Australian Journal of Basic and Applied Sciences, 5(5): 157-169, 2011
ISSN 1991-8178

Human Resources Information Systems success Assessment: An integrative model

Haitham Al Shibly

Department of business administration, Al Balqa Applied University, As_salt, Jordan.

Abstract: This research was in response to the call for continuous challenge and test of Human Resources Information Systems (HRIS) success models, Based on the previous IS success models, this study presented and validated a comprehensive, multidimensional model of HRIS success, which consists of six success measures: perceived HRIS system quality, perceived HRIS information quality, perceived HRIS ease of use, perceived HRIS usefulness, HRIS satisfaction, HRIS success (net benefit). The empirical evidence HRIS success was affected by HRIS satisfaction, which, in turn, was influenced by perceived HRIS system quality, perceived HRIS information quality, perceived HRIS ease of use, and perceived HRIS usefulness

Key words: Human Resources Information Systems, TAM, HRIS success, Delone and Mclean success model.

INTRODUCTION

Increasing demands placed on human resources (HR) by co-workers as well as internal and external forces are rendering manual HR management completely adequate (Beckers and Bsat, 2002). Given such trends, information systems (IS) has considerable potential as a tool that managers can use, both generally and in human resourcing functions in particular to increase the capabilities of the organization (Tansley and Watson, 2000). Those managing the HR functions have not ignored such advice and a widespread use of human resource information systems (HRIS) has occurred (Ngai and Wat, 2006). Yet few organizations systematically attempt to measure the effectiveness of their IS, or even know how to do so (DeLone and McLean, 2003; Ngai and Wat, 2006). Consequently, HR mangers as well as IS researchers are stressing the need to better understand the factors that contribute to the success or otherwise of HRIS (Ngai and Wat, 2006; Hussain *et al*, 2007).

Demand for useful measures for assessing the overall benefits of IS investments has long been acknowledged (Myers *et al*, 1997; DeLone and McLean, 1992). However, there is no accepted or over all framework that arrange the important aspects of effective HRIS in a way helping to assist HRIS success, the single available options is by looking through the lens of well-known theories and models of IS success, by which the success of HRIS can be usefully assessed.

This study thus reviews the extant literature related to the HRIS success. The study, then, develop and validate a multidimensional HRIS systems success model based on the IS success theories: the technology acceptance model (TAM) (Davis, 1989), User satisfaction and DeLone and McLean information systems success model (DeLone and McLean, 1992, 2003).

The study argues that using user satisfaction as surrogate indicator for measuring the success of HRIS has some theoretical difficulties, in similar vein, using TAM alone may not be sufficient to adequately capture the full meaning of effectiveness or the success of HRIS; this study posits that HRIS success is a joint function of system and information characteristics and acceptance. By integrating these two powerful theories, this study suggests that the technology acceptance literature and the parallel user satisfaction stream are not competing approaches to understanding IT usage and value. That is, user satisfaction and TAM represent complementary steps in a causal chain from key characteristics of system design, to beliefs and expectations about outcomes that ultimately determine usage. The key consequents of HRIS success are user-related, recognising the employee's important role in determining the success of business endeavours.

2-The Concept, Nature and Use of an HRIS:

An HRIS is integrated system used to gather, store and analyze information regarding an organization's human resources" comprising of databases, computer applications and hardware and software necessary to collect/record, store, manage, deliver, present and manipulate data for human resources function (Hendrickson, 2003).

Corresponding Author: Haitham Al Shibly, Department of business administration, Al Balqa Applied University, As_salt, Jordan.

HRIS can support long range planning with information for labor force planning and supply and demand forecasts; staffing with information on equal employment, separations and applicant qualifications; and development with information on training program costs and trainee work performance. It can also support compensation programs, salary forecasts, pay budgets and labor/employee relations with information on contract negotiations and employee assistance needs (DeSanctis, 1986; Kovach *et al*., 2002)

HR requests might include such items as updated vacation and sick leave reports, performance review reports, salary histories, probation reports, expense reports, education and immigration status verifications, employee background checks, employee benefits summation, updated organizational charts and employee telephone numbers, payroll processing, tax and other government regulations relating to HR (Beckers and Bsat, 2002). All these types of inquiries need to be addressed by HRIS. Further according to Bsat and Beckers (2006) a HRIS consists of three components input, data maintenance and output. The input component focuses on entering HR data into the system.

The cost of an HRIS can be high and therefore it is important that the benefits derived from the implementation of an HRIS must be accessed (Bsat and Beckers, 2006). Still number of firms investing in HRIS has dramatically increased in recent years (Ball, 2001). Bsat and Beckers (2006) further argued that if the system can provide an organization with a competitive advantage by improving the HR-decision making process, this would have enormous implications on productivity, cost reductions, product quality.

Hagood and Friedman (2002) observed that HRIS implementation success has emerged as a significant challenge for organizations attempting to justify planned investments or recover expenses associated with investments already incurred. This is further supported by Shrivatsava and Shaw (2003) that despite evidence of increasing use of HR related technology by individual firms, there has been little theory development in this area

3-The Theoretical Foundations of HRIS Success Model:

In our review of the IS success literature, we found no study specifically aimed at comprehensively examining the success of HRIS. Consequently, in developing our theoretical model, We drew inspiration from three significant streams of IS success: (a) the technology acceptance model (TAM) (Davis, 1989), (b) User satisfaction and (c) DeLone and McLean information systems success model (DeLone and McLean, 1992, 2003), to explain the success of HRIS. The relevance of applying traditional IS models such as TAM and user satisfaction in studying the success of HRIS can be also ascertained from recent research papers which has started to draw attention that research in the IS success is fragmented and criticized for lack of theoretical grounding (Avgerou, 2000, Larsen, 2003).

