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The Impact of Human Resource Information Systems on Human Resource Management Practices in the Public Universities in Saudi Arabia

Dr. Rashed Ghazi Alotaibi

Assistant Professor, Department of Business Administration - Shaqra University, Saudi Arabia

Abstract:

This paper evaluates the use of human resource information systems (HRIS) by employees working in the human resource management (HRM) departments of the public universities in Saudi Arabia. In view of the weaknesses of other HRIS success models for the particular environment in Saudi Arabia, this study has integrated some essential factors into the DeLone and McLean HRIS success model to develop a new model that provides comprehensive insight into the most important factors affecting the issue of HRIS within the HR Departments of Saudi universities. A quantitative and qualitative analysis were examined. The main findings showed that the use of HRIS was affected by six factors.

Keywords: Human Resource Management, HRM functionalities, Human Resource Information System

1. Introduction

With the rapid development of new ideas and technologies, management processes within organisations have been revolutionised. Various researchers have measured the effectiveness of management processes and improved technological awareness. (Wilcox,1997;Maund,2001; Lippert and Swiercz, 2005;Troshani et al. 2011).

Special areas of information and knowledge have appeared which have necessitated the application of an information system (IS) for better data management. Factors such as a shrinking work force, the global economic crisis and the role of technology in the execution of business operations have affected HR managers who have to deal with unexpected challenges in the future. According to Chmeilecki (2012), "Futurists say one thing is certain – HR executives will play a vital role in helping business organisations compete". The emergence of such trends has rendered the traditional functions and systems of HR absolutely inadequate for business competition in today's dramatically changing world market (Beckers and Bsat 2002, Maier et al. 2013).

Several changes are taking place in the IT landscape of Saudi Arabia. The proliferation of IT in various public and government institutes may raise a plethora of hurdles, which may hinder the successful adoption and implementation of HRIS in these institutes. The recent application of IT in the HR Departments of public universities in Saudi Arabia offers a unique situation to study the adoption and use of HRIS and how it affects the functions of HR.

The basic purpose of this study is to identify the key factors that determine the adoption of HRIS applications, and how these affect HRM functions in the HR Departments of Saudi Arabian public universities. These aspects carry great significance for two reasons; firstly, they offer a deep insight into the adoption and use of HRIS by Saudi public universities. Secondly, the proliferation of ISs has precipitated the need to analyse the costs and benefits of these applications.

This study considered only those factors affecting the adoption of HRIS applications and how their use may affect HRM functions, from the perspective of HR professionals and leaders in the public universities of Saudi Arabia.

1.1. Research Problem

The high UAI score for the Arab people indicates that they are intolerant and reluctant to adopt new behaviours, ideas and technologies. The current study tries to analyse adoption and use of HRIS models in the context of Saudi Arabian public universities. Previous studies have shown a plethora of factors affecting the adoption, implementation and usage of HRIS systems; however, it is unclear whether these variables may affect the adoption process of HRIS in all countries or just for a specific country. Therefore, these studies seem to suggest that many variables may interact to influence the adoption and usage of HRIS, instead of accruing independently. Consequently, they may potentiate or mitigate the relative effects of the adoption and the use of HRIS.

Most of the previous researches focused on financial institutions, such as banks and government organisations (AlShibly, 2011, Al-Qatawneh, 2012, AbuTayeh, 2012). Other researches focused on service companies and hospitals (Najia 2008). Any study till date has hardly examined universities (public universities) and their HRIS management practices. Al-Shibly (2011) states that research is quite scarce in this area and should be carried out in relation to the efficiency of the

systems in the Arab world. Consequently, the main goal of the research at hand is to analyse the adoption and the use of HRIS in Saudi public Universities, and how it can help to improve the practices of HRM.

1.2. Research Objectives

The main goal of this study is to investigate the adoption and use of HRIS, and how the HRIS can improve university performance. To achieve this goal, the study attempts to achieve the following objectives:

- To build a conceptual framework for HRIS in light of the literature review.
- To understand the relationship between HRIS and Human Resource practices in Saudi universities.
- To test empirically the proposed conceptual HRIS framework in the HRM departments of Saudi public Universities.
- To provide organisational recommendations based on the findings of this study for the Saudi public universities.

2. Literature Review

2.1. Human Resource Information Systems (HRIS)

Broderick and Boudreau (1991) defined HRIS as “the composite of databases, computer applications, and hardwares, and softwares necessary to collect/record, store, manage and manipulate data for human resources.” Later on, HRIS was defined as a system “which is used to acquire, store, manipulate, analyse, retrieve, and distribute information about an organisation’s human resources” (Kovach and Cathcart ,1999). A similar definition of HRIS has been put forward by Hendrickson (2003): “integrated systems used to gather, store and analyse information regarding an organisation’s human resources” (Hendrickson, 2003). Thus, it can be observed that HRIS includes different aspects of computers and technology being used for the functions of human resources in different contexts and in various organisations. Hedrickson further stretches the definition to include the people, policies, procedures and data required to manage the HR function” (Hedrickson 2003).

