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Bernard Muturi, Abraham Kiflemariam, Freddie Acosta

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Towards a Robust Human Resource Information System's Success Measurement Model

Bernard Muturi

Catholic University of Eastern Africa, Kenya
Email: bmuturi@cuea.edu

Dr. Abraham Kiflemariam

Catholic University of Eastern Africa, Kenya
Email: kifabraham@yahoo.com

Dr. Freddie Acosta

Strathmore University, Kenya
Email: facosta@strathmore.edu

Abstract

Human Resource Information System (HRIS) is a technological innovation that is transforming the Human Resource (HR) department from a record-keeping and clerical unit into a strategic function. The purpose of the study is to review the IS and HRIS success models, and identify key gaps that researchers can focus on in order to formulate a robust HRIS' success model. The study found out that there is lack of consensus in the constructs used in the IS and HRIS-success measurement whereby different IS and HRIS models have different success measures. It concluded that there isn't yet a model explaining comprehensively how the success of HRIS can be adequately measured. The study recommends that HR researchers should formulate a robust and widely accepted HRIS-success model. The study has proposed a HRIS-success measurement model that HR researchers and practitioners will find useful in assessing the HRIS success in an organization.

Keywords: Human Resources Management (HRM), Human Resources (HR), Human Resource Information System (HRIS), Information System (IS), IS-Success Model, and Information Technology (IT).

Introduction

Human Resources are the most important asset of any organization simply because they manage the other factors of production such as land, capital, entrepreneurship, and most interestingly, people manage people, that is labour which is also a factor of production (Armstrong, 2014).

Human Resource Management is therefore very important since it is the strategic approach through which people in the organizations are managed, who in turn manage the other resources (Armstrong, 2012). HRM has been difficult when HRIS had not been invented (Chugh, 2014). HR staff including managers, had to spend a lot of time in administrative tasks and generation of reports, which added very little value to the organization (Ünal & Mete, 2012). There were also problems of data inaccuracy resulting to less informed decisions by the management (Daulat & Patil, 2013). The manual record keeping methods were cumbersome and it would take so long to retrieve documents (Singh et al., 2011). Top management would wait for hours in order to get basic staff statistics as opposed to the present where they get almost every piece of information on the HRIS dashboard, without calling the HR manager.

The introduction of HRIS has therefore transformed Human resource management (Kumar & Parumasur, 2013). HRIS has become a very strategic tool in managing human resources and its benefits are numerous (Rasmussen et al., 2010). Sadiq et al., (2012) defines HRIS is an integrated tool that gives an opportunity for HR practitioners to participative meaningfully in the operations of the organizations, by helping management to make transformative decisions. HRIS contributes to organizational success through effective records management, data accuracy, proper cost management, proper time management, skill management, strategic HR planning, employee benefits administration, employee self-service, better and more informed decisions and better staff performance management hence improved productivity, among others. (Ankrah & Sokro, 2012; Kumar & Parumasur, 2013).

Many organizations are therefore investing in HRIS. However, the top management would want to be convinced that they will reap considerable benefits from this investment, which is a costly undertaking. This is why researchers have gone out of their way to try and demonstrate how to measure the impact of IS and HRIS including DeLone and McLean (1992), DeLone and McLean (2003), Gable et al. (2008), Alshibly (2011), Hashim et al., (2013) and Alshibly (2014) among others. Organizations are now moving from the traditional measures of IS such as return on investment, to IS success models, which focus on comprehensive success metrics (Petter et al., 2008).

Objectives of the Study

This study focuses on the success of HRIS and intends to achieve the following objectives:

- i. To review literature related to the assessment of the success of HRIS.
- ii. To identify the major gaps in related IS and HRIS success models.

Study Approach and Methodology

The study adopted two approaches namely: thematic reviews which were used to organize different studies around different topics, and theoretical reviews for comparing how different models applied various constructs related to this study.