(a) Technology Acceptance Model:

The first theoretical base of this study is Davis (1989) Technology Acceptance Model (TAM), TAM is widely applied to investigate user acceptance of technology. Davis (1989) claimed that, all else being equal, an application that the end-user perceives as being easier to use than another is more likely to be accepted. According to TAM, perceived usefulness and perceived ease of use, both influence one's attitude toward system usage, which influences one's behavioral intention to use a system, which, in turn, determines actual system usage.

Originally, Davis (1989) found a weak link between perceived usefulness and attitude, but a strong link between perceived usefulness and behavioral intention, therefore dropped attitude from the final model. The revised model of TAM has two versions: pre and post implementation. Davis (1989) expressed that in both the phases of implementations, individuals would depend more on perceived usefulness and perceived ease of use to form intentions which predicts acceptance behavior

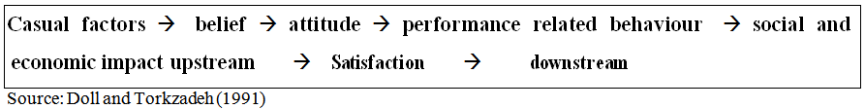
In fact, TAM has proven to be among the most effective models in the IS literature for predicting user acceptance and usage behavior. Yet, few of TAM studies have investigated the impact of system characteristics as antecedents to ease of use or perceived usefulness (Wixom and Todd, 2005). In their integration of the technology acceptance literature, Venkatesh *et al*. (2003) stress the need to extend this literature by explicitly considering system and information characteristics and the way in which they might influence the core beliefs in TAM and might indirectly shape system usage.

(b) User satisfaction as surrogate indicator of IS success:

A surrogate indicator of IS success often suggested is user satisfaction. Many IS empirical researchers have regarded user satisfaction as important proxy of IS success and it is the most employed measure of IS success due to its applicability and ease of use (Zviran and Erlich, 2003).

In IS literature, user satisfaction has been defined and described by linking attitudes à behaviour. For example, Baroudi *et al*. (1986) defined it as the *"extent to which users believe the information systems available to them meets their information requirement"*. Baroudi *et al*. (1986) highlight that user satisfaction is an attitude toward the IS.

In contrast to the technology acceptance literature, system and information characteristics have been core elements in the literature on user satisfaction (DeLone and McLean 1992). Within this literature, user satisfaction is typically viewed as the attitude that a user has toward an information system; Doll and Torkzadeh (1991) say that user satisfaction is an important theoretical construct because of its potential to determine both upstream and downstream links in this value chain (figure 1). Upstream activities refer to factors that cause satisfaction, where user satisfaction is treated as a dependent variable and downstream activities refer to behaviors affected by satisfaction, where user satisfaction is treated as an independent or antecedent factor (Doll and Torkzadeh, 1991).



Source: Doll and Torkzadeh (1991)

Fig. 1: Systems to Value Chain

In a review of user satisfaction research, Au *et al*, 2002, showed that user satisfaction research has focused on the upstream activities and studies on the downstream chain have been relatively narrow. In similar vein, a review of antecedents of IS success show that research concerning performance related behaviour has been light and contains only a few concepts, with measures such as the one identified as "individual impact" by DeLone and McLean (1992).

One of the implicit suppositions made by researchers employing user satisfaction measurements for IS effectiveness evaluation is that there will be a correlation between user satisfactions and IS effectiveness. However, as noted by Gatian (1994) as well as Melone (1990), there is evidence that this is an inaccurate assumption. Such an argument was developed by Melone (1990) in a review of a range of literature. Firstly, user satisfaction as a measure of effectiveness implies a particular view of the organization and its management, namely a focus upon support rather than output. Secondly, Melone argued that it possible to have an effective IS system without satisfied users.

Gatian's review of user satisfaction concluded that user satisfaction alone is not sufficient to adequately capture the full meaning of IS effectiveness, since it does not linking user satisfaction with measures of user behavior. Doll and Torkzadeh (1991) pointed out that to define *"performance related behaviors that link user satisfaction with social and economic impact"* was a problem for IS researchers. They argued that too often-such performance related indicators might be specific to individual systems and hence have no broad use.

(c) DeLone and McLean Information success model:

Although user satisfaction has for a long time been recognized as an indicator of IS success (Bailey and Person, 1983; Ives *et al*., 1983), the mechanism by which to measure it was not clear. Information and system features were not always been explicitly separated as dimensions of user satisfaction until DeLone and McLean (1992) distinguished information quality and systems quality.

DeLone and McLean (1992) conceptually developed, but did not empirically test, a model of IS success that included six aspects: system quality, information quality, use, user satisfaction, individual impact and organizational impact. System quality, refers to the characteristics of the information system as well as the "processing" of the system, the flexibility offered by the system, the amount of information/resources it accesses, etc. DeLone and McLean (2003) refer to information quality as a "content issue."

Seddon (1997) modify DeLone and McLean's model and proposes an alternative model that focuses on the causal (variance) aspects of the interrelationships among the taxonomic categories and separates the variance model of IS success from the variance model of behaviors that occur as a result of IS success. Seddon (1997) IS success model includes three classes of variables: (1) measures of Information Quality and System Quality; (2) general perceptual measures of net benefits of IS use (i.e. Perceived Usefulness and User Satisfaction); and (3) other measures of net benefits of IS use. Seddon (1997) also claims that IS Use is a behaviour, not a success measure and replaces DeLone and McLean's (1992) IS Use with Perceived Usefulness, which serves as a general perceptual measure of the IS use, to adapt his model to both volitional and non-volitional usage contexts.

Rai *et al*. (2002) further built on DeLone and McLean and Seddon. They viewed usefulness as being related to individual impacts and noted that it was based on several of the constructs DeLone and McLean had linked to individual impacts, such as improved individual productivity.