2.2. Adoption of HRIS in Saudi Arabia

The history of HRIS in Saudi Arabia is very new in public sectors. The concept of HRIS development in various organisational contexts is still novel. Research conducted on HRIS is very limited. However, researchers have conducted some studies to expose a few of the challenges faced by Saudi Arabian organisations connected with managing organisational resources due to poor HRM practices (Almalkiet al. 2011, Khalifa2013, Hasanainet al. 2014).

Significantly, there is very meagre evidence in the literature about HRIS use and its implementation in universities and higher education. Overall, the success factors for implementing HRIS tools in educational institutions are rather poorly explored.

A conceptual model for examining the adoption and success of HRIS in public sector organization in Saudi Arabia was conducted by Al-Khowaiter and et al, 2014. Their HRIS model was developed by integrating three different IS models – Unified theory of acceptance, TAM model of technology adoption and original Delone and McLean IS success into a single model. They used the social pressures construct to measure the intension of the use, instead of measuring its influence on the success of the HRIS in the public sector organization. The success dimension net benefit defined by Delone and McLean is the extent to which the HRIS contributes to the success of the stake holders. This shows that net benefit dimension is missing in their model.

2.3. DeLone and McLean Success Model

DeLone and McLean (1992) established one of the most extensively used models to explain IS success in different organisational set-ups. The main purpose of DeLone and McLean’s (1992) model was to reduce the bulk of variables that had been developed to explain HRIS adoption and success. The existence of so many different constructs to measure the success of HRIS adoption made it difficult to compare the results of similar studies and to build a cumulative body of empirical knowledge (DeLone and McLean, 1992).

Since the development of the DeLone and McLean model (1992), several researchers have used it to investigate HRIS adoption, acceptance and success (Landrum andPrybutok, 2004, HosnaviandRamezan, 2010, Al-Shibly 2011).

2.4. Updated DeLone and McLean IS Success Model

Based on the criticisms and recommendations of other IS researchers, DeLone and McLean (2003) modified their 1992 model and constructed a new model that incorporated service quality as one of the constructs to explain IS success. They proposed that information quality, system quality and service quality affect system use and user satisfaction (see Figure 1).

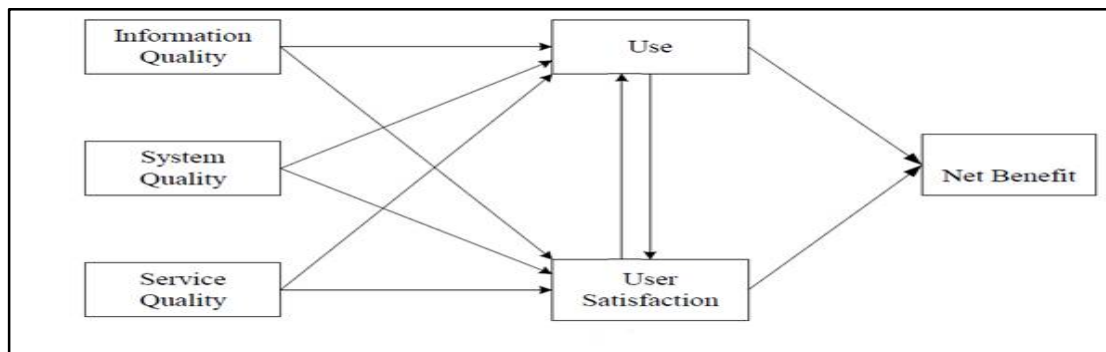


Figure 1: Updated DeLone and McLean IS Success Model. (DeLone and McLean, 2003)

3. Research Framework

In order to gather comprehensive and reliable data on HRIS Adoption and Use in Public Universities in Saudi Arabia, more than one conceptual model was taken into consideration. The updated DeLone and McLean IS success model (2003) served a reliable research tool.

