THE MEDIATING EFFECT OF BEHAVIOUR INTENTION BETWEEN THE STRATEGIC SUPPORT AND BEHAVIOUR ADOPTION

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ABSTRACT: *The purpose of this study was to establish if strategic support has effects on the user acceptance model on E-health systems adoption among nurses in the public hospitals in Kenya. The objectives of the study were to determine the effects of strategic support on the E-health systems and adoptions by nurses in public hospitals, the second objective was to determine the mediating effects of behaviour intentions on E-health systems adoptions by nurses in public hospitals. The study adopted explanatory survey design targeting all nurses. The muti-stage sampling method was used. The data collection instruments used were structured questionnaires. The instrument was tested for reliability and validity before full data collection was done. The results indicated that the strategic support significantly mediated the relationship between the behaviour intentions and the adoption (behaviour usage) (β=0.029, p>0.05).The regression results indicated that strategic support (β=0.149, p>0.05) had significant relationship to adoption (behaviour usage). Further, the study recommends that the strategic support mediate between the behavior intention and the adoption (behavior usage). There is further need to review the Venkatesh (2003) model and technology adoption theories to understand better the strategic support in adoption of technology in other E-government initiatives.*

KEYWORDS: E-health, strategic support, behaviour intention.

INTRODUCTION

The Kenya government has introduced the IFMIS payment platform and currently the government is introducing laptops in early schools to address service delivery in primary schools. Therefore, the current support in the introduction of E-health is envisaged to address concerns in the health sectors too.

However, this can only be realised if the E-health introduced by government through AMREF is adopted by the healthcare staff in public hospitals. Therefore, a need to study the strategic support as a determinant of E-health adoption in public hospitals. The introduction of technology in the management of health will re-engineer the strategic change management. This is envisaged to share the limited skills in the public health nationally and help to address service quality delivery in the remote parts of the country.

Background

E-health systems is an emerging information and Communication technology application in the healthcare industry; E-health systems has slow technology diffusion in both developed and developing countries. It has been widely accepted that the use of IT/IS in the health care sector and especially in hospitals offers great potential for improving the quality of services provided, the efficiency and effectiveness of the personnel, and also reduces the organizational expenses (Scott *et al.,* 2007). Researchers have predicted that hospitals that don't adopt new

information's systems may become inefficient and lose the trust of the patients (Ammeriwerth *et al.,* 2003 & Xiao *et al.,* 2005). For this reason, Hospital Information Systems (HIS) have gradually taken over traditional hospital operation procedures (Croll & Croll, 2007 & Sucrovic, 2007).

Technology acceptance research was considered as a mature field in information systems research (Venkateh *et al.,* 2003), with many models and theories developed and tested. However, despite the large volume of work in this area, very little research has been done in the healthcare context, more so in the developing countries, indicating a significant gap in knowledge. Not surprising, there was a strong current need to develop and gain empirical support for models facilitating technology acceptance within health organization (Kidd *et al.,* 1999). One of the most notable and well-established streams of research in Information System (IS) over the four decades has been focused on how and why people adopt information technology (Willis *et al.,* 2008).

The best model that explained adoption of E-Health systems by medical personnel was the Unified Theory of Acceptance and Use of Technology (UTAUT) model (Venkatesh *et al.,* 2003). The other models that have been used are Technology Acceptance Model (TAM) (Davis, 1989; Davis *et al.*, 1989). Roger's Innovation Diffusion Theory (IDT) (Rogers, 1995), Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975). The Motivation Model (MM), (Davis *et al.,* 1992). Theory of Planned Behaviour (TPB), (Ajzen, 1991). The combined TAM and TPB (Taylor & Todd, 1995), the Model of PC Utilization (MPCU) (Thompson *et al.,* 1995; Triassis, 1977) and the Social Cognitive Theory (Bandura, 1986, Compeau & Higgins, 1991; Compeau & Higgins, 1995b; Compeau *et al.,* 1999).