DeLone and McLean (2003) presented a reformulated version of their classic model, taking into account both the changing nature of IS and some of the criticisms directed at their 1992 model. The criticisms that they take into consideration concern elements included in the quality dimension and the nature of the impacts. DeLone and McLean refined their model by merging all impacts (including organizational and individual) in one generalized component, net benefits. They also added a return loop from net benefits to intention of use and user satisfaction. Net benefits generalize the notion of benefits since many researchers suggested the impacts of IS could be expanded to include diverse entities.

4-The Integrated Research Framework and Hypotheses:

The Integrated Research Model is presented in Figure (2). The incorporation of quality into the HRIS success model must describe the dependency of user satisfaction on system quality and information quality. This supports the underlying belief in DeLone and McLean's 1992 model that user involvement should lead to increased positive outcomes for the user. Accordingly, perceived system and information quality constructs from DeLone and McLean and Rai *et al*. (2002) modified Seddon model are posited as two key drivers of user satisfaction.

DeLone and McLean (1992) describe individual impact as "*an indication that an information system has given a user a better understanding of the decision context, has improved his or her decision-making productivity, has produced a change in user activity, or has changed the decision maker's perception of the importance or usefulness of the information system*" (p. 69), Seddon (1997) belief individual impact mean benefits accruing to individuals from using the IS.

We do claim that perceived usefulness covers some aspects of individual impact. Perceived usefulness essentially covers the impact on decision-making productivity. Nevertheless, in this study Perceived usefulness refers to the degree to which a user believes that using HRIS would enhance his or her job performance" (Davis 1989)

DeLone and McLean (2003) say that the "net benefits" variable must be defined within the context of the system under study and within the frame of reference of those assessing the system impact, as these variables substantially influence what constitutes net benefits and hence IS success, accordingly, in this study, the success construct refers to the actual benefits adopters receive from using the HRIS and includes a myriad of benefits covers the impacts of HRIS these can be grouped into two categories (Hussain *et al*. 2007). The first category is direct benefits. Benefits in this category are mostly operational savings related to the internal efficiency of the organization such as: cost-cutting. The second category is indirect benefits, which refer to the impact of HRIS on the business process. These include HR Planning, Salary Advice, Employee Benefits, Industrial Relations, Assessment and Training Needs and Recruitment and Performance Management (Hussain *et al*, 2007).

The proposed constructs and hypotheses are fully supported by prior studies in the IS literature Drawing upon the literature and based on the present research context, we hypothesize the following:

H 1: HRIS user satisfaction is positively associated with HRIS System quality.
H 2: HRIS user satisfaction is positively associated with HRIS information quality.
H 3: HRIS user satisfaction is positively associated with HRIS Perceived Ease of Use
H 4: HRIS user satisfaction is positively associated with HRIS Perceived Usefulness
H5: HRIS Success is positively associated with HRIS users' satisfaction.

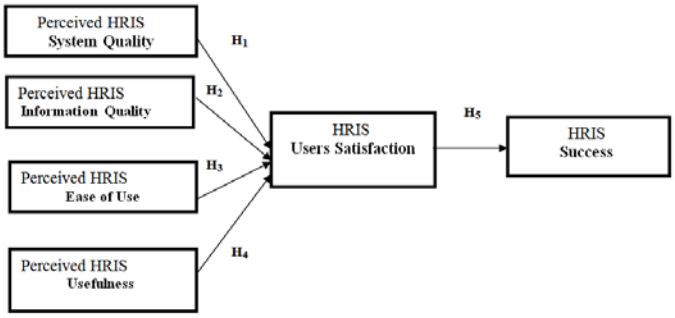


Fig. 2: The Integrated HRIS Success Research Model

Methodology:

In this section we discuss sample and data collection procedures and operational measures of variables used in the study as well as the statistical tests used to evaluate the hypothesis.

Population, Sample and procedures:

The population of study consisted of HR employees at greater Amman municipality recently-implemented a new HRIS, Greater Amman municipality has around 18,000 full time staff members in general and serving the needs of a 2.2 million population, district accounts for 40% of Jordan's population, spread over an area of 688 km2. 27 administrative regions make up the municipality Amman's.

The questionnaire was to be administered to all HR employees who use the municipality recently-implemented HRIS. The goal of HRIS is to keep track of all of each department's diverse HR data and include job history, current and historical pay details, inventories of skills and competencies, education and training records, performance assessment details, absence, lateness, accident, medical and disciplinary records, warning and suspensions, holiday entitlements, pension's data and termination records and productivity evaluation. The typical HRIS user is HR officer in each HR department or administrative regions who uses the system for about 12-20 hours per week, same system was in use in all departments and all users had been trained by the same trainers.

The questionnaires were distributed to all HR employees from different job levels and functions within the 27 administrative regions. They were distributed through an officer/coordinator from either the human resource or administration department within the municipality.

A covering letter explaining the purpose of this study was attached together, assuring them of the confidentiality of their responses and instructing them to complete the questions, seal and return the completed questionnaires using the attached envelope. Out of the 300 questionnaires distributed to HR employees, 230 usable questionnaires were returned, yielding a response rate of 76.6 percent, which is considered acceptable. There were 178 male and 63 female respondents. The age range of the sample was from ages 21 to 45 years with a mean of age 33 years. Out of 230 respondents, 82 (over 35 percent) had achieved at least a high school qualification. Approximately 87% of the participants had more than 5 years experience in using computers

Variable measurements:

In developing measures for the constructs proposed in the model, we made use of previous validated measures wherever possible in order to enhance validity (Tojib and Sugianto, 2006). Thus, we have adapted items identified in previous studies and modified them for use in the HRIS context.

After surveying the literature for existing constructs, initial item pools were created for each of these. We added additional items where important aspects of a construct's content domain have not been covered.