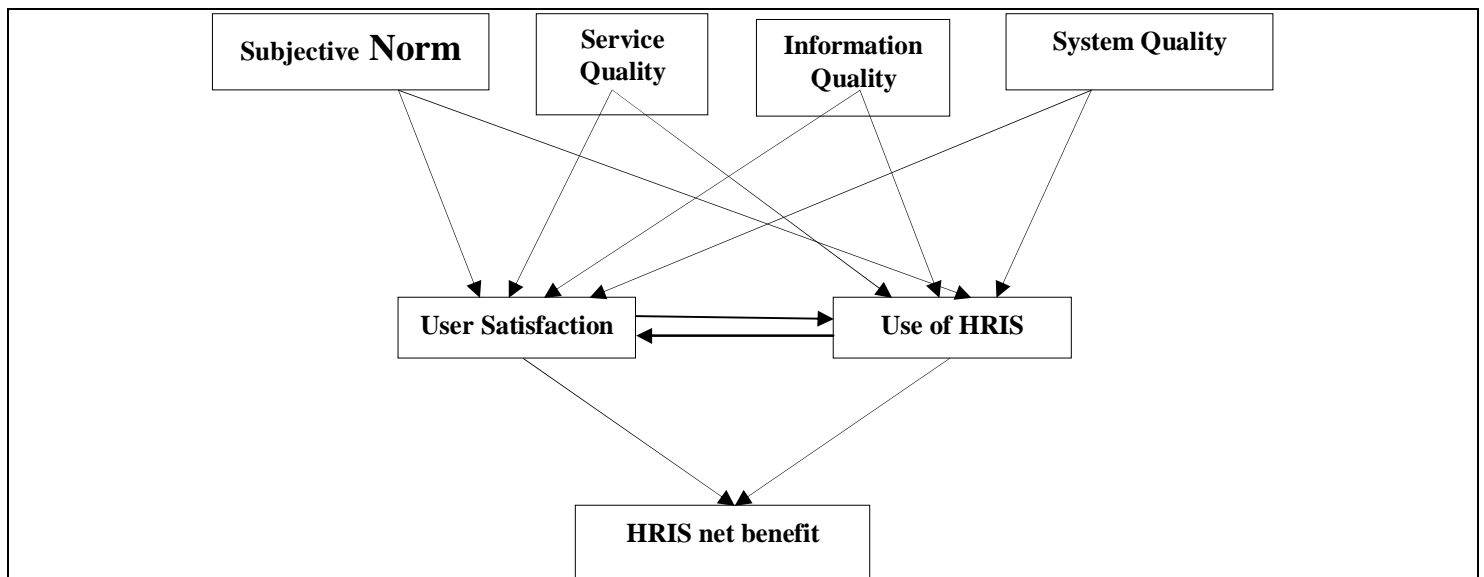


Figure 2: This Study's Proposed Research Conceptual Framework

The updated and modified HRIS model presented in Figure 2 has seven constructs: subjective norm, system quality, information quality and service quality (as independent variables) and system use and user satisfaction (as independent and dependent variables) and organisational impact (as a dependent variable). This model is tested using data collected from five Saudi Arabian public universities. The next section offers a comprehensive description of each construct and the hypothetical evidence for including it in the proposed conceptual model.

3.1. System Quality

System quality represents the quality of the information system processing itself, which includes software and data components, and it is a measure of the extent to which the system is technically sound. Seddon (1997) notes that system quality is concerned with whether there are bugs in the system, the consistency of the user interface, ease of use, and quality of documentation. System quality is measured by attributes such as ease of use, functionality, reliability, data quality, flexibility, and integration (DeLone and McLean 2003).

Many studies have found that system quality has a positive and strong correlation with user satisfaction at the individual level (Iivari, 2005). Petter and McLean (2008), in their investigation analysing nine different studies, also confirmed in a reliable way that systems' quality had a great impact on users' satisfaction.

Since the development of the IS success model by DeLone and McLean (1992), the system quality construct has been used by other researchers to explain the success of HRIS adoption and use. System quality is the degree to which HRIS is easy to use in accomplishing tasks (Schaupp, Fan and Belanger 2006). Davarpanah and Mohamed (2013), Al-Khowaiter (2013) used diverse system quality instruments, such as the reliability of computers, speed of response of online activities and ease of use to measure the appreciation of IS applications in an organisation.

- H₁: System quality will positively affect the use of HRIS.
- H₂: System quality will positively affect user satisfaction with HRIS.

3.2. Perceived HRIS Information Quality

In the very narrowed down context of information systems, in any system used to manage human resources, the quality of the information is very important. In general, its simplest definition is 'the quality of the information that the human resource information system produces and delivers' (DeLone and McLean 1992). The conclusion can be drawn that the delivery of relevant and up-to-date information that is easily understood can definitely have an impact on the level of user satisfaction (Wixom and Todd, 2005).

The following hypotheses are developed to test the impact of information quality on user satisfaction:

- H₃: Information quality will positively affect the use of HRIS.
- H₄: Information quality will positively affect the user satisfaction of HRIS.

3.3. Perceived HRIS Service Quality

In general, it is 'the quality of the information that the human resource information system produces and delivers' (DeLone and McLean, 1992). The conclusion can be drawn that the delivery of relevant and up-to-date information that is easily understood can definitely have an impact on the level of user satisfaction (Wixom and Todd, 2005).

Petter (2008) went further and assumed that the quality of such information is the major component influencing user satisfaction, along with user-friendly equipment (e.g. Rai 2002, Urbach, 2011, Halawai 2007). Hussain et al (2007) reported that use of HRIS is enhanced through increasing the information quality in both medium and large sized organizations. In addition, connecting quality with the DeLone and McLean model analysed earlier in the study, Petter and McLean (2009) stated that after closer insight into five different studies, they had found a strong relationship between information quality and being satisfied with IS, especially in HRM usage.

There have been no studies on measuring HRIS service quality in educational institutions. This gap has been identified and will be investigated by testing the following hypotheses:

- H₅: Service quality will positively affect the use of HRIS.
- H₆: Service quality will positively affect user satisfaction of HRIS.

3.4. Perceived HRIS Subjective Norm

Subjective norm is the opinion an individual has formed about what others believe and how they want an individual to behave or act (Ajzen and Fishbein 1980, Trafimow 1994). Trafimow (1994) and Kraus (1995) have reported that subjective norm and attitudes are reliable predictors of behaviours and intentions to behave in a certain way. Researchers that have investigated subjective norm, attitudes and perceived behavioural control include Ajzen (1991); Taylor and Todd (1995); Venkatesh and Davis (2000); Yuen and Ma (2001); and Wong et al (2005).