The objectives of the study were to determine the effects of social norm on the E-health systems and adoptions by nurses in public hospitals, the second objective was to determine the mediating effects of behaviour intentions between the strategic support and adoption by nurses in public hospital. The two hypothesis were strategic support have no significant relationship with the E-health systems adoption (behaviour usage). The second hypothesis was Behaviour intentions mediates the relationship between strategic support and E-health systems adoptions (behaviour usage). The study used the advance theory of Unified Theory of Acceptance and Use of Technology.

This research was relevant to the developing countries because there are constraints in the trained medical personnel and there were limited resources available to support the growing population in the developing countries (Ivatury *et al.,* 2009).

LITERATURE

The Adoption (Behaviour Usage)

The Adoption construct can't be measured directly, however it can be done through study on adoption (Behaviour usage) was a multidimensional concept and the relationship between E-health and adoption might depend upon the indicators used to assess behaviour usage (Venkatesh, 2000). Empirical literature reports a high diversity of behaviour usage indicators (King & He, 2006; Wang & Liao, 2008; Gotoh *et al.,* 2009). A common distinction is made between frequency of use and length of usage. Behaviour usage measures includes goals such as satisfaction after usage and quality service by the users. Adoption (Behaviour usage)

measures included assessment of factors such as acceptance factors, actual usage and perceptions of use (Venkatesh & Davis, 2000).

In previous studies, adoption was used as a proxy for technology usage (Ajzen, 1995; Venkatesh, 2003:2008). However, given that behaviour usage and adoptions were driven by different factors, the behaviour intentions of the users was observed to be a major factor in adoption and continuance of use according to Venkatesh (2003).

With these expected benefits of E-health, hundreds of projects have been proposed and are being undertaken according to study done by (Labrique *et al.,* 2013). However, this "unfettered proliferation of E-health solutions" (Labrique, *et al.,* 2013) has failed to meet expectations. Reports from studies have shown a lot of failures of implementation and adoptions of E-health projects by users, (Labrique *et al,* 2013).

The reported challenges for failures of the E-health projects are the legislations, conflicts among the stakeholders and technological limitations. However, focusing on technological advances is not sufficient to ensure the success of E-health but users' perception, attitude and behaviours usage (adoption) should be understood because many innovative services that have not been perceived to provide superior benefits and relative advantages have not been successful in the market (Schuster *et al.,* 2013). Studies have reported mixed results concerning the introduction of E-health, the service providers are not sure how to introduce E-health to the market (PwC, 2013). The focus has been to introduce high technology from a provider-oriented perspective, rather than a user-oriented and not to have a consumer-centric model (PwC, 2013).

The Strategic Support

The government policies referred to the ICT and health policies, strategies, E-legislation, the legislation on confidentiality of data and ethics, E-health standards, E-health infrastructure and ICT capacity. Information policy was a guideline that ensures the achievement of universal information for the development of a particular country (Pajaro & Betancourt, 2007a:23). Jaeger (2007:841) asserts that information policy was a combination of law, rules and guidelines that determine or control management of information in a community. Maxwell (2003b:7) had a different view that information policy was a result of social development, politics, law, economy and technology relevant to the role of information in the community. The information policy could not be separated from the political and social context (Rowlands, 1996:15) however for the study, we explored the effects of the Strategic Support on the implementation.

The Behaviors Intention

The few research studies in the field of E-Health examined the factors influencing behavioural intention. They all used various generic behavioural intention models and only one study used the UTAUT model in a developing country context. Kijsanayotin *et al., (*2009) recent study using the UTAUT model (Venkatesh *et al*., 2003) was a study conducted in Thailand (Kijsanayotin *et al.,* 2009). This study surveyed the personnel of community health centres in Thailand for administrative uses of healthcare IT.