Literature Review

This study has reviewed three (3) IS models and three (3) HRIS models. The three IS models include: DeLone and McLean (1992) IS Success Model, Updated DeLone and McLean (2003) IS Success Model and IS-Impact Measurement Model by Gable et al. (2008). The three (3) HRIS

models include: HRIS Evaluation Hypothesized Model by Hashim et al. (2013); Integrated HRIS success model by Al Shibly (2011) and E-HRM success evaluation model by Alshibly (2014).

Information Systems (IS) Models

DeLone and McLean IS Success Model

This was formulated by DeLone and McLean (1992) with an aim of coming up with a measurable dependent variable for IS success. According to this model, success of IS can be measured using six dimensions which are interrelated and interdependent, namely: system quality, information quality, use, user satisfaction, individual impact and organizational impact (See Figure 1).

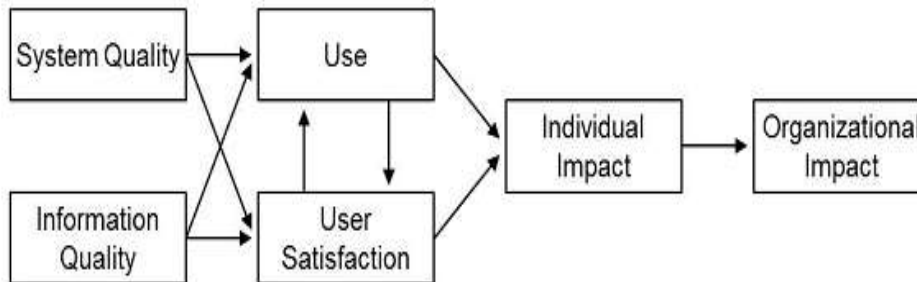


Figure 1: DeLone and McLean (1992) IS success Model

Though some scholars validated the DeLone and McLean IS Success Model of 1992, others critiqued it. Rai et al. (2002) validated the model by operationalizing key IS success constructs and testing the relationships between the measures and found out that the model has the power and merit for explaining IS success. However, Seddon and Kiew (1996) critiqued the model arguing that the success construct that researchers have been struggling to measure is not 'Use' but 'Usefulness'.

Another very important critique to the model was advanced by Pitt et al. (1995) who claimed that the IS success model mainly focused on the products and neglected the services. They argued that there was a possibility of not coming up with accurate measurements of IS Success if such models do not include a measure of IS service quality. They therefore proposed and tested the inclusion of service quality as a construct in the DeLone and McLean IS Success Model. In their augmented IS model, just like system quality and information quality, service quality affected both use and user satisfaction.

Updated DeLone and McLean IS success Model

DeLone and McLean IS Success Model of 1992 was updated by the same theorists ten years after, incorporating ideas from other researchers who had tried to apply, validate, challenge, and propose modifications to the original model (DeLone and McLean, 2003). The new model captured some of these proposals, resulting to the following measures of IS success: System Quality, Information Quality, Service Quality, System Use (which includes intention to use and actual use), User Satisfaction and Net Benefits as shown in figure 2 (Petter et al. 2008).

