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E-Healthcare/Telemedicine Readiness Assessment of Some Selected States in Western Nigeria

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ABSTRACT

Whilst healthcare is one of the biggest service industries on the globe it has yet to realise the full potential of the e-business revolution in the form of e-health. Wickramasinghe et al (2005). The objective of this research is to assess the readiness of the main players of health that is the health practitioners, public, patients and the managers towards e-Health in Nigeria.

In this work some selected states (Oyo, Osun, Ogun, Ondo, Lagos and Ekiti) in western Nigeria were chosen as the pilot study area, considering some critical factors of e-Health readiness such as need-change readiness, engagement readiness and structural readiness. The responses were analyzed statistically using descriptive analysis. The analysis was applied to determine the e-Health readiness status of health practitioners, public, patients and the mangers from the western part of Nigeria. The result of the overall evaluation of all samples shows that (i) health managers are not structurally ready, (ii) the public and patient fairly agreed but structural factor will be a constraint and (iii) the healthcare practitioners fairly agreed but structural, social influence, engagement will affect the successful adoption of the invention.

Keywords: *E-Health/Telemedicine, e-Readiness Assessment*

1. INTRODUCTION

Basically, e-Healthcare can be defined as the use of ICTs in the health sector for clinical, educational, and administrative purposes, both at the local site and a distance (Mitchell 2000). Such ICT use could range from basic electronic storage, retrieval and transmission of healthcare information, to more advanced applications such as tele-healthcare. Telehealthcare is eHealthcare involving electronic exchange of healthcare information to provide healthcare services across geographic, time, social, and cultural barriers (Reid, 1996). Telehealthcare includes Telemedicine which is a system of healthcare delivery in which physicians examine distant patients through the use of telecommunications technology.

There is great potential in eHealthcare to address a number of pressing problems facing healthcare systems in various national contexts, including clear inequities in health status, quality of care, and access, challenges often faced by rural communities (Health Canada, 1999). However, the successful introduction of eHealthcare requires the examination of complex social, political, organizational, and infrastructure factors which are at play when a technological innovation is successful or failing. (Penny et-al, 2003). Established innovation adoption and change theories suggest that multiple factors are at play when an innovation is successful or failing, although the interactions and relationships among these factors and innovation adoption are unclear (Harvard 2002). One such factor is 'readiness', which a preliminary requirement for success in eHealthcare adoption (Ibid).

Readiness is the cognitive precursor to the behaviours of either resistance to or support for a change effort (Armenakis et al 1993). E-Healthcare readiness can be defined as the degree to which a community is ready to participate and succeed in eHealthcare adoption (Harvard 2002). Understanding readiness is a critical first step towards the successful adoption of eHealthcare (Harvard 2002). Administrators, policy planners, and governmental agencies require clear mechanisms to determine the readiness status of communities before investments are made to help avoid failure rates associated with ICT projects. More so that, the failure of eHealthcare systems can result in substantial losses in time, money, and effort (Southon *et al*., 1997; Doolittle, 2001).

The main purpose of this study is to evolve a framework for rural e-Healthcare readiness study. Such a framework provides tools and technique for identifying the core factors of eHealthcare readiness in rural healthcare communities. That is, factors that either promote or impede the successful implementation of and participation in e-Healthcare by rural healthcare communities. Identification of such factors would provide baseline guide to informed decision making on appropriate eHealthcare technology solution adoption.

For this initial study, some selected hospitals and rural healthcare communities in selected states in western Nigeria were chosen as the pilot study area, considering some critical factors of e-Health readiness such as need-change readiness, engagement readiness and structural readiness.

E- Health in basic terms is moving client information without moving the client-using information and communication technology to deliver and support health services. E-health describes the application of information and communications technologies across the whole range of functions that affect the health sector, from the doctor to the hospital manager, via nurses, data processing specialists, social security administrators and - of course - the patients.

With the specter of the growing digital divide looming large, world leaders in government, business, and civil society organizations are harnessing the power of information and communications technology (ICT) for development.