In the field of technology adoption research, researchers had used conventional theories; Innovation Diffusion Theory (IDT) (Rogers, 1962), Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975), Theory of Planned Behaviour (TPB) (Ajzen, 1991), Social Cognitive Theory (SCT) (Campeau & Higgins, 1995), Technology Acceptance Model (TAM)

(Davis, 1985), Model of PC Utilization (MPCU) (Thompson & Higgins, 1991), The Motivational Model (TMM) Davis *et al.,* 1992), Task Technology Fit (TTF) (Goodhue & Thompson, 1995). Combined TAM and TPB (C-TAM-TPB) (Taylor & Todd, 1995), TAM2 (Venkatesh & Davis, 2000) and relatively broader model. The Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh *et al.,* 2003). The behaviour intention would mediate the variable the relationship between E-health and the behaviour usage.

Schaper and Pervan (2007) state that healthcare lags behind other industries in the use of ICT. Nonetheless, the use of ICT in health is increasing and administration in many hospitals is computerized. Applications, such as: Clinical Information Systems, the Internet, Telemedicine, Personal Digital Assistants, Electronic Patient Records and others will eventually become commonplace in health (Schaper and Pervan, 2007). However, individual medical professionals have not fully embraced ICT (Chismar Wiley-Patton, 2003; Dearne, 2003; Murray, 2002; Wenn *et al*., 2002; Western *et al*., 2001). This reluctance to use ICT applications by medical professionals justifies the need for further research on E-Health user behavioural intention factors.

Although research has listed the reasons for barriers to using ICT within health (Kaplan and Shaw, 2002), there is a "paucity of scientifically rigorous research on acceptance and utilization of ICT within the healthcare industry" (Schaper and Pervan, 2007, p.2). The barriers to ICT use lie in the reluctance of users to accept ICT. This is due to user issues such as: time, training, compatibility within their work practice, roles and responsibilities, and others. A study by Shaw *et al.,* (2008) found that ICT implementations must address different user needs in terms of education and training. Therefore, user acceptance issues will gain increasing importance as the use of ICT continues to penetrate the health sector. In a recent report on Australia"s proposed national health information network, Health Connect, user acceptance issues were discussed as a barrier to successful implementation of the project. This report provided further evidence of the need to increase understanding of user acceptance in order to overcome issues of non-acceptance hindering ICT adoption and successful utilization (Fitzgerald *et al.,* 2003).

Technology acceptance research is a mature field in information systems research (Venkatesh *et al*., 2003), with many models and theories developed and tested. However, despite the large volume of work in this area, very little research has been conducted in a healthcare context, representing a significant gap in knowledge (Schaper and Pervan, 2007).

Previous studies had shown that the behaviour intention was the most important determinant of the actual behaviour. Studies done by Zhou (2008) argued that the most important factor that determines user acceptance and use of technology such as E-health system, was the user's intention. Behavioural intentions had been widely researched, especially in the information system research, however, there was need for further research to enhance the understanding of the area. The extensions to the various models identified in previous research mostly enhance the predictive validity of the various models beyond the original specifications'' (Venkatesh, *et al.,* 2003 p. 445).

Past studies, have revealed a number of variables as factors that influence behavioural intentions, for instance the perceived risk and perceived relative benefit (Lu *et al.,* 2010), compatibility, perceived ease of use, perceived usefulness, perceived system quality and computer self-efficacy (Chang & Tung, 2008). variety of 3G services and service quality (Mardikyan *et al.,* 2012), attitude, subject norm and self-efficacy (Lam *et al.,*2007), impulse purchase orientation, quality orientation, brand orientation, online trust and prior online

purchase experience (Ling *et al.,* 2010), perceived usefulness, perceived price, perceived security, perceived trust and perceived risk (Lin *et al.,* 2010), perceived risk, privacy concerns and trust (Liao *et al.,* 2011), flexibility of WBT system, system interactivity, system enjoyment, performance expectancy, effort expectancy, social influence and facilitating conditions (Alrawashdeh *et al.,* 2012), performance expectancy, effort expectancy, social influence and disturbance concerns (Lai *et al.,* 2009).