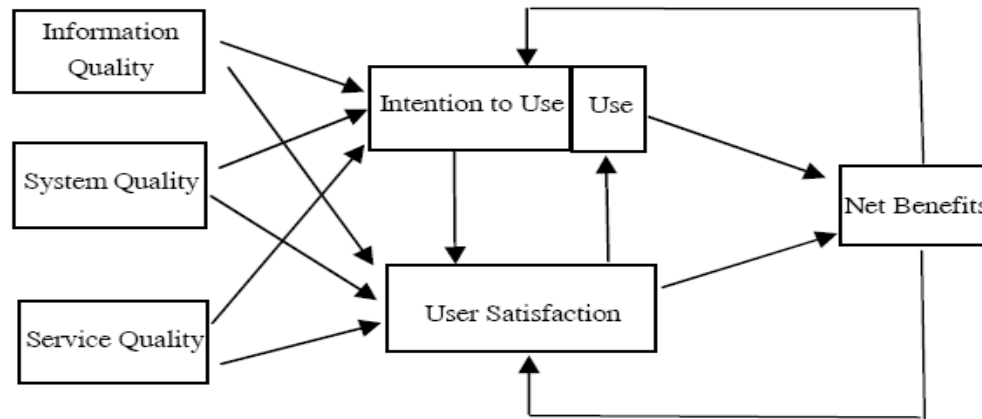


Figure 2: The updated DeLone and McLean (2003) IS Model

Some of the key researchers whose proposed modifications were accepted and incorporated in the updated DeLone and McLean (2003) IS model include Pitt et al. (1995) who had suggested the inclusion of Service quality. The contributions of Seddon et al. (1999) were also added to the new model, who had argued that the information systems affect a wider society such as workgroups, industries and the society at large and not just the individuals and organizations hence 'Net Benefits' construct.

The updated DeLone and McLean's IS Success Model (2003) was validated and even modified by different scholars. For instance, Pérez-Mira (2010) carried out a study that supported DeLone and McLean Model of IS Success though it did not support the relationship between information quality, system quality, service quality and satisfaction; and also satisfaction and net benefits. Wong (2011) proposed revision to the DeLone and McLean's IS Success Model by introducing adaptability as a construct arguing that the model was meant to measure success of IS in a stable environment. Gable et al. (2008) also critiqued this model stating that 'Use' of IS and 'User satisfaction' were not measures of IS impact and vehemently refuted the causal relationship.

IS-Impact Measurement Model

The IS-Impact Measurement Model was formulated by Gable et al. (2008). This model has four measures of IS impact namely: System Quality, Information Quality, Individual Impact, and Organizational Impact (See figure 3). This model consolidates and extends earlier ideas of Sedera et al. (2003), Gable et al. (2003) and Sedera & Gable (2004). The model is based on DeLone and McLean IS success model though it differed with the concepts 'Use' and 'User satisfaction' and therefore did not include them as part of IS-impact measurement.

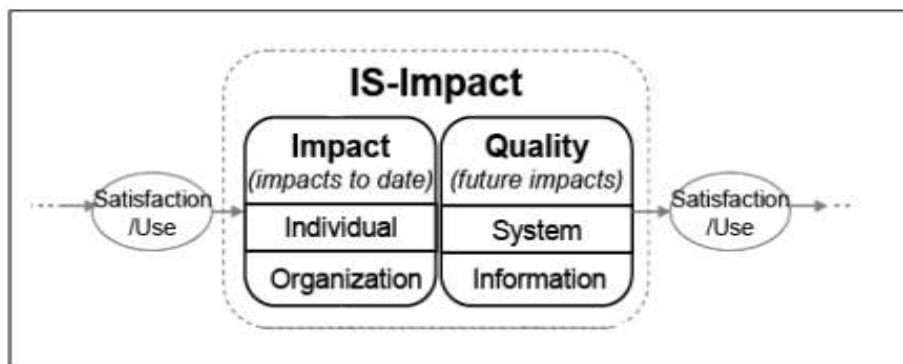


Figure 3: The IS-Impact Measurement (Gable et al., 2008)

The four dimensions in this model are presented in two halves namely: the “Impact” half which measures the net benefits to date (Individual and Organizational Impact) and the “Quality” half which contains System Quality and Information Quality which can be used to measure future impacts. According to Gable et al. (2008), ‘Quality’ of an information system is the best predictor of its future benefits emphasizing that employing both backward looking (impacts), and forward looking (quality) constructs is a holistic approach for evaluating IS-Impact.