This study has the broad objective which is to evolve a framework that provides tools and mechanisms to understand the readiness concept, and to determine the readiness status of RHCs including:

- Need Readiness: the identification of need and dissatisfaction with the *status quo;*
- Engagement Readiness: a state of questioning and risk assessment;
- Structural Readiness: the building of efficient structures and supports;
- Acceptance and Use Readiness: Intention to accept and use eHealthcare
- Non-Readiness: a lack of need or failure to recognize need

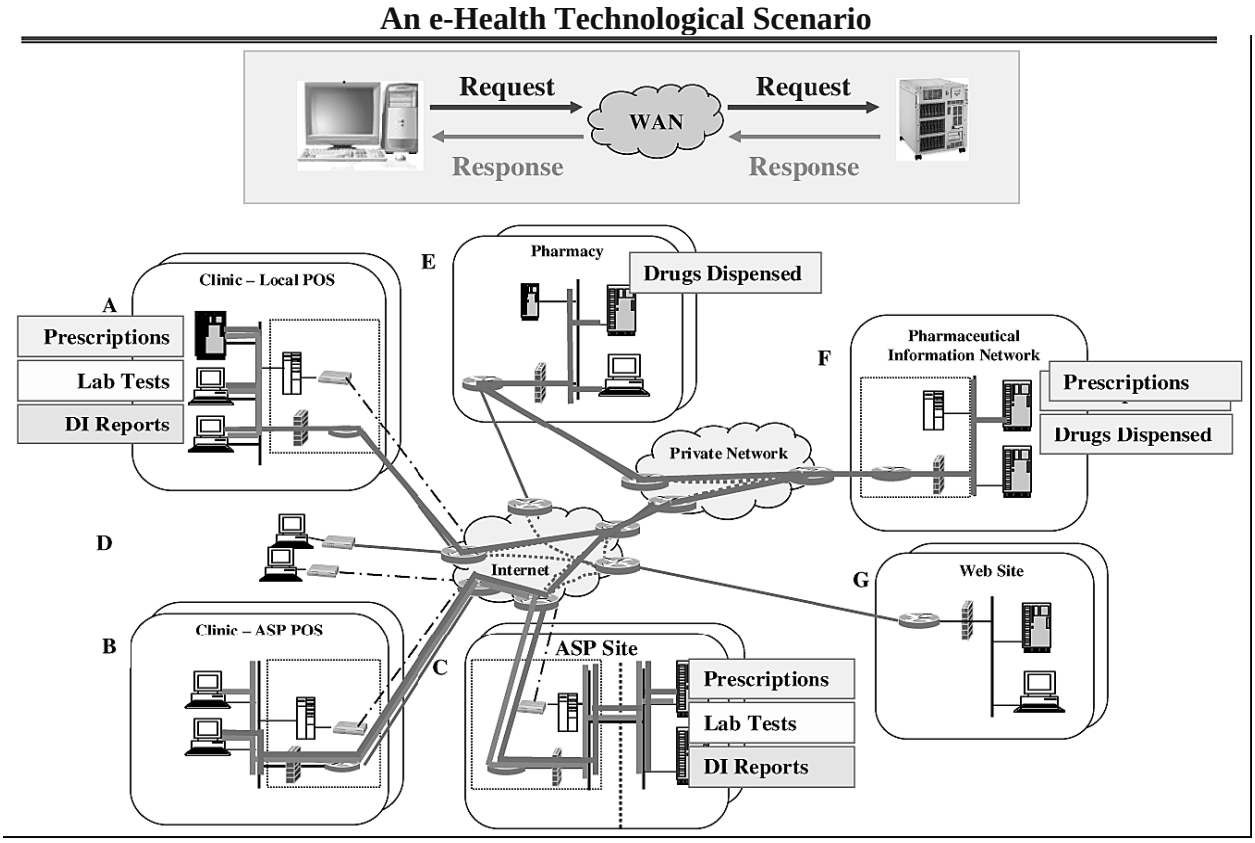

Figure 1. The essential ICT architecture for e-health (source: Wickramasinghe, N.S. et al (2005))