METHOD

The study adopted explanatory survey design targeting all nurses enrolled through Africa Medical Research Foundation (AMREF) Training and working in Kiambu, Nakuru and Nairobi County public hospitals, in Kenya. Purposive sampling was used to select the nurses who were undergoing the Africa Medical Research Foundation (AMREF) training programme within the three Counties. The total population of the study was 1031, a sample size was targeted for the study 345, of which a sample of 333 was collected for the study. The sampling technique used was a multi-stage sampling technique. The first was stratified sampling method to pick on the three county, each county was a strata. The second stage was purposive sampling method to pick on the hospitals, hospitals with less than five nurses were not sampled in the study and the third stage was random sampling of nurses in each of the hospitals selected to pick on the nurses undergoing BSc nursing under AMREF E-health programme. The data collection instruments that were used were structured and semi structured questionnaires. The instrument was tested for reliability and validity before full data collection was done. The data processing, data screening and data analysis was done. The test for the assumption of the study was done on the multi-collinearity, normal data, linearity and hetero-scedasticity. Multiple linear regressions were used to test the postulated hypotheses.

RESULTS

Table 1: Regression Coefficients of Strategic Support on E-health Adoption Behavior Usage

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
Model A: Implementation concept on e-health adoption behavior usage					
[a](Constant)	0.003	0.047		0.056	0.956
Strategic support	0.142	0.051	0.145	2.769	0.006**
[b](Constant)	0.005	0.047		0.118	0.906
Strategic support	0.134	0.051	0.137	2.618	0.009**
Technical concept	0.132	0.068	0.134	1.940	0.053*
[a]Null model; [b]Controlled model; *** sig at 1% and ** sig at 5%					

*Source***:** Survey Data, 2017

Table 2: Regression Coefficients of Behavior Intentions on Strategic Support E-health and Adoption (Behavior Usage)

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)a	18.814	0.334		56.318	0.000
Strategic support	0.969	0.371	0.138	2.613	0.009**
(Constant)[b]	18.862	0.333		56.698	0.000
Strategic support	0.934	0.369	0.133	2.531	0.012**
Technical concept	1.218	0.54	0.174	2.255	0.025**

[a]Null model; [b]Controlled model; *** sig at 1% and ** sig at 5%. Dependent=behavior usage

Source: Survey data 2017

DISCUSSION

The ninth objective of the study was to establish the mediation effects of Behaviour Intentions between the Strategic Support and Adoption (Behaviour Usage) of E-health by nurses in public hospitals. The study found out that the Strategic Support had no significant relationship with Adoption (Behaviour Usage). The first hypothesis Ho_{9at} postulated that strategic support had no significant effect on the relationship between the Strategic Support and Adoption (Behaviour Usage). The second hypothesis the behaviour intention does not mediate the relationship between strategic support and adoption. Both the hypotheses were rejected

It was a determinant of E-health Adoption as mediator between the Behaviour Intention and Adoption as purposed by the study. Therefore the hypothesis was rejected meaning there was a relationship.

The study confirms that given that if it was a government institution, you would expect the Strategic Support to influence the Adoption of E-health in these institutions. Further, it was a key determinant as the core concern of the study.

Hypotheses

$Ho_1(a)$:   Strategic Support has no significant relationship with E-health systems adoption among nurses in public health hospitals. Rejected.

$Ho_2(a)$:   Behaviour intentions will not significantly mediate the relationship between Strategic Support and E-health systems adoption among nurses in public hospitals. Rejected

CONCLUSION FROM THE STUDY

The conclusion was drawn based on the two objectives of the study. Strategic support have influence on the adoption of the E-health, however that mean that the government should

allocate funds for improvement for social involvement of the nurses in the E-health implementation in public hospitals.

There is need to focus on other areas that may influence adoption of E-health in public hospitals, these could in strategic support and training of the nurses. Recommendations for further research in the influence of culture on E-health adoptions in public hospitals.

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