a construct (Fornell and Larcker,

1981). As shown in Table 3, the squared correlations for each construct is less than the average variance extracted by the indicators measuring that construct indicating adequate discriminant validity.

Another approach to assessing discriminant validity involves examining the cross-loadings. Discriminant validity is established when an indicator's loading on a construct is higher than all of its cross loadings with other constructs. Table 4 shows that the study constructs indicator's loadings are higher than all of its cross loadings. Thus, discriminant validity has been established. In total, the measurement model demonstrated adequate convergent validity and discriminant validity.

Table 4. The loadings and cross loadings for the construct indicators

Construct	Items	Information quality	System quality	Service quality	Satisfaction	Use	Perceived net benefit
Information quality	IQ1	0.88	0.61	0.50	0.61	0.51	0.48
	IQ2	0.85	0.56	0.41	0.62	0.39	0.35
	IQ3	0.85	0.62	0.39	0.62	0.49	0.40
	IQ4	0.86	0.62	0.41	0.62	0.55	0.47
	IQ5	0.87	0.59	0.51	0.60	0.53	0.47
	IQ6	0.76	0.61	0.40	0.57	0.49	0.39
	IQ7	0.85	0.63	0.40	0.65	0.49	0.35
System quality	SQ1	0.61	0.77	0.44	0.54	0.40	0.36
	SQ2	0.52	0.84	0.26	0.50	0.41	0.33
	SQ3	0.59	0.86	0.34	0.66	0.41	0.23
	SQ4	0.65	0.86	0.27	0.62	0.43	0.29
Service quality	SV1	0.52	0.44	0.83	0.58	0.50	0.57
	SV2	0.45	0.34	0.84	0.41	0.48	0.51
	SV3	0.31	0.20	0.81	0.29	0.41	0.50
	SV4	0.39	0.28	0.90	0.40	0.51	0.54
	SV5	0.46	0.36	0.86	0.44	0.45	0.59
Satisfaction	US1	0.68	0.66	0.48	0.91	0.53	0.42
	US2	0.64	0.61	0.45	0.91	0.49	0.42
	US3	0.59	0.53	0.46	0.82	0.51	0.38
	US4	0.70	0.68	0.42	0.90	0.46	0.41
Use	U1	0.55	0.41	0.44	0.49	0.86	0.61
	U2	0.43	0.48	0.48	0.48	0.79	0.57
	U3	0.30	0.29	0.41	0.34	0.80	0.59
	U4	0.62	0.44	0.51	0.53	0.86	0.55
Perceived net Benefit	NB1	0.48	0.42	0.53	0.49	0.66	0.86
	NB2	0.51	0.33	0.59	0.41	0.64	0.86
	NB3	0.40	0.29	0.55	0.36	0.63	0.92
	NB4	0.35	0.25	0.56	0.36	0.63	0.93
	NB5	0.39	0.28	0.57	0.39	0.62	0.94
	NB6	0.53	0.35	0.63	0.45	0.55	0.85

### 5.3 Assessment of the structural model

We then evaluated the structural model to test the hypotheses. Two measures were used to assess the structural model: the statistical significance (t-tests) of the estimated path coefficients, and the ability of the model to explain the variance in the dependent variables R square ( $R^2$ ).  $R^2$  results represent the amount of variance in the construct in question that is explained by the model (Chin, 2010).  $R^2$  attempts to measure the explained variance of the dependent variable relative to its total variance. Values of approximately 0.35 are considered substantial, values around 0.333 moderate, and values of approximately 0.190 weak (Martinez-Ruiz and Aluja- Banet, 2009). To test the significance of the hypotheses, the rule proposed by Martinez-Ruiz and Aluja- Banet (2009) was followed. The t-value  $>1.65$  is significant at the 0.05 level, and the t-value  $> 2$  is significant at the 0.01 level. As shown in Figure 2 and Table 5, the ten hypotheses were supported.

Information quality ( $\beta = 0.37$ ,  $P < 0.001$ ), system quality ( $\beta = 0.33$ ,  $P < 0.001$ ), service quality ( $\beta = 0.13$ ,  $P < 0.001$ ), and Use ( $\beta = 0.10$ ,  $P < 0.001$ ) were all had a significant impact on user satisfaction. Thus H1, H2, H3 and H4 were supported. In addition, Information quality ( $\beta = 0.32$ ,  $P < 0.001$ ), system quality ( $\beta = 0.13$ ,  $P < 0.001$ ), and service quality ( $\beta = 0.35$ ,  $P < 0.001$ ) were all had a significant impact on Use. Thus H5, H6, and H7 were supported. Finally, both user satisfaction and use had a significant influence on perceived net benefit. H8 and H9 were supported ( $\beta=0.10$ ,  $P < 0.001$  and  $\beta=0.64$ ,  $P < 0.001$ , respectively).