George (2004) used the theory of planned behaviour (TPB) to investigate the relationships between beliefs, Internet privacy and trustworthiness. George's (2004) findings suggest that individuals' beliefs about trustworthiness have a positive effect on attitudes towards buying online, which in turn confidently influence purchasing behaviour. A belief about self-efficacy with regard to purchasing has a positive effect on perceived behavioural control, which in turn influences online purchasing behaviour. Luan et al. (2005) investigated the use of the Internet by pre-service teachers, using survey questionnaires for 310 respondents. They found that pre-service teachers' use of the Internet was influenced by support from friends, confidence level and perceived attitude towards Internet use. This therefore suggests that individuals perceive that the use of IT can be influenced by what they feel others expect of them. This therefore leads to the following hypotheses:

- H₇: Subjective norm will positively affect the use of HRIS.
- H₈: Subjective norm will positively affect the user satisfaction of HRIS.

3.5. Perceived HRIS System Use

HRIS system use can be defined simply as the extent to which staff make use of the capabilities provided by the information system (DeLone and McLean, 2003).

System use measures the perceived actual use of HRIS by the staff of an organisation (Urbach, Smolnik and Riempp 2010). Other researchers have criticised system use as a measure to determine IS success. Zviran and Erlich (2003) argued that system use is not a strong construct to measure system success in a situation where system usage is mandatory, for example, when an IS required in a big hospital to provide accurate records of patients. However, if system use is used to measure system success by voluntary users, as opposed to captive users, then system use is appropriate (Lucas 1978, Welke and Konevski, 1980).

- H₉: The use of HRIS will positively affect the organisational benefit.

3.6. Perceived HRIS User Satisfaction

User satisfaction is a personal evaluation of a satisfied-unsatisfied scale of various aspects of an IS (Seddon 1997). DeLone and McLean, (1992) Wixom and Todd, (2005) and Jing and Yoo, (2013) contributed enormously to the subject matter of

establishing successfulness from the users' perspective of the implementation of IS. They also gave user satisfaction a status of a determiner of the success of an information system. It is a truth universally acknowledged that in a mandatory environment, satisfaction is more applicable to measuring a system's success than intention to use (Teo 2008, Lee and Park 2008).

- H₁₀: User satisfaction with an HRIS will positively affect organisation benefits.

3.7. Perceived HRIS Net Benefits

The "net benefits" dimension is regarded as an important indicator of the success of IS usage and adoption by organisations, as it measures the positive or negative impact on the profitability of the IS for the users within the organisation (Ishman, 1998).

The net benefits measure can be determined by involving various factors, such as the profitability of the IS, the objectives and contexts of the investment, and perceived usefulness. Taking multiple measures at various levels for measurement of net benefits is likely to complicate the data analysis and interpretation. To measure various aspects of the impacts, such as innovation, consumer satisfaction, management control and task productivity, Torkzadeh and Doll (1999) and Rai et al (2007) created a comprehensive instrument that has a strong fit with the net benefits construct in the DeLone and McLean model.

4. Methodology

This study tries to measure the descriptive aspects of human behaviour as they relate to HRIS use in the HR Departments of Saudi public universities, and it formulates the hypotheses and subsequently verifies them. Therefore, the quantitative research method is highly appropriated for this study.

The key target population for this study is HR staff and professionals who are regular HRIS users in their daily jobs, as they have a good understanding of the phenomenon under study. In addition, the HR professionals recruited for this study have HRIS administrative responsibilities in Saudi Arabian public universities and are experts in HRIS use.

The quantitative data collection, involved 368 HR employees working as HRIS staff within the HR Departments in five public universities in Saudi Arabia.

5. Data Analysis and Results

In total, 368 online surveys were distributed via emails to HR employees, staff, and professionals in the five Saudi public universities. Of these, a total of 250 questionnaires were completed. The response rate was: 68.47 per cent.

6. Profile of the Respondents

Tables 1 and 2 show the demographic profile of the respondents in this study.

	Age	Frequency	Percent %
Valid	1 from 18 to 24	10	4.0
	2 from 25 to 34	89	35.6
	3 from 35 to 44	109	43.6
	4 from 45 to 54	39	15.6
	5 from 55 and above	3	1.2
	Total	250	

Table 1

	Education Level	Frequency	Percent %
Valid	Some high school qualifications	37	14.8
	College	26	10.4
	Bachelor's Degree	87	34.8
	Master's degree	68	27.2
	PhD degree	32	12.8
	Total	250	

Table 2

7. Reliability Analysis (Cronbach's Alpha)

The table below presents the reliabilities (Cronbach's alpha) for the key variables used in this study.

Constructs	Number of Items	Cronbach's Alpha(α)
System quality	4	0.82
Information quality	4	0.81
Subjective norms	4	0.71
User satisfaction	4	0.85
Use of HRIS	3	0.85
Subjective norms	6	0.90
HRIS net benefit	4	0.93

Table 3: Reliabilities for Key Constructs

Cronbach's alpha was used to calculate the internal consistency of the items in each measurement scale. Overall, Table 3 shows that the Cronbach Alpha scores ranged from 0.71 to 0.93, indicating that all the scales used in this study had excellent internal consistency.