Attempts have been made to validate the IS-impact model. A validation study by Cao and Elias (2009) showed that most of IS-Impact measures are applicable in China and Malaysia. However, the respondents suggested new measures which included: System usage, better resource management, overall management improvement and System security. In another study which was seeking to assess the impact of e-learning systems on learners, Alkhalaf et al. (2012) observed that the IS Impact model was the most useful model for measuring the individual impact of e-learning system.

Human Resources Information Systems (HRIS) Models

Integrated HRIS success model

Al Shibly (2011) formulated and tested an integrated HRIS success model having borrowed most of the constructs from TAM (Technology Acceptance Model), DeLone and McLean (1992) IS success model and the updated DeLone and McLean (2003) IS success model. In this model, just like in DeLone and McLean IS success models, system quality and information quality affects HRIS user satisfaction which in turn influences HRIS success (See figure 4). Borrowing from TAM, perceived HRIS ease of use and perceived HRIS usefulness have an impact on user satisfaction which affects HRIS success.

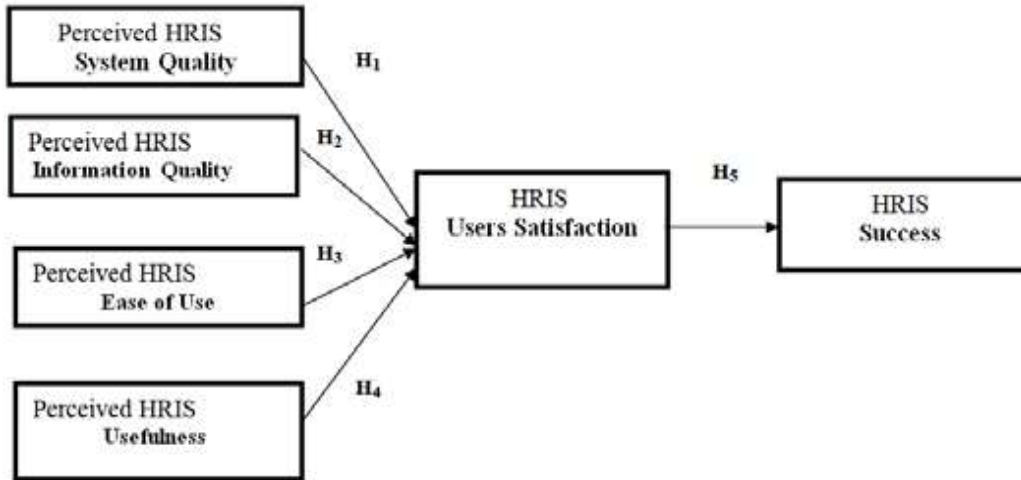


Figure 4: Integrated HRIS success model (Al Shibly, 2011)

It can be noted that though this was a step in the right direction, the model missed out major constructs such as service quality, individual impact and organizational impact. The model also included HRIS user satisfaction as a HRIS success measure which had been contested by scholars such as Gable et al. (2008).

HRIS Evaluation Hypothesized Model

After reviewing a number of IS models, Hashim et al. (2013) hypothesized a model of HRIS evaluation (See figure 6). This model borrowed heavily from the constructs of TAM2, but went a step further to include productivity and efficiency as the ultimate goal of HRIS as opposed to TAM2 which had usage behavior as the final aim of information systems.

According to Hashim et al. (2013), HRIS enables Productivity and Efficiency in HRM and in the entire organization. Through HRIS, employees are able to access and maintain their personal data online through Employee Self-Service (ESS). The top and line managers are also able to access important HR information such as salary administration and performance management among others through Managerial Self-Service (MSS) applications.