2. SIGNIFICANCE OF READINESS – ASSESSMENT

ICT projects are associated with failure. eHealthcare represents a substantial ICT investment, and as such, failure of eHealthcare systems can result in huge losses in time, money, and effort (Doolittle, 2001). It is necessary that all eHealthcare stakeholders have the tools and mechanisms to understand the readiness concept, and to determine the readiness status of communities before implementing costly eHealthcare innovations. (Jennett et al 2003)

In order to overcome a sense of risk that eHealthcare poses as a relatively unknown or untested solution, planners might listen closely to the concerns of various communities and respond to them by building strong, flexible, and responsive eHealthcare structures into

existing healthcare systems. In working to reduce the sense of risk, planners may enhance the sense of curiosity and willingness of various communities, in order to improve their health care system through the use of eHealth.

3. METHODOLOGY

Procedure:

The main steps in conducting the study are:

- Research & develop appropriate Rural eHealthcare Readiness Assessment (ReHRA) tool- Model and Instrument
- Identify Healthcare Community Site and relevant stakeholders for pilot study
- Obtain permission to conduct study.
- Conduct ReHRA pilot study to validate instrument
- Refine instrument based on pilot study results
- Conduct ReHRA in selected community sites

4. RESEARCH MODEL

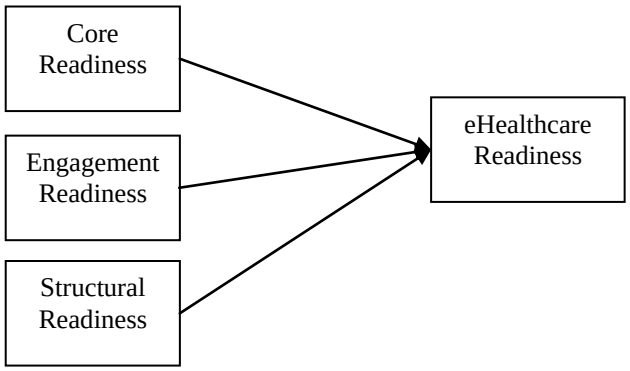

Table 1. Components of the Model

Construct	Definitions/ Characterisation
Core Readiness	A combination of 'real need' (usually based on conditions caused by isolation) and a felt or expressed dissatisfaction with current conditions, so strong that members of the community in question were willing to adopt new practices to create change. Readiness based on Isolation: • Having sense of frustration due to recognized inadequacy access to healthcare services and information; • Travelling long distances for: a) specialized healthcare services; b) skills upgrading; not available in rural facility. Readiness based on Dissatisfaction with the Status quo and willingness to change: • Current conditions viewed as unacceptable • Having sense of need for change
Engagement Readiness	A process in which community members are actively engaged with the idea of eHealthcare, weighing its perceived advantages and disadvantages, to provide insight into the factors that potentially encourage or impede further readiness for eHealth adoption. Awareness of the potential advantages and disadvantages of eHealthcare; Having sense/state of curiosity/critical mindedness about potential implications of eHealthcare adoption; Active questioning of eHealthcare as to what it could do and expressing hopes, fears and concerns about adopting eHealthcare. State of critical enquiry to see the cost benefit analysis of eHealthcare adoption, immediate and lon-term.
Structural Readiness	The extent to which there exists efficient structures to sup[port successful implementation of eHealthcare. This includes technical, human and organizational structures. Available/Accessible ICT and power supply; Human resources, organizational structures
eHealthcare Readiness	The degree to which a community is ready to participate and succeed in eHealthcare adoption
eHealthcare Non-Readiness	Empahsis on failed reference eHealthcare projects