8. Hypothesis Testing

8.1. Correlations

A non-parametric correlation was calculated from the Kendall Tau-b test between observed ranked variables and research variables. The results are given in Table 4.

	System Quality	Information Quality	Service Quality	Subjective Norm	User Satisfaction	Use of HRIS	Organisation Net Benefit
Age	-0.071	-0.093	-0.094	-0.073	-0.228**	-0.007	-0.137**
Education	0.044	0.024	-0.034	-0.097*	0.093	0.080	0.040
Computer Skill Level	0.043	0.066	0.012	-0.099	0.076	-0.010	0.052
Use of Computer	0.102	0.097	0.102	0.051	0.123*	0.066	0.125*
Use of Internet	0.036	0.067	-0.015	0.066	0.085	0.066	0.094

* $p < 0.05$, ** $p < 0.01$

Table 4: Non-parametric Correlations: Kendall's Tau-b Test

The test indicates that age has a significant negative correlation with HRIS user satisfaction ($b = -0.228$, $p < 0.01$) and impact on the organisation ($b = -0.0137$, $p < 0.01$). As the age of the employees increases, HRIS users are less satisfied. Since the sample age ranges from 18 to 55+, the satisfaction of the younger group is relatively higher than the other three groups. A possible reason for the levels of user satisfaction is awareness of the HRIS system. As the lower age group respondents are relatively new to HRIS use, they are therefore more satisfied than those who have used it for many years or joined the organisation at a later age. Therefore, the higher age group members are less satisfied.

As the head of an organisation is more likely to be in the older group, the views of the older age group play a vital role in decisions related to HRIS implementation and use. Similarly, the age has a negative correlation with organisational impact. As the age of the employee increases, it has a negative impact on the organisational performance. In Saudi culture, members of the older age group rely more on the younger generation based on the demographic analysis of this study. Therefore, self-efficiency and performance decline with an increase in age. However, with the increased use of computers, employees are more satisfied ($b = 0.123$, $p < 0.05$), which has a positive impact on the organisation ($b = 0.125$, $p < 0.05$). However, education does not play a vital role in HRIS user satisfaction, but it has a significant negative correlation with subjective norm ($b = -0.097$, $p < 0.01$). Therefore, an employee with a higher level of education has a lower level of subjective norm. The Kendall Tau-b coefficient is calculated to find out the correlations in different research variables. (Table 5)

	System Quality	Information Quality	Information Quality	Subjective Norm	User Satisfaction	Use of HRIS	Organisation Impact
System Quality	1.000	0.533**	0.398**	0.271**	0.459**	0.296**	0.451**
Information Quality	0.533**	1.000	0.414**	0.286**	0.427**	0.338**	0.423**
Information Quality	0.398**	0.414**	1.000	0.252**	0.385**	0.203**	0.345**
Subjective Norm	0.271**	0.286**	0.252**	1.000	0.308**	0.146**	0.232**
User Satisfaction	0.459**	0.427**	0.385**	0.308**	1.000	0.320**	0.520**
Use of HRIS	0.296**	0.338**	0.203**	0.146**	0.320**	1.000	0.498**
HRIS net benefit	0.451**	0.423**	0.345**	0.232**	0.520**	0.498**	1.000

* $p < 0.05$, ** $p < 0.01$

Table 5: Non-Parametric Correlations: Kendall's Tau-b Test

The test indicates that all of the research variables have positive significant correlations with each other. Multiple linear regressions are carried out to find if the subjective norms, service quality, information quality and system quality are predictors of user satisfaction and HRIS use.

8.2. Regression Analysis

Multiple regression model is the best suited for this study as it will assist in answering the research questions and can therefore assist the researcher in answering the aim of the research.

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-0.213	0.198		-1.080	0.281		
System Quality	0.289	0.075	0.264	3.868	0.000	0.467	2.141
Service Quality	0.221	0.064	0.209	3.485	0.001	0.604	1.656
Subjective Norm	0.214	0.051	0.221	4.214	0.000	0.790	1.265
Information Quality	0.203	0.077	0.181	2.638	0.009	0.462	2.167
a. Dependent variable: user satisfaction							

Table 6: Coefficients^a

Model	Unstandardised Coefficients		Standardised Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.557	0.183	8.519	0.000		
	Information Quality	0.597	0.059	10.100	0.000	1.000	1.000
2	(Constant)	1.405	0.193	7.264	0.000		
	Information Quality	0.467	0.083	5.646	0.000	0.503	1.987
	System Quality	0.181	0.081	2.239	0.026	0.503	1.987
a. Dependent variable: HRIS use							

Table 7: Coefficients^a

A linear regression analysis is carried out to test the correlation between the HRIS use and user satisfaction. The standardised beta values are given in Table 7.

Model	R	R Square	Adjust-ed R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	0.421 ^a	0.178	0.174	0.736	0.178	53.525	1	248	0.000
a. Predictors: (constant), HRIS use.									