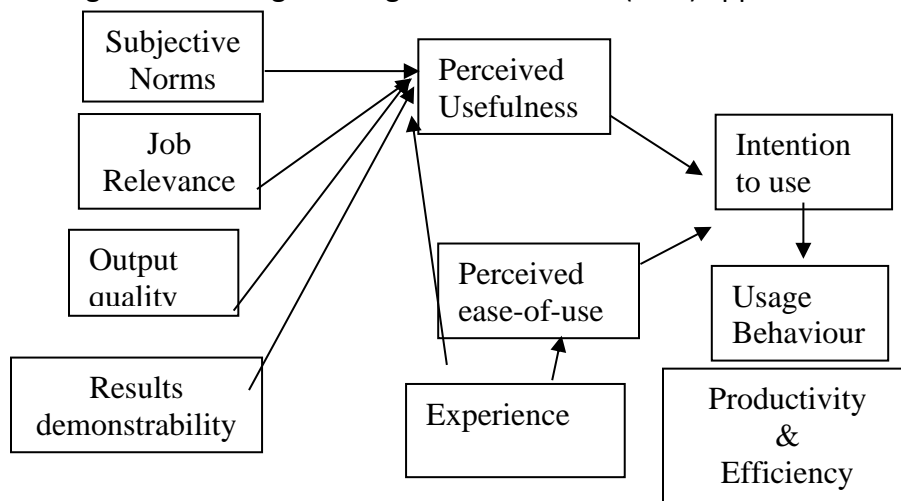


Figure 6: HRIS Evaluation Hypothesized Model (Hashim et al. 2013)

This model is however not adequate as HRIS success model since it does not have clear measures of HRIS as the independent variable. Nevertheless, it makes an important contribution in the sense that HRIS results to increased organizational productivity and efficiency.

E-HRM Success Evaluation Model

According to Al-shibly (2014), Electronic HRM (E-HRM) success evaluation model was the first empirical test of the updated DeLone and McLean (2003) IS success model in an e-HRM context. Just like the DeLone and McLean (2003), the model consisted of six dimensions: information quality, system quality, service quality, use, user satisfaction, and perceived net benefit (See figure 6).

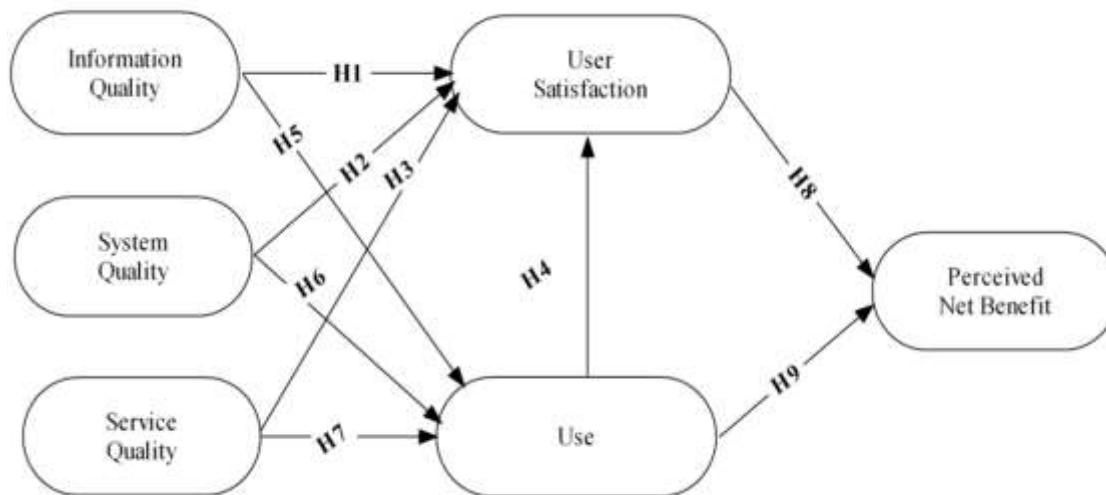


Figure 6: E-HRM success evaluation model (Alshibly, 2014)

However, though this model has four important constructs (systems quality, information quality, service quality and net benefits), the other two (user satisfaction and use) have been rejected by some scholars such as Gable et al. (2008), arguing that they are not measures of IS-impact.