Table 2

Core Readiness Factors	Engagement Readiness Factors	Structural Readiness Factors
Public • dissatisfaction with the current state of healthcare services • dissatisfaction with inadequate access to healthcare services and information • desire for change in status quo • sense of isolation /poor access	• wanting to know what eHealthcare is; having a clear understanding of eHealthcare • recognizing (or estimating) the benefits of eHealthcare • having a sensitive health condition; desire for privacy regarding health practice	• public education infrastructure • availability of formal and informal information networks • availability of testimonials from people • awareness campaigns • champions, especially local ones • community consultation sessions; sense of ownership • healthy inter-organizational dynamics in promotion activity
Patient • sense of isolation /lack of access • recognition of unmet need • desire for change; willingness to actively help themselves /their condition	• knowledge about what exactly eHealthcare is • knowledge about the benefits (or anticipated benefits) • fear of risk (anticipated risk) of using eHealthcare • gender sensiivity • privacy concerns • availability /reliability of content that fits rural /remote culture • concerns about eHealthcare as a replacement for already available services • sense of ownership	• education about eHealthcare • awareness about eHealthcare; • over-coming sense of vulnerability in eHealthcare • ability /training to use eHealthcare system • practitioner mediated liaison for eHealthcare programs
Practitioner • extreme dissatisfaction with the status quo • first-hand understanding /experience of negative effects of isolation • driving need to address a public or patient problem (as opposed to practitioner -specific one)	• innovators; champions • sense of curiosity • peer influence • evidence of utility • inter-group cooperation (between practitioners and the other domains) • intra-group cooperation (between working practitioners) • communication • openness; respect for others • willingness to make initial extra investment in time	• addressing scheduling concerns; overextended workloads • 24 hour access to Healthcare system • reliability in eHealthcare system functioning; good technical support; backup plans • reliable content-clinical and CME • liability
Organisation: • recognition of unaddressed needs • dissatisfaction with the organizational status quo	• champions • availability of risk-takers, pioneers • education /awareness process for innovators • reduction of nay-sayers /resisters • ability /willingness of senior administration to consider benefits outside standard business case /cost • effectiveness schemes • willingness to consider long timelines for implementation • movement from short-term funding; short-term accountability deadlines • cost-benefit analysis • established mechanisms of knowledge transfer between staff	• identification of equipment difficulties; 'bugs' • well-conducted needs assessment • community consultation process; ownership • allowance for creative use of equipment by practitioners and patients • accessible, comprehensive technical support: locally available and on-call • effective scheduling; integration into the routine • proper facilities: lighting, size, hvac-heating, adequate equipment • accessible, sustained staff training (including training at medical school to encourage routine perception) • provision of a eHealthcare coordinator • written policy on reimbursement, liability, cross-jurisdiction use, privacy • sufficient ongoing funding: local, provincial, federal buy-in

5. INSTRUMENT DESIGN AND ADMINISTRATION

A questionnaire instrument was designed containing three principal model constructs with 94 measurement items. Response to these measurement items are designed based on five-point Likert scale: The communities around some healthcare facilities within the Western part of Nigeria which comprises of six states viz: Oyo, Osun, Ogun, Ondo, Lagos and Ekiti were randomly chosen as the sample population areas for the pilot testing of the model. The questionnaire instrument was then administered. The population sampling frame comprises healthcare practitioners, public, patients and managers associated with healthcare facilities in the selected communities.

6. ANALYSIS AND RESULT

The total response number of questionnaire was 600 out of which 586 respondents evaluation was analyzed. Evaluations were given in terms of opinion elicited on the Likert scale. A T-test was performed on the respondent to get the percentage of people that are ready, averagely ready and people that are not ready at all.