In order to ensure the content validity of the item pool, the first draft of instrument was pre tested by five researchers and experts in the fields of IS each one with practical and/or academic experience. Each expert was provided with a working definition of the construct being measured and was asked to rate: how well they felt individual statements reflected the stated definition; their opinion of whether the questions were likely to accurately measure each dimension; whether the questions were vague, ambiguous, difficult to understand, or had contradictions; whether there was incompatibility between any item and the dimension it was supposed to measure; and whether there were any set of items that did not fully capture the dimension it was supposed to measure. The aim was to detect and remedy errors in the instrument design (Cavana *et al*, 2001). Based on the experts' feedback, both the choice of items as well as the wording was refined

Independent variables:

A total of 30 questions captured the four independent variables under investigation. The questionnaires on independent variables were grouped into four variables; namely, perceived HRIS system quality, perceived HRIS information quality, perceived HRIS ease of use and perceived HRIS usefulness, the importance of the four constructs are described below:

Perceived HRIS system quality:

This principle refers to the technical details of the information system interface (DeLone and McLean, 1992). Many different instruments to measure system quality have been adopted in the previous literatures, a six-item scale was adopted and refined from instruments used by Wixom and Todd (2005) and Huang, *et al*. (2004) were used to operationalize HRIS System quality.

Perceived HRIS information quality:

This principle can be defined as the quality of the information that the HRIS produces and delivers (DeLone and McLean, 1992). HRIS information quality suggests delivering relevant, updated and easy-to-understand information to significantly influence users' satisfaction (Wixom and Todd, 2005). HRIS is suggested to facilitate the provision of quality information to management for informed decision-making. An HRIS is, therefore. A medium that helps HR managers perform their job roles more effectively.

This construct was measured by a ten-item scale from Bailey and Person (1983), with modifications to fit the specific context of HRIS, 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.

Perceived HRIS ease of use:

This principle refers to the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989), in TAM, ease of use is an important determinant of use of technology or systems, as is perceived usefulness (Davis, 1989). Venkatesh and Davis (1996) reinforced the importance of ease of use in TAM, since many types of technology were rejected due to poor user interface design. This construct was measured with a four-item scale developed by Sun and Zhang (2006).

Perceived HRIS usefulness:

This principle refers to the degree to which a person believes that using a HRIS would enhance his or her performance within an organizational setting (Davis, 1989). Accordingly, a user's primary motivation to use the HRIS will derive from the functions it performs for him/her.

This construct was measured with a six-item scale from by Sun and Zhang (2006).

HRIS user satisfaction:

In this research, we consider satisfaction as an accumulative evaluation that requires summing the satisfaction associated with various factors. In this sense, user satisfaction with a HRIS is an evaluative judgment regarding a specific HRIS experience and the affective attitude to the HRIS of the employee who interacts directly with the system (Doll and Torkzadeh 1988). This construct was measured with a four-item scale from Seddon and Yip (1992). The construct evaluates adequacy, efficiency, effectiveness and overall satisfaction with the HRIS.

Dependent variable:

HRIS success. HRIS success can be defined as an achievement of a firm's objectives for using the HRIS and achievement of end-user related objectives from using them. These covers actual benefits adopters receive from using the HRIS and include a myriad of benefits covers the impacts of HRIS. This was operationalized by a six-item scale adopted from (Hussain *et al*. 2007; Tansley *et al*, 2001) and some HRIS experts' advice.

Analysis of data:

The statistical computer program used for the questionnaires data analysis was SPSS for Windows Version 11.0. Correlation studies were used to determine the relationship between the dependent and independent variables. Perceived HRIS system quality, perceived HRIS information quality, perceived HRIS ease of use and perceived HRIS usefulness were regressed against HRIS satisfaction. The multiple regression analyses confirmed the significance of the independent and dependent variables.

RESULTS AND DISCUSSION

Factor analysis and scale reliabilities:

A principal component factor analysis with varimax rotation was conducted to validate the underlying structure of system quality, information quality, usefulness, ease of use and user satisfaction (Table I). In interpreting the factor, only a loading of 0.5 or greater on the factor and 0.35 or lower on the other factors are considered. Results of the varimax rotated analysis indicated the existence of five significant factors with eigenvalues (i.e. 2.690) greater than one that explained 53.79 percent of the variance. The KMO measure of sampling adequacy value for the item was 0.84 indicating sufficient intercorrelations with the Bartlett's test of spehericity was also found to be significant (Chi-square = 471:056, $p < 0.001$). These factors were namely perceived HRIS System Quality (six items), perceived HRIS information quality (ten items), perceived HRIS

ease of use (four items), perceived HRIS usefulness (six items) and HRIS satisfaction (four items), respectively. Thus, a model with five factors may be adequate to represent the data because the result of the analysis can be considered satisfactory since they do not exceed 60 percent of the explained variance recommended in social sciences (Hair *et al*., 2006). The results of the factor analysis are summarized in Table I.

Similarly, another factor analysis was undertaken to see the dimensionality of the independent variable (HRIS Success). A single factor solution emerged with eigenvalue of 2.32 explaining 46.45 percent of variance in the data. The KMO measure of sampling adequacy was 0.83 indicating sufficient intercorrelations, while the Bartlett's test of sphericity was significant (Chi-square =338:922, p < 0:01). Thus, we have further evidence of the factorability of the items.

Table 1: Factor analysis and scale reliabilities – independent variables

Measure	Items	Factor loading	KMO	Eigenvalue	Variance explained (%)	Reliability
Independent variables						
Perceived HRIS System Quality	6	0.510-0.756	0.842	2.690	53.79	0.80
Perceived HRIS information quality	10	0.531-0.945				0.70
perceived HRIS ease of use	6	0.516-0.802				0.72
perceived HRIS usefulness	6	0.700-0.795				0.83
HRIS satisfaction	4	0.598-0.719				0.74
Dependent variable						
HRIS Success	6	0.653-0.797	0.831	2.323	46.45	0.79

The reliability of the questionnaire was tested according to Cronbach alpha measurements. The reliability coefficient (alpha) of the independent variables was as follows: perceived HRIS system quality (80 percent); perceived HRIS information quality (70 percent); perceived HRIS ease of use (72 percent), perceived HRIS usefulness (83 percent) and HRIS satisfaction (74 percent). The reliability coefficients of all the five variables were above 0.70, which concurs with the suggestion made by Nunnally (1978).