Table 5. Standardized coefficients ( $\beta$ ),  $R^2$ , and t-statistic

Hypotheses	Path	$\beta$	$R^2$	T Statistics	Decision
H1	Information quality -> satisfaction	0.37	0.63	6.6878	Supported
H2	System quality -> satisfaction	0.33		5.8963	Supported
H3	Service quality -> satisfaction	0.13		2.6363	Supported
H4	USE -> satisfaction	0.10		2.239	Supported
H5	Information quality -> USE	0.32	0.45	4.5711	Supported
H6	Systems' quality -> USE	0.13		2.2404	Supported
H7	Service quality -> USE	0.35		8.2021	Supported
H8	Satisfaction -> perceived NetBenefit	0.10	0.49	2.0227	Supported
H9	USE -> perceived NetBenefit	0.64		13.3553	Supported

\*\*\*  $p < .001$ , \*\*  $p < .05$ , \*  $p < .01$ , based on two-tailed test;  $t(p < 1\%) = 2.58$ ;  $t(p < 5\%) = 1.96$ ;  $t(p < 10\%) = 1.65$

Altogether, this model accounted for 49% of the variance in perceived net benefit, with use exerting a stronger direct effect than user satisfaction on perceived net benefit. 63 percent of the variance in user satisfaction was explained by information quality, system quality, service quality, and use, while 45% of the variance in use was explained by information quality, system quality, and service quality.

Total effect's output produced by SmartPLS (Table 6) shows the direct and total effect of user

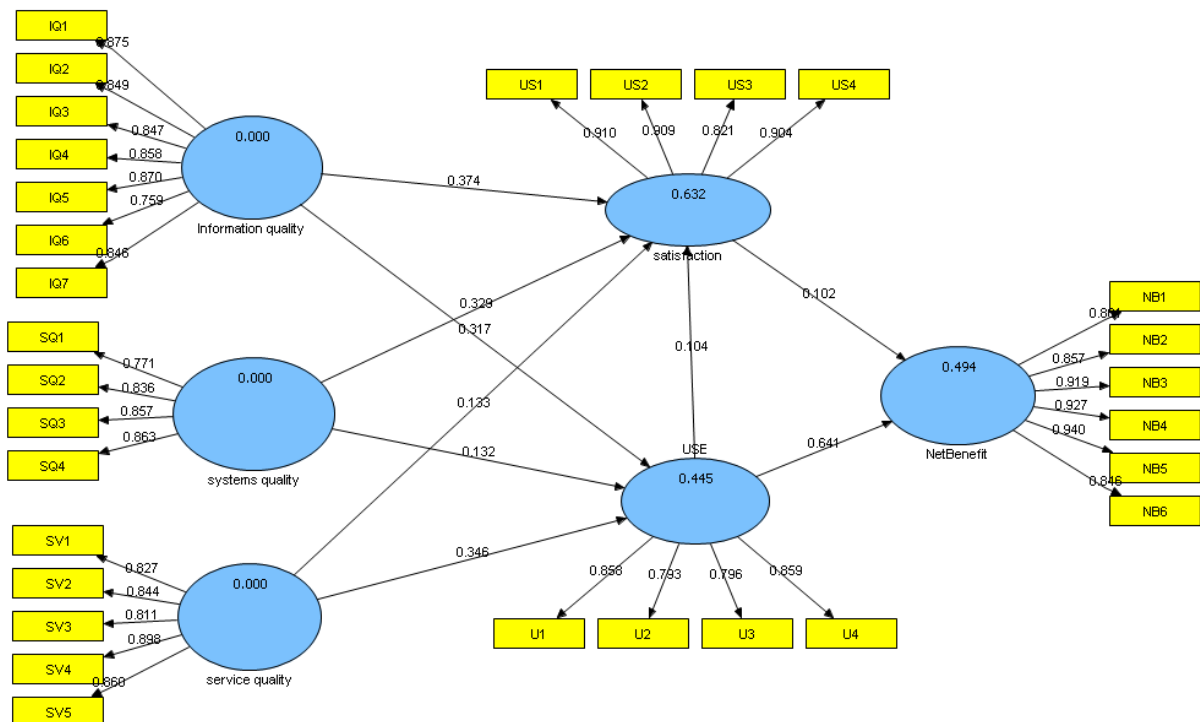
satisfaction on perceived net benefit was 0.10. However, the direct and total effects of use on perceived net benefit were 0.6 and 0.65, respectively. Thus, use exhibited stronger direct and total effects on perceived net benefit than user satisfaction.