Findings and Discussions

One of the major findings of this study is that the most widely applied and most popular IS model is the DeLone and McLean IS success Model. By the time of this study, the DeLone and McLean article that published this model in 1992 had been cited 10,633 times whereas the Delone and McLean article of 2003 which published the updated IS model had been cited 8,318 times as indicated on the Google scholar webpage. This shows how popular the model is amongst the scholars. The reason for this popularity could be that it was one of the first most comprehensive and convincing IS success model. Before this model, there was no clear IS success dependent variable. This explains why the study of DeLone and McLean (1992) was about “the quest for a dependent variable.” The models that tried to explained IS success there before were not parsimonious enough and most of them were attempting to measure IS success in terms of ‘system usage’ and ‘user satisfaction’. This raised a question if the ultimate goal of an information

system is usage or user satisfaction. The other reason could be that this model has been widely validated by others scholars hence making new researchers more comfortable with it.

The second very important finding of this study is that in all the IS and HRIS-success models, there is lack of consensus on the measures of IS success. Delone and McLean (1992) had six constructs, Delone and McLean (2003) also maintained six dimensions whereas Gable et al. (2008) had four constructs. Service quality as a measure IS success has been contended by key IS theorists such as Gable et al. (2008), who did not include it in the IS-impact measurement model. Other scholars who validated these IS-models either modified or added more constructs. These scholars include Pitt et al. (1995) and Seddon and Kiew (1996). The HRIS success models also exhibit the same lack of consensus in the measures, including Al shibly (2011), Hashim et al. (2013) and Al shibly (2014), majorly because they were founded on the same IS-models.

The addition of service quality as a measure by Delone and McLean (2003) was a step in the right direction. This is because no IT systems can succeed without technical support to the users. Therefore, the quality of the service offered by the IT staff in terms of responsiveness, accuracy and reliability, should be considered as an important measure of the information system itself. However, a few years after, Gable et al (2008) decided not to include it in the IS-impact measurement model. This is an indication that the debate is still on. The HR researchers of the 21st century need to clearly demonstrate how to accurately measure the independent and the dependent variables relating to HRIS-success since this issue remains unsettled.

This study has also revealed that there is no single IS or HRIS model that can claim to have the completeness such that it can exclusively and adequately measure the success of IS/HRIS. Most of the scholars, who have tried to validate any of the models, have ended up extending the model. Such researchers include Seddon et al. (1999), Cao and Elias (2009) and Wong (2011). This is a vivid evidence that there is still a need to formulate a model capable of measuring all the aspect of IS/HRIS success. A major research gap is therefore presented to scholars who may want to come up with a single universally accepted IS model that can claim monopoly in measuring IS/HRIS-success. Petter et al. (2008) agrees with this finding appealing that researchers should continue working hard in order to formulate a “comprehensive, replicable, and informative measures of IS success”.

When it comes to HRIS-success models, the study found out that there isn't yet a model explaining comprehensively how the success of HRIS can be effectively measured. Alshibly (2011) formulated the Integrated HRIS success model but since it was based on DeLone and McLean (2003) IS success model, it inherited one of its main weaknesses of using 'usage' and 'user satisfaction' as measures of IS success. The other model was the HRIS Evaluation Hypothesized Model by Hashim et al. (2013) which carried forward some of the weaknesses of TAM2 in that it does not have clear measures of HRIS as the independent variable. Finally, Alshibly (2014) came up with the E-HRM success evaluation model and since it was based on Delone and McLean (2003) IS model, it contained two constructs ('user satisfaction' and 'use') which have been contended by some scholars such as Gable et al. (2008), arguing that they are not measures of IS-impact. 'Net benefits' is also a very wide concept. HR researchers have therefore, a huge task of developing a robust and widely validated HRIS success measurement model since as the study shows, there isn't such a model yet.