Descriptive Statistics Analysis:

Table 2 indicates that HR employees' perceived HRIS system quality (with the highest mean scores, i.e. M = 3:92, SD = 0:56) to be the most important HRIS success factor and evident to a considerable extent, followed by perceived HRIS usefulness (M = 3:73, SD = 0:61) and perceived HRIS ease of use (M = 3:72, SD = 0:59). Perceived HRIS information quality (M = 3:69, SD = 0:60), with the lowest mean score was perceived on the overall as least HRIS perceived variable.

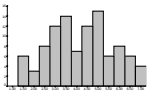
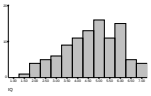
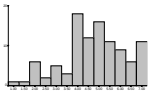
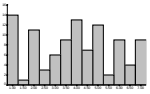
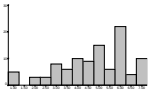
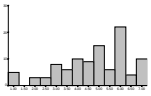
Meanwhile, the degree of HRIS system quality, information quality, usefulness and ease of use on users' satisfaction and HRIS success was largely positive. The standard deviations were quite high, indicating the dispersion in a widely spread distribution. This means that the effects of independent variables users' satisfaction and HRIS success are an approximation to a normal distribution. This also indicates that respondents had high levels of user satisfaction.

Correlation analysis: relationships between the variables:

The correlation matrix in Table 2 further indicates that perceived HRIS system quality, perceived HRIS information quality, perceived HRIS ease of use and perceived HRIS usefulness, were positively and moderately correlated with and HRIS satisfaction and HRIS success.

There was a significant positive relationship between Perceived HRIS usefulness and HRIS satisfaction (r =0.61, n = 230, p < 0:01). The positively moderate correlation were for Perceived HRIS information quality and HRIS satisfaction (r = 0.51, n = 230, p < 0:01), perceived HRIS System Quality and HRIS satisfaction (r = 0.41, n = 230, p < 0:01) and between HRIS success and HRIS satisfaction (r = 0.57, n = 230, p < 0:01). The weakest correlation was for Perceived HRIS ease of use and HRIS satisfaction (r = 0.38, n = 230, p < 0:01). The correlation coefficients between the independent variables (i.e. perceived HRIS system quality, perceived HRIS information quality, perceived HRIS ease of use and perceived HRIS usefulness) and the dependent variable (i.e. HRIS satisfaction) were less than 0.9, indicating that the data was not affected by a collinearity problem (Hair *et al*., 2006). These correlations are also further evidence of validity and reliability of measurement scales used in this research (Hair *et al*., 2006). The results indicate that the most important variable affecting HRIS satisfaction was HRIS information quality (i.e. with the highest scores of correlation), which goes to prove that high levels of information quality lead to high levels of satisfaction.

Table2: Correlations of independent variables and dependent variable

Variable	No. of items	Mean	S.D.	Histogram	1	2	3	4	5	6
Perceived HRIS System Quality	6	3.92	0.56		1.00					
Perceived HRIS information quality	10	3.69	0.60		0.52*	1.00				
Perceived HRIS ease of use	4	3.72	0.59		0.49*	0.55*	1.00			
Perceived HRIS usefulness	6	3.73	0.61		0.53*	0.60*	0.68*	1.00		
HRIS satisfaction	4	3.91	0.54		0.41*	0.51*	0.38*	0.61*	1.00	
HRIS Success	6	3.76	0.59		0.40*	0.46*	0.49*	0.55*	0.57*	1.00

Notes: n = 230; *Correlation is significant at p < 0.01 level (2-tailed)

Multiple regression analysis:

Research hypotheses were tested using a multiple regression analysis. It is a useful technique that can be used to analyze the relationship between a single dependent (criterion) variable and several independent variables (predictor or explanatory) variables at one time. In this analysis, a set of independent variables is weighted to form the regression variate (regression equation or model) and that may be used to explain its relative contribution toward one dependent variable (Hair *et al*., 2006). This analysis was undertaken to better understand the relationship between perceived HRIS system quality, perceived HRIS information quality, perceived HRIS ease of use, perceived HRIS usefulness, were positively and moderately correlated with and HRIS satisfaction. The summary of the result analysis is depicted in Table 3.

Table 3: Regression analysis of Independent variables on HRIS satisfaction

		HRIS satisfaction			Collinearity Statistics	
Independent variables	Beta	t-value	Sig.	result	Tolerance	VIF
(constant)		2.39	0.02			
Perceived HRIS information quality	0.339	5.145	0.00**	Accept	0.599	1.67
Perceived HRIS system quality	0.161	2.372	0.02*	Accept	0.563	1.776
perceived HRIS ease of use	0.039	0.607	0.54	Reject	0.638	1.568
perceived HRIS usefulness	0.096	1.312	0.02*	Accept	0.482	2.077

Overall model F = 32:29; p , 0.01; R^2 = 0:419; Adjusted R^2 = 0:406; Durbin-Watson test = 1:922

Notes: n = 230; *Significant at p , 0.05 level (2-tailed); * *Significant at p , 0.01 level (2-tailed)

As noted in Table 3, the F-statistics produced (F = 32:29) which was significance at 1 percent level (Sig. F = 0:000), thus confirming the fitness for the model. The Durbin-Watson of 1.922 falls between the acceptable range (1.5 < D < 2.5) indicating no autocorrelation problem in the data. Therefore, it indicates that the error term is independent. The results indicate no multicollinearity problems (the multicollinearity statistics shows that the tolerance indicator for perceived HRIS system quality, perceived HRIS information quality, perceived HRIS ease of use and perceived HRIS usefulness are all greater than 0.1 and Variation Inflation Factors (VIF) are all lesser than 10). This indicates that there is a statistically significant relationship between perceived HRIS system quality, perceived HRIS information quality, perceived HRIS ease of use, perceived HRIS usefulness and HRIS users satisfaction.