Table 8: Model Summary

From the regression model, it is evident that HRIS use accounts for 17.8 per cent of the variance in user satisfaction. The contribution of HRIS use is highly significant ($\beta = 0.421$, $p < 0.05$). HRIS use ($\beta = 0.264$) makes a high contribution towards the organisational net benefit. The association of HRIS use is given in Table 8.

Model	Unstandardised Coefficients		Standardised Coefficients	T	Sig.	Correlations		
	B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	1.172	0.201	5.836	0.00			
	Use of HRIS	0.427	0.058	7.316	0.00	0.421	0.421	0.421
a. Dependent variable: user satisfaction								

Table 9: Coefficients^a

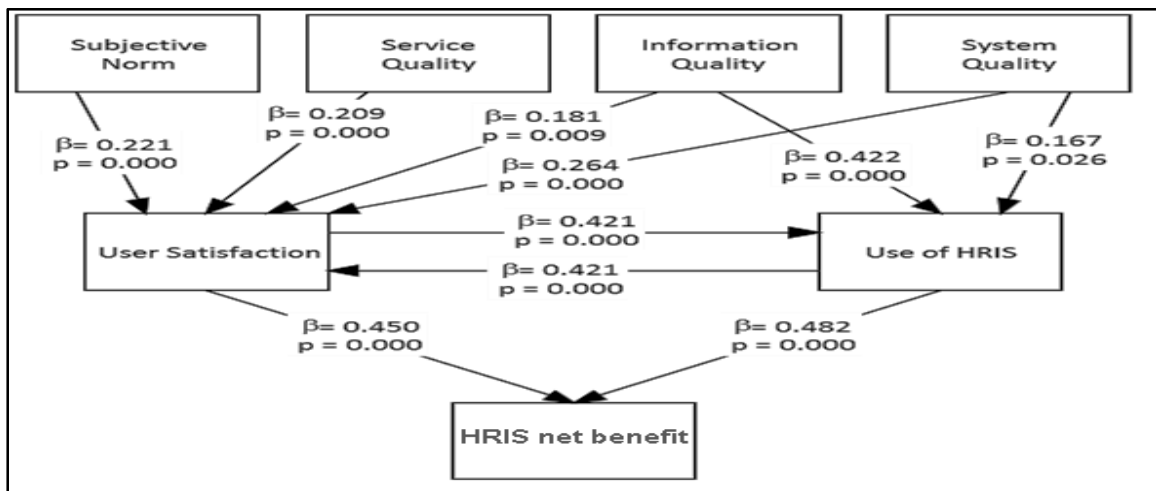


Figure 3 :Final Conceptual Framework (HRIS) Model

To conclude, the findings of this study showed that there is a positive and significant influence of all the independent variables (subjective norm, system quality, service quality, and information quality) on the dependent variables (use and user satisfaction). However, the information and system constructs have a positive and significant influence on the use of HRIS. Nevertheless, service quality and subjective norm do not have any influence on HRIS use. Subjective norm and service influence exert an indirect influence on the use of HRIS by affecting user satisfaction significantly. Both user satisfaction and the use of HRIS significantly affect each other. In addition, this study showed the significant relationship between user satisfaction and the use of HRIS with the net benefit of the organisation. The next chapter will discuss the findings by discussing the results of the data analysis to demonstrate each hypothesis used in the study.

9. Discussion

9.1. Relationship between Subjective Norm and the DeLone and McLean Model of Information Systems Success

It was hypothesised that subjective norm might positively affect user satisfaction. The results provided by the quantitative phase of this study supported the hypothesis by showing that subjective norm does have a significant influence ($p < 0.05$) ($\beta = 0.221$) on user satisfaction. This is one of the novel findings of the current study, which for the first time, shows that subjective norms influence user satisfaction and promote HRIS use. In the revised model of HRIS adoption put forward by DeLone and McLean, this dimension was not included, and several researchers have referred to the need for investigating this aspect, as it is considered a vital determinant of human behaviour.

According to AlQaisi (2009), the impact of subjective norms on user satisfaction is not significant in a voluntary context; however, he seems to suggest that the case may be different in the context of mandatory settings. It can be argued that the significant impact of social elements (subjective norm) on HRIS use is due to mandatory settings at the work place in the Arab world. The findings of AlQaisi (2009) support the outcome of the present study by showing the positive impact of the subjective norm on HRIS user satisfaction.

Venkateshet al. (2003) and Venkatesh and Davis (2003) support the findings of this study by positing that subjective norms' influence on HRIS user satisfaction is significantly high in mandatory settings. Nevertheless, these studies did not explain the mechanism for the effect of the subjective norm on HRIS user satisfaction. The real mechanism working behind the significant impact of subjective norm on the user satisfaction with HRIS is related to the cultural values, for example, the tendency of young people to do things according to the advice and suggestions of their peers, relatives and friends.

9.2. The Impact of System Quality on HRIS Use and user satisfaction

It was hypothesised that system quality, as a HRIS dimension, has a positive influence on HRIS use in public universities of Saudi Arabia. This research supported the hypothesis that there is a significant relationship between system quality and HRIS use ($p < 0.026$), ($\beta = 0.167$). Noordin et al. (2013) showed that the system quality of a knowledge management system was positively correlated with IS usage in the Malaysian context. These data are consistent with the findings of this study.