Lack of a robust HRIS-success measurement model in the HR field raises very many questions. As we all know, technology is not cheap. Organizations invest millions of money in order to have

working HRIS with an aim of enhancing their effectiveness and efficiency, hence making them more competitive. If there is no way of assessing their impact in an organization, it means that the management cannot really measure the value such systems add. This may explain why the managers in the developing countries are very hesitant and slow in adopting technology, asking themselves if it is worth the cost. However, with the attempts made by Alshibly (2011); Hashim et al. (2013) and Alshibly (2014), there seem to be some light at the end of the tunnel. This also explains why, this study has proposed a HRIS-success model, with an attempt to fill in the gap.

Conclusion and Recommendations

In line with its objectives, this study has reviewed literature related to the success of IS and HRIS and therefore makes the following conclusions and recommendations. First, it is evident that the debate on how to measure the success of IS and HRIS is still on with different researchers coming up with different models. However, it is very clear that the HR managers who want to become business partners with the rest of the managers in the organization and especially with the top management do not have much choice but to fully implement HRIS and be able to measure its impact. This will ensure that the managers and other HR practitioners in the organization can have more time to focus on other value adding HR activities such as coaching, and supporting functional managers with their HR expertise (which sometimes is not felt due to lack of adequate time with the line managers).

Adopting HRIS in the management of the most valued asset in the organizations (the people), will also provide useful, accurate and timely information to the HR managers which can be used to make informed and prompt decisions. HRIS is also useful to the line managers since they can obtain information about their staff members directly (without calling the HR department) and can use this to make various functional decisions and even to plan and budget for their departments. The top management can also access HRIS and are therefore able to get summarized reports in their dashboard about the employees and the related aspects. This will help them in strategic decision making which will certainly give the organization an edge over their competitors.

Secondly, there is lack of consensus on the constructs that have been used to measure the success of IS and HRIS. Different models have adopted different constructs whether it's Delone and McLean (1992), Delone and McLean (2003), Gable et al. (2008), Al shibly (2011), Hashim et al. (2013) or Al shibly (2014). Whereas there seems to have been some key measures that have not been in dispute, there has been a tendency of coming up with more measures instead on focusing on the most agreeable ones. Even those who have attempted to validate the models have not focused on bringing together the undisputed constructs and instead most of them have ended up extending them yielding more constructs.

Lastly, the study has found out there is no universally accepted model for measuring the success of HRIS in an organization. However, the studies that have been reviewed have made considerable contribution towards this goal and they mark the starting point for a more scientific, rigorous and parsimonious approach towards measuring the impact of HRIS. This explains why this study has proposed a HRIS success measurement model that can be used to assess the impact of HRIS in an organization. Researchers interested in this area can conduct studies to validate this model. They can also apply it in order to measure the success of HRIS in an organization including

the performance of the HR function, performance management, training, recruitment, and employee communication among others.

This study has made a number of recommendations: Firstly, the study recommends that in general, IS researchers should develop a single universally accepted IS model that can claim monopoly in measuring IS-success since no single IS model has the completeness to exclusively and adequately measure the impact of IS. More specifically, HR researchers should formulate a robust and widely validated HRIS success measurement model since as the study shows, there isn't such a model yet. The HR practitioners and HR researchers should work hand in hand to achieve this objective.

Secondly, HR researchers and practitioners should conduct joint research and agree on the main constructs that are needed to precisely measure the success of HRIS. They therefore have an opportunity to bridge the enormous gap that has existed in the IS models by proposing clear constructs that can be used as independent and dependent variables in the study of HRIS-success. This should bring consensus on the IS-success measurement constructs hence clearing the clouds of disharmony in the measures of HRIS-impact that has haunted the scholars in the past.

Thirdly, the HR Managers in the developing countries should take advantage of the many HRIS studies that are being carried out and learn from the abundant information provided through these studies. This readily available information that clearly enumerate the numerous benefits that HRIS offers, should persuade these HR Managers and the rest of the management teams to implement suitable HRIS for improved organizational performance. The HR managers should also take a leading role in using the proposed model to assess the benefits of HRIS in order to provide the management with tangible evidence of the HRIS's value addition in the organization.