The coefficient of determination, R^2 was 41.9 percent. This expresses that 41.9 percent of the variance in HRIS satisfaction was explained by factors of Perceived HRIS System Quality, Perceived HRIS information quality, Perceived HRIS usefulness and Perceived HRIS ease of use.

The results also indicated that there were three variables; namely, perceived HRIS system quality, perceived HRIS information quality, perceived HRIS usefulness which are positively associated with HRIS satisfaction. It can be argued that these three elements are all directly involved in the improvements in HRIS satisfaction. Moreover, the findings also indicate that the most important variable that explains the variance in HRIS satisfaction was HRIS information quality and were significant at the 1 percent levels ($p < 0.01$). The other variable, namely, perceived HRIS ease of use are not significantly associated with HRIS satisfaction. The results indicate support for the hypothesis H1, H2 and H4.

As noted in Table 4, H5 measures HRIS user's satisfaction and its association with HRIS Success. Simple regression analysis was performed between HRIS Success and HRIS users' satisfaction. The independent variable was satisfaction and the dependent variable was HRIS Success. Table 4 shows 58 percent of the variance in HRIS success is explained by HRIS users satisfaction ($R^2 = 0.579$), the F ratio of 35.29 is highly significant ($p < .001$), the t-test is significant ($p < .05$), ($t (277) = 6. 455$) and the standardized Beta value is 0.439. So HRIS users' satisfaction makes a significant contribution to explaining HRIS success. These results indicate support for hypothesis 5

Table 4: Regression analysis of HRIS users' satisfaction on HRIS Success

		HRIS Success			Collinearity Statistics	
Independent variables	Beta	t-value	Sig.	result	Tolerance	VIF
HRIS users satisfaction	0.439	6. 455	0.00**	Accept	0.379	2.635

Overall model F = 35.29; p , 0.01; $R^2 = 0.579$; Adjusted $R^2 = 0.502$; Durbin-Watson test = 1.74
Notes: n = 230; *Significant at p , 0.05 level (2-tailed); * *Significant at p , 0.01 level (2-tailed)

Discussion, Conclusion and Implication for Further Research:

This research was in response to the call for continuous challenge and test of IS success models, especially within the HR context (Hagood and Friedman, 2002; DeLone and Mc Lean, 2003).

Based on the previous IS success models, this study presented and validated a comprehensive, multidimensional model of HRIS success, which consists of six success measures: perceived HRIS system quality, perceived HRIS information quality, perceived HRIS ease of use, perceived HRIS usefulness, HRIS satisfaction, HRIS success (net benefit).

The empirical evidence HRIS success was affected by HRIS satisfaction, which, in turn, was influenced by perceived HRIS system quality, perceived HRIS information quality, perceived HRIS ease of use and perceived HRIS usefulness.

The results of this study revealed that there is a high association between perceived HRIS information quality and HRIS satisfaction. Many studies have found that information quality is important for the success of general IS (Rai *et al*, 2002).

While our research confirms the previous research and found that there is a high association between information quality and user satisfaction in the HRIS context, HRIS need to provide information to aid users decision-making. The information given by HRIS should be just sufficient for the users to make a decision and care should be taken to avoid giving too much, as this is likely to result in information overload. Users may be influenced by the extent to which the information is accurate or correct; and the extent to which the information is at the right level to meet user needs. The study results show that HRIS information quality makes HRIS more valuable to users by providing them with up to date, complete and detailed information to assist their decisions and by providing them with easy to understand information that is relevant to their work. These in turn, will create a sense of satisfaction with HRIS.

Researchers in the area of conventional IS generally regarding system quality to be a highly important characteristics of all interactive computer systems (Rai *et al*, 2002), independent of the specific application the system was designed to support. In turn, the finding of this research suggests that the greater the perceived system quality of a HRIS, the higher is the user satisfaction, agreeing with the literature noted above, specifically between satisfaction and the extent to which the users believes the HRIS allows information to be readily accessible to them, makes information accessible, the ease with which a user can user first time he/she access and the extent to which HRIS can flexibly adjust to new work demands. Thus, this research supports that literature that has empirically investigated the relationship between system quality and satisfaction, mostly in a non-HR environment.

Our results suggest that perceived HRIS usefulness has a significant effect on HRIS satisfaction. In contrast, there was a weak relationship between perceived HRIS ease of use and HRIS satisfaction. Perceived HRIS ease of use was found to have insignificant contributions towards HRIS satisfaction. Our results suggest that in contexts where effective task execution substantially depends on the system such as the case with HRIS, beliefs about the system usefulness are more dominant in shaping user satisfaction than beliefs about Ease of Use.

As we knew from previous research, perceived usefulness was always an important determinant of attitude in TAM and it may mediate the influence of perceived ease of use on attitude. Indeed, perceived ease of use has long been recognized as a basic requirement for system design (Davis, 1989). Another interpretation is that difficulty in using systems is becoming less of a concern as they are increasingly user-friendly. In addition, since systems are more common and standardized nowadays, the users have become increasingly competent in using them. Accordingly, in the planning and development of HR systems, software developers should pay attention to practical functions and extend key features that are frequently required.

Our results support the posited impact of User Satisfaction on IS success as suggested by the DeLone and McLean (2003) models. This relationship is consistent with TAM, as the model also specifies attitudes towards using the system as shaping system usage behavior.

Implications for Theory and Academic Literature:

The contributions of this study HRIS success research are fivefold.