This study reveals that system quality exerts significant influence on user satisfaction ($p < 0.000$) ($\beta = 0.264$). By increasing user satisfaction, system quality undoubtedly has the potential to play a fundamental role in increasing the performance of HR Departments in Saudi public universities.

The implication of these findings for the leadership of Saudi public universities is that they cannot increase user satisfaction and HRIS use without maintaining system quality. Based on these data, management is required to check system

quality regularly. In some universities, they have legacy HRIS systems; the leadership should invest more to upgrade the HRIS system to enhance system quality, which will ensure greater use of HRIS in those schools.

9.3. The Impact of Information Quality on HRIS use and user satisfaction

This study reveals that information quality, as with system quality, is a predictor of both HRIS use and user satisfaction. The study showed a high degree of association between user satisfaction and information quality. Several studies have supported the finding that information quality is a critical factor in terms of its role in fostering successful HRIS use (Chie et al. 2007, Halawi et al. 2007, Kulkarni et al. 2006, Wu and Wang 2006). The studies conducted by Hosnavi and Ramezan (2010) in Iranian Oil Company to investigate the effectiveness of HRIS in HR department indicated strong association between the information quality and user satisfaction in Delone and McLean IS success model. Thus, these results are in line with the finding reported by this study. Hussain et al (2007) reported that user satisfaction with HRIS is enhanced through increasing the information quality in both medium and large sized organizations. They support the findings of this study, which has been conducted in large sized organizations such as public universities of Saudi Arabia. The greater the information quality, the greater the HRIS use. This finding was supported by previous researches (Kositanurit et al. (2006); Al-Mamary, et. al., (2013), Wixom and Todd 2005) that demonstrated a strong association between information quality and HRIS use. Al-khowaiter et al (2013) also showed the correlation between the information quality dimension and the satisfaction of the users in the large organization settings.

However, some studies have reported findings quite opposite to those of this study. McGill et al. (2003) showed that there is a weak association between information quality and HRIS use. Ivaris (2005) showed similar results to those of McGill and his colleagues pertaining to the association between information quality and user satisfaction. Marble (2003) reported that there is a marginal link between information quality and user satisfaction. The variations in the findings of this study from those of other studies may be as a result of the data analysis techniques or the availability of highly refined information to HRIS users in the other studies. Therefore, those studies did not report a clear-cut link between user satisfaction, HRIS use and information quality.

In the nutshell, the findings of this study show that information quality is an important indicator of user satisfaction and the use of HRIS. This reflects the fact that information quality increases the net benefit in terms of increasing HRIS productivity, efficiency and performance for the Saudi public universities. It does this through the mechanisms of increasing the use of HRIS and user satisfaction with HRIS within Saudi universities.

9.4. The Impact of Service Quality on HRIS Use and user satisfaction

It was hypothesised that service quality has a positive influence on HRIS use and user satisfaction. This study supported the hypothesis that service quality is positively correlated with user satisfaction ($\beta = 0.209$). However, the hypothesis concerning the positive link between service quality and HRIS use was rejected ($p > 0.05$). The interesting finding showed by the current study is that there is no significant relationship between the service quality and the HRIS, which is consistent with the results reported by Petter et al. (2009). They performed met-analysis of 26 studies, and showed that none of them supported the positive association between the HRIS use and the service quality. Similarly, the outcomes demonstrated by the studies of Halawi et al. (2007) and Jing, G. and Yoo, (2013), showing that there is no significant relationship between the service quality and the HRIS use.

Unlike the finding of this study, a strong correlation between HRIS use and service quality was reported by several other studies (Al-khuwaiter et al., 2013; Fitzgerald and Russo, 2005; Calderi and Ward, 2002, Al-Shibly 2014), while it was marginally supported by that of Wang and Liao (2008). Similarly, the service quality was shown to be significantly associated with the HRIS use by the study of Wang and Liao (2006). This is not consistent with the findings reported by our study, which might be related to different industrial setting and cultural parameters in specific organization. This may be associated with different level of user's training, education and experience with HRIS, which either weaken or strengthen the association between the service quality and the use of HRIS.

In agreement with the finding of our study, Jing and Yoo, (2013) demonstrated no link between HRIS use and service quality. Similarly, the positive relationship between service quality and user satisfaction, as found by this study, is supported by several other studies (Halawi et al. 2007, Shaw et al. 2002, Al-Shibly 2014, Wang and Liao 2008, indicating the strength of the findings of this study.

However, some studies reported different results compared to those shown by this study (Chui et al. 2007, Marble 2003, Aladwani 2002). After careful study of the literature, these variations can be ascribed to differences in the sectors of HRIS implementation or to different IS applications being tested for use, as the current study has focused only on those applications that are routinely used within HR Departments of public universities in the KSA. Most of the studies conducted in this context corroborated the outcome of the present study.