Proposed HRIS-Success measurement model

From the literature review that has been done in this study, a model is hereby proposed to measure the success of HRIS. In the proposed HRIS success measurement Model, HRIS is the independent variable and will be measured in terms of HRIS Quality, HRIS information Quality and HRIS Service Quality whereas Organizational Performance is the dependent variable mediated by Individual Performance (See figure 7).

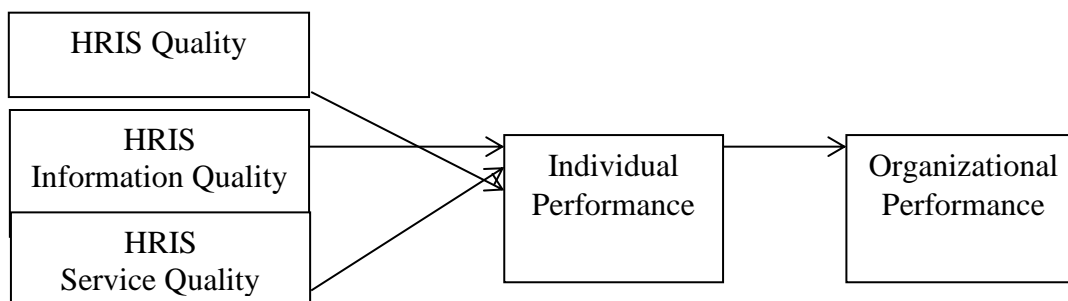


Figure 7: Proposed HRIS' Success Measurement Model (Author, 2017)

Operationalization of the Proposed Model

The proposed HRIS success measurement model has 5 constructs namely HRIS Quality, HRIS Information Quality, HRIS Service Quality, Individual Performance and Organizational Performance. The constructs are operationalised as follows.

HRIS Quality

System Quality is the required features of an information system and the measures include ease of use, system flexibility, system reliability, ease of learning, sophistication, and response times (Petter et al., 2008).

HRIS Information Quality

It includes the required features of the system outputs (management reports and web pages) and is measured in terms of relevance, understandability, accuracy, conciseness, completeness, understandability, currency, timeliness, and usability (Petter et al., 2008).

HRIS Service Quality

Service Quality refers to the quality of the support that end users receive from the IT department and is measured in terms of responsiveness, accuracy, reliability, technical competence, and empathy of the personnel staff (Petter et al. 2008).

Impact on Individual Employee

This refers to the effect of information on the behavior of the user and relates to how the system influences the recipient's experiences. (Petter et al. 2008). The measures may include:

- a) **Task performance** - which refers to "the proficiency with which an employee performs central job tasks" with such indicators as quality of work, efficiency, quality of decisions and individual productivity (Koopmans et al. 2014; Gable et al. 2008).
- b) **Contextual performance** - referring to "employee behaviors that support the organizational, social, and psychological environment in which the central job tasks are performed" and includes indicators such as communicating effectively, being customer oriented, being creative, self-confidence (Koopmans et al. 2014)
- c) **Adaptive performance** - which means "an employee's proficiency in adapting to changes in work-roles or environment" with indicators like showing resilience, coming up with creative solutions and learning new tasks (Koopmans et al. 2014).
- d) **Counterproductive work behavior** - which is a "behavior that is harmful to the well-being of the organization" and includes indicators like displaying excessive negativity (for example complaining), doing things that harm your organization such as not following rules, leaving work for others to finish and purposely making mistakes (Koopmans et al. 2014).

Impact on Organizational Performance

This is the effect of information on organizational performance, whose measures may include revenue growth/profitability, cost-reduction and asset efficiency (Applegate, 2008; DeLone and McLean, 2003; Gable et al, 2008; Kharuddin et al., 2010).

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