First, this study successfully respecified, integrated and validated the DeLone and McLean (2003) model by including TAM's perceived usefulness and perceived easy of use to the model, respecifying the scope of Net Benefits measures/surrogates and providing empirical support for part of the respecified model. By doing so, the model suggest HRIS success is a joint function of system and information characteristics and acceptance. By integrating these two powerful theories, this study suggests that the technology acceptance literature and the parallel user satisfaction stream are not competing approaches to understanding IT usage and value. That is, user satisfaction and TAM represent complementary steps in a causal chain from key characteristics of system design, to beliefs and expectations about outcomes that ultimately determine usage. The key consequents of HRIS success are user-related, recognising the employee's important role in determining the success of business endeavours.

Second, this study reconciled the respecified HRIS success model with Seddon's (1997) Perceived Usefulness measure, DeLone and McLean's (2003) Use/Intention to Use construct and Davis (1989) TAM. Accordingly, a revised TAM was also proposed by this study.

Third, the HRIS success model consists of three classes of variables: beliefs, attitudes and behaviours. Perceived HRIS system quality, perceived HRIS information quality, perceived HRIS ease of use, perceived HRIS usefulness represent beliefs, measures of HRIS satisfaction represent attitudes and HRIS success (net benefit) focuses on behavioural measures. The results support the belief-attitude-behaviour chain (see Figure 2), as suggested by the TAM (Davis, 1989).

The fourth contribution of the study is the development of a simple model that illustrates the importance of HRIS quality as criteria for HRIS success. The model appears to provide useful and pioneering insights into HRIS success. The role of the two IS quality components (system quality and information quality) is not new. However, the developed understanding of the two components in the context of HRIS and in the presence of TAM variables, through theoretical integration, provides new material.

Limitation of this research:

While the discussion reported in this study go some way to resolving the research problem outlined, much remains unresolved. Related to the research methods, there are several limitations of the research methods presented in this study.

Firstly, the discussed findings and their implications were obtained from one single study that examined one particular HRIS and targeted a specific users group in Jordan. Thus, caution needs to be taken when generalizing the findings and discussion to other HRIS systems or user groups. A cross-cultural validation using a large sample gathered elsewhere is required for greater generalization of the proposed model.

Second, this study did not validate the indirect and direct effects of Information Quality, System Quality and perceived easy to use and perceived usefulness on Net Benefits measures, as depicted in the respecified HRIS success model. Thus, future studies should also consider the relationships between the constructs and the measures as hypotheses that need to be evaluated in addition to the structural paths.

Third, this study merely developed and validated an HRIS success model using user perspective as the level of analysis. Future research may develop HRIS success models using other stakeholders and levels of analysis.

Despite these limitations, the present study provides valuable insights into the study of HRIS success. The acknowledged limitations of this study will be solved after data collection completed.

Appendix 1: HRIS SUCCESS QUESTIONNAIRE

HRIS System Quality
1. HRIS allows information to be readily accessible to me.
2. HRIS makes information very accessible.
3. HRIS is easy to use the first time I access.
4. HRIS can flexibly adjust to new work demands.
5. HRIS returns answers to my requests quickly.
6. HRIS is versatile in addressing needs as they arise.
Information Quality.
1. HRIS provides sufficient information
2. Information content provided by HRIS meet my needs
3. HRIS output is presented in a useful format.
4. HRIS provide reports that seem to be just about exactly what I need
5. HRIS produces comprehensive information.
6. HRIS provide up-to-date information.
7. I get form HRIS the information I need in time
8. HRIS information clear
9. HRIS information accurate?
10. HRIS precise information that I need
HRIS Perceived Ease of Use:
1. Learning to operate HRIS is easy for me
2. I find it easy to get HRIS to do what I want it to do
3. It is easy for me to become skilful at using HRIS
4. I find HRIS easy to use
HRIS Perceived Usefulness
1. Using HRIS enables me to accomplish job's tasks
2. Using HRIS enables to perform work's requirements more quickly
3. Using HRIS improves my job performance.
4. Using HRIS in job increases my productivity.
5. Using HRIS enhances my effectiveness in the job.
6. Using HRIS makes it easier to do my job.
HRIS Satisfaction.
1. HRIS meets the HR requirements of your area of responsibility
2. The HRIS is of high quality.
3. The HRIS has met your expectations.
4. Overall, I'm satisfied with Using HRIS
HRIS Success
1. Using HRIS enhances HR Planning
2. Using HRIS enhances salary advice
3. Using HRIS increases employee benefits
4. Using HRIS improves the assessment and training needs
5. Using HRIS enhances, Industrial Relations
6. Overall, Using HRIS enhances Recruitment and Performance Management

REFERENCES

Au, N., E. Ngai and E. Cheng, 2002. 'A Critical Review of End-User Information System Satisfaction Research and a New Research Framework', Omega: The International Journal of Management Science, 30: 451-78.

Avgerou, C., 2000 'Information Systems: What Sort of Science Is It? ', *Omega: The* International Journal of Management Science, 28: 567-69.

Bailey, J. and S. Pearson, 1983 'Development of a Tool for Measuring and Analyzing Computer User Satisfaction', Management Science, 5: 519-29.

Ball, K., 2001. 'the use of human resource information systems: a survey', Personnel Review, 30: 677-93.

Baroudi, J., M. Olson and B. Ives, 1986. 'An Empirical Study of the Impact of User Involvement on System Usage and Information Satisfaction', Communications of the ACM, 29: 232-38.

Beckers, A. and M. Bsat, 2002. 'A DSS classification model for research in human resource information systems', Information Systems Management, 19: 1-10.

Beckers, A., M. Bsat, 2002. 'A DSS classification model for research in human resource information systems', Information Systems Management, 19: 41-50.

Bsat, M. and M. Beckers, 2006. 'A comparison between electronic human resource systems', E- Business Review, 6: 20-23.

Cavana, R., B. Delahaye and U. Sekaran, 2001. 'Applied Business Research: Qualitative and Quantitative Methods: John Wiley & Sons Australia.

Davis, F., 1989. 'Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology', MIS Quarterly, 13: 319-40.