However, service quality affected user satisfaction significantly in this study, showing that timeliness and completeness are major factors that affect user satisfaction (Anitha and Aruna 2014). In the qualitative phase of this study, it was shown that the users (participants) were concerned about the timeliness, completeness and accuracy of the services provided by HRIS applications within HR Departments in public universities. Based on these concerns, the findings from both the quantitative and qualitative phases of this study carry a great significance for HR managers in Saudi universities by urging

the streamlining of HRIS functions. This will ensure better quality services to HRIS users within HR Departments in accordance with user requirements, thereby enhancing user satisfaction.

The service quality is an important mediator for enhancing the net benefit for the public universities of Saudi Arabia by increasing the use of HRIS and user satisfaction. This means that the net productivity, efficiency and performance of the HR Departments within Saudi public universities can be enhanced by increasing the service quality of the system. In addition, service quality can be enhanced by increasing the reliability, validity and robustness of the information provided by HRIS to the users.

9.5. The Impact of HRIS Use and User Satisfaction

As expected, user satisfaction had a significant influence on HRIS use in this study, and HRIS use influenced user satisfaction as well. Thus, H2 was supported ($p < 0.05$). The increased user satisfaction brings about increased HRIS use and vice versa. HRIS use and user satisfaction are considered to be valuable proxy measures for discerning HRIS success (Al-Shibly 2014, Bailey and Pearson 1983, Doll and Torkzadeh 1998). This means that increased user satisfaction leads to a higher level of use of the system. A high level of HRIS use correlates with greater effectiveness of the system. Therefore, this study suggests that system usage and user satisfaction are invariably related to each other, and that users' satisfaction is linked to the effectiveness of the HRIS for the HR Departments of public universities in Saudi Arabia.

It can be noted that the studies reporting a non-significant relationship between user satisfaction and HRIS use were carried out in mandatory settings. However, in voluntary and mandatory settings where rewards are used as motivators, user satisfaction leads to enhanced usage of HRIS (Kim et al. 2002, Rai et al. 2002).

However, this finding was not supported by a study carried out by Seddon and Kiew in the Australian context. The difference may have arisen because they used a partial test to validate the DeLone and McLean model, which is likely to have affected the outcome of the relationship. Moreover, participants in the qualitative phase of the study also commented on the relationship between user satisfaction and HRIS use.

Although, the continues HRIS system usage have positive impact on the organisation and it will enable the organisation to achieve its goals effectively and efficiently such as in employee selection process, better decision making process, better future planning, better management of training and development performance, improve work scheduling, better salary planning and help to establish easy communication among the universities department, yet, any glitch on the HRIS will affect the effectiveness and the efficiency of the organisation activities such as longer time required to carry a task, poor decision making process etc. based on this study results.

Based on the findings, it can be argued that the lack of attention to either HRIS use or user satisfaction can cause disastrous consequences for the performance of HR Departments in Saudi public universities. Furthermore, the strong positive correlation between user satisfaction and organisational impact mandates that concerned HR managers in the public universities of Saudi Arabia should increase the user satisfaction dimension by providing training and knowledge about the impact of HRIS. Consequently, this could increase the system usage within the HR Departments of the concerned universities.

Taken together, both system usage and user satisfaction can result in enhancing the organisational impact for public universities in Saudi Arabia. The managers are required to increase the use and user satisfaction constructs simultaneously; this will in turn increase the HRIS net benefit in terms of increasing productivity, efficiency and performance of HR Departments within Saudi universities.

10. Conclusion

The findings of this research offer a number of practical applications for Saudi public universities and for the government of Saudi Arabia to improve HRIS use and to improve organisational performance.

1. A very important construct – that of subjective norms – was incorporated into the existing model of DeLone and McLean.
2. The service quality should be improved to increase the efficiency of HRIS function within organization.
3. System quality has significant impact on the use of HRIS within HR departments of public universities in Saudi Arabia.
4. One of the major reasons that organisations act reluctantly to implement HRIS is that they are not fully convinced of the practical benefits, or there is insufficient capital to deploy system requirements.
5. Part of the challenge for Saudi public universities is the uneven implementation of HRIS applications across different departments of the same universities.
6. The university leaders need to make use of the funding dedicated to HRIS by improving information, systems and service quality. The quality-related dimensions should be improved by taking into consideration the feedback of users, HRIS performance evaluations and examinations of the acceptance levels of HRIS users.
7. The HRIS use model proposed by this study offers a comprehensive solution for dealing with delayed services to the members of Saudi Universities.

11. Directions for Future Research

1. This study was conducted in public universities in Saudi Arabia, therefore, it is recommended that subsequent research related to HRIS be conducted in private universities and different government institutions to gain a perspective on those institutions and to balance the limitations that exist.
2. This study sample included only males, according to the Saudi regulations, so I recommend that researchers conduct a similar study on female universities, such as Norah University in Riyadh.
3. Since this is the first study that includes the dimension of subjective norm and extends the DeLone and McLean model, we recommend that this dimension be investigated in further studies, especially its impact on usage and user satisfaction. In doing so, wider knowledge and a more argumentative perspective can be created for the model, the HRIS impact and user satisfaction.
4. Since this study was the first to use mixed methods in Saudi Arabia, further research should carry out research using a mixed method in other Middle East countries. Such research could also test the updated model from the findings of this research, with the addition of subjective norm to the DeLone and McLean model (2003).

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