Table 6. The direct and total effect

	Direct effect			Total effect		
	Satisfaction	Use	Perceived NetBenefit	Satisfaction	Use	Perceived Net Benefit
Information quality	0.37	0.32		0.41	0.32	0.24
System quality	0.33	0.13		0.34	0.13	0.12
Service quality	0.13	0.35		0.17	0.35	0.24
Use	0.10		0.64	0.10		0.65
Satisfaction			0.10			0.10

Among the three quality-related constructs, both information quality and service quality had the strongest total effect on perceived net benefit. The direct and total effects of information quality, system quality, service quality, use, and user satisfaction on perceived net benefit are summarized in Fig. 2 shows the standardized path coefficients as well as variance explained.

Figure 2: PLS path analysis model



## 6. Discussion and implications, limitations, and future research

This research has addressed the concern for of measuring the success of e-HRM. For this purpose, an e-HRM success measurement model was developed based on the DeLone and McLean (2003) updated IS success model, which captures the multidimensional nature of e- HRM success. The results show that information quality, system quality, service quality, use, user satisfaction, and perceived net benefit are valid measures of e-HRM success. The hypothesized relationships between the six success variables were significantly supported.

This research provides several important implications for e-HRM success research and management. According to the proposed model, perceived net benefit is considered to be a closer measure of e-HRM success than the other five success measures. Perceived net benefit should develop if the formation of perceived quality, system use, and user satisfaction is appropriately managed. Thus, management attention might more fruitfully focus on the development of these psychological and behavioural processes.

In order to increase user perceived net benefit, organizations need to develop e-HRM with better information quality, system quality, and service quality, which, in turn, will influence user system usage behaviour and satisfaction evaluation, and the corresponding perceived net benefit. In this model, system use was found to have the strongest direct and total effect on perceived net benefit, indicating the importance of system use in promoting HR staffs perceived net benefit. Simply saying that increased use will yield more benefits, without considering the nature of this use, is insufficient (DeLone & McLean, 2003), as system use is a necessary condition of yielding benefits to HR staffs.

The findings clearly indicate that the total effects of information quality on use, user satisfaction, and perceived net benefit are substantially greater than those of system quality and service quality. That is, in the context of e-HRM, beliefs about information quality have a more dominant influence on use, user satisfaction, and perceived net benefit than beliefs about system quality and service quality. Thus, respondents showed more concern about information quality (e.g., usefulness, understandability, completeness, and timeliness) This means that organizations should pay much more attention to promoting the information quality of e-HRM.

With the advent and development of e-HRM research, measuring multiple e-HRM success variables continues to be important. This model provides a rich portrayal of the dynamics surrounding quality measures, satisfaction evaluation, usage, and user-perceived net benefits. The results show that HR staffs perceive the benefit of an e-HRM system because they have used it and felt satisfied with its information, system quality, and service quality. While system usage and user satisfaction are commonly acknowledged as useful proxy measures of system success (Bailey & Pearson 1983; Doll & Torkzadeh, 1988, 1998; Ives et al., 1983), this study suggests that user-perceived net benefit can be considered as the variable closer in meaning to success than system usage and user satisfaction. This research also confirms that the use, user satisfaction, and perceived net benefit are complementary yet distinct constructs, and that use is partially mediated through user satisfaction in its influence on the perceived net benefit of an e-HRM system.

From a practical point of view, our model offers a means for organizations to evaluate and predict the success of e-HRM. e-HRM success, like the success of any other IS, is

multidimensional and interdependent in nature. Owing to our results, practitioners now know more about the levers that help to improve their e-HRM and can prioritize their investments accordingly.

This research contribution to the theory is the extension and further empirical testing of the D&M IS Success Model in a different setting and system context than in previous studies as recommended by various authors (e.g., DeLone and McLean, 2003; Iivari, 2005). Consequently, this study is among the first to empirically validate a comprehensive success model for e-HRM. Thus, our study advances the theoretical development in the area of such systems, serving as a basis for future research in this field. Moreover, by using an established IS theory as the theoretical basis for a benchmarking study, our study is an attempt to apply rigorous research to a practical, highly relevant problem.

Our research has a few limitations, this research is limited in that we used a purposive sampling of a single ministry for the data collection. A random sample from a pool of companies would have increased the generalizability of the results. With regard to inviting employees to participate in the survey, the participating ministry was instructed to choose a sample that was as representative of the HR staff as possible. However, by leaving the survey distribution to the ministry, we had very little control over the sampling process. Despite these limitations, the present study provides valuable insights into the study of e-HRM success.

In brief, this study provided a structure for understanding e-HRM success and explored the impact of both e-HRM quality on HRIS satisfaction, e-HRM use and perceived net benefit. The detailed framework framework we built from theory and empirical research provides a foundation for future research.

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