Delone, W. and E. Mclean, 1992. 'Information Systems Success: The Quest for the Dependent Variable', Information Systems Research, 3: 60-93.

Delone, W., and E. Mclean, 2003. 'the Delone and Mclean Model of Information Systems Success: A Ten-Year Update, 'Journal of Management Information Systems', 19: 9-30.

DeSanctis, G., 1986. 'Human resource information systems: a current assessment', *MIS Quarterly*, March, 15-27.

Doll, W.J. and G. Torkzadeh, 1988. 'The Measurement of End User Computing Satisfaction', MIS Quarterly, 12: 259-74.

Doll, W., and G. Torkzadeh, 1991. 'the Measurement of End-User Computing Satisfaction: Theoretical and Methodological Issues', MIS Quarterly, 17: 5-10.

Etezadi-Amoli, J. and A. Farhoomand, 1991. 'On End-User Computing Satisfaction', MIS Quarterly, 15: 1-4.

Gatian, A., 1994. 'Is User Satisfaction a Valid Measure of System Effectiveness?', Information & Management, 26: 119-31.

Gelderman, M., 1998. 'The Relation between User Satisfaction, Usage of Information Systems and Performance', Information & Management, 34: 11-18.

Hagood, W. and L. Friedman, 2002. 'Using the balanced scorecard to measure the performance of your HR information system, Public Personnel Management, 31: 543-57.

Hair, J., W. Black, B. Babin, E. Rolph and R. Tatham, 2006. 'Multivariate Data Analysis (6 Ed.). Upper Saddle River- New Jersey: Pearson Educational International -Prentice Hall.

Hendrickson, A., 2003. 'Human resource information systems: backbone technology of contemporary human resources', Journal of Labor Research, 24: 381-94.

Huang, J.H., C. Yang, B. Jin, H. Chiu, 2004. 'Measuring satisfaction with business-to-employee systems', Computers in Human Behaviour, 20: 17-35.

Hussain, Z., J. Wallace and N. Cornelius, 2007. 'The use and impact of human resource information systems on human resource management professionals', information & Management, 44: 74-89.

Ives, B., H. Olsoh and J.Baroudi, 1983. 'The Measurement of User Information Satisfaction ', Communications of the ACM, 26: 785-93.

Kovach, K., A. Hughes, P. Fagan and P. Maggitti, 2002. 'Administrative and strategic advantages of HRIS', Employment Relations Today, 29: 43-48.

Larsen, K., 2003. 'Taxonomy of Antecedents of Information Systems Success: Variable Analysis Studies', Journal of Management Information Systems, 20: 169-246.

Mahmood, M., J. Burn, L.A. Gemoets and C. Jacquez, 2000. 'Variables Affecting Information Technology End-User Satisfaction: A Meta-Analysis of the Empirical Literature', International Journal of Human-Computer Studies, 52: 751-71.

Mathieson, K., 1991. 'Predicting User Intentions: Comparing the Technology Acceptance Model with the Theory of Planned Behavior', Information Systems Research, 2: 173-91.

Melone, N., 1990. 'A Theoretical Assessment of the User Satisfaction Construct in Information Systems Research', Management Science, 36: 76-91.

Miller, J. and B. Doyle, 1987. 'Measuring Effectiveness of Computer Based Information Systems in the Financial Services Sector', MIS Quarterly, 11: 107-24.

Myers, B.L., L.A. Kappelman and V.R. Prybutok, 1997. 'A Comprehensive Model for Assessing the Quality and Productivity of the Information Systems', Information Resources Management Journal, 10: 6.

Ngai, E. and F. Wat, 2006. 'Human resource information systems: A review and empirical analyses, Personnel Review, 35: 297-314.

Nunnally, J.C., 1978. 'Psychometric Theory, 2nd ed., McGraw-Hill, New York, NY.

Rai, A., S. Lang and R. Welker, 2002. 'Assessing the Validity of IS Success Models: An Empirical Test and Theoretical Analysis', Information Systems Research, 13: 50-69.

Seddon, P., 1997. 'A Respecification and Extension of the Delone and Mclean Model of IS Success', Information Systems Research, 8: 240-53.

Seddon, P. and S. Yip, 1992. 'An Empirical Evaluation of User Information Satisfaction (UIS) Measures for Use with General Ledger Account Software', Journal of Information Systems, 6: 75-92.

Shrivatsava, S. and J. Shaw, 2003. 'Liberating HR through technology', Human Resource Management, 42: 201-222.

Stone, Dianna L. Stone-Romero, Eugene F. Lukaszewski, Kimberly, 2006. 'Factors affecting the acceptance and effectiveness of electronic human resource systems', Human Resource Management Review, 16: 229-244

Sun, H. and P. Zhang, 2006. 'The role of moderating factors in user technology acceptance', International Journal of Human-Computer Studies, 64: 53-78.

Tansley, C. and T. Watson, 2000. 'Strategic exchange in the development of human resource information systems (HRIS)', New Technology, Work and Employment, 15: 108-22.

Tansley, C., S. Newell and H. Williams, 2001. 'Effecting HRM-style practices through an integrated human resource information system: An e-greenfield site', Personnel Review, 30: 351-370.

Tojib, D.R. and L. Sugianto, 2006. 'Content Validity of Instruments in IS Research', Journal of Information Technology Theory & Application, 8(3): 31-56.

Venkatesh, V., M. Morris, G. Davis and F.D. Davis, 2003. 'User acceptance of information technology: toward a unified view', MIS Quarterly, 27: 425-78.

Wixom, B., and P. Todd, 2005.' A Theoretical Integration of User Satisfaction and Technology Acceptance', Information Systems Research, 16: 85-102.

Zviran, M. and Z. Erlich, 2003. 'Measuring IS User Satisfaction: Review and Implications', Communications of the Association for Information Systems, 12: 81-103.