For Patient as shown in the graph below, in terms of need-change readiness, 34% of our respondents are ready, 25% are averagely ready while 41% are not ready at all. Structural readiness, 25% are ready, 22% averagely ready and 53% are not ready at all. Engagement readiness, 34% are ready, 36% are averagely ready and 30% are not ready at all. The graph is shown below:

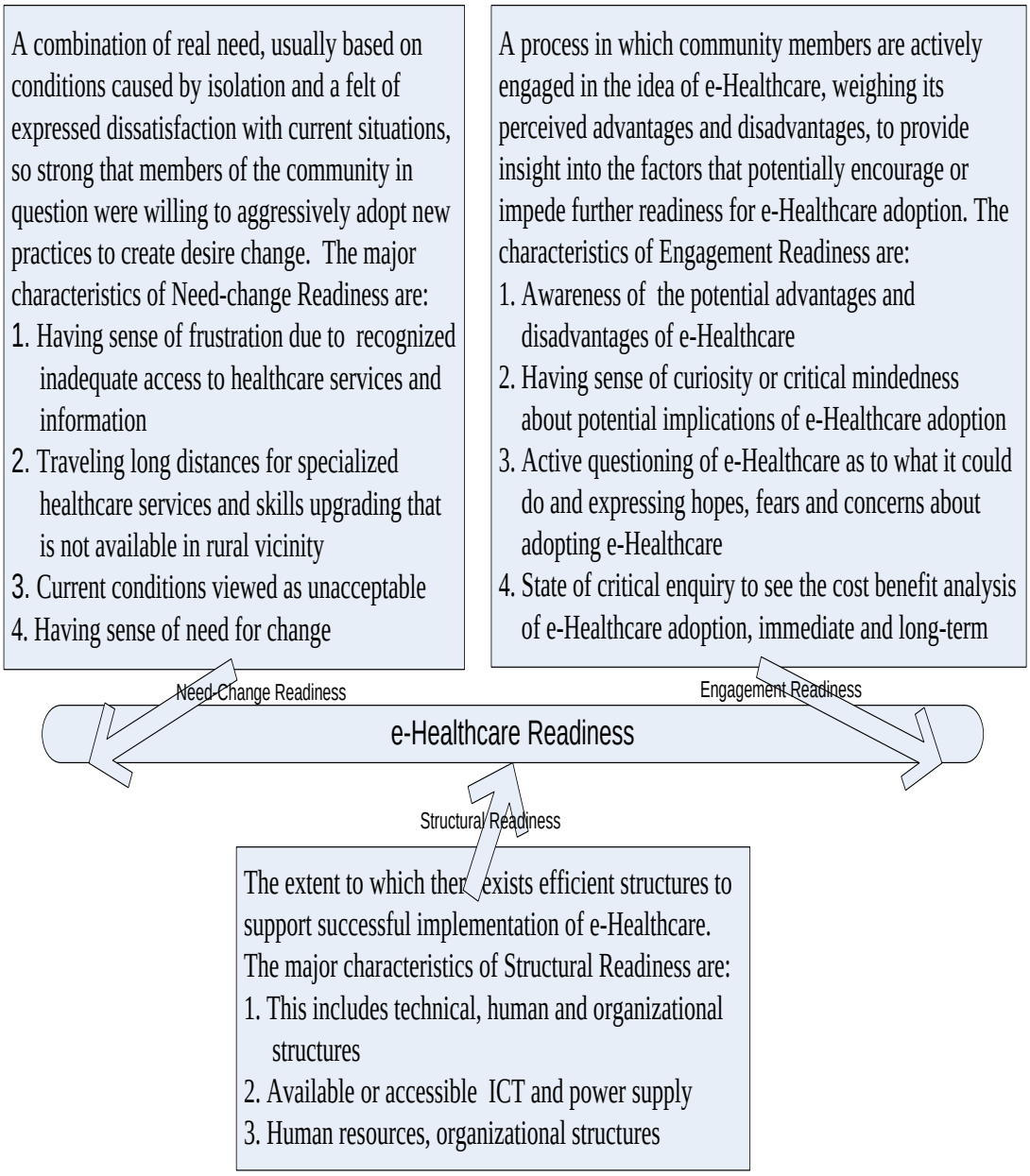

Figure 2. Model Construct and Characteristics (source: Ojo et al (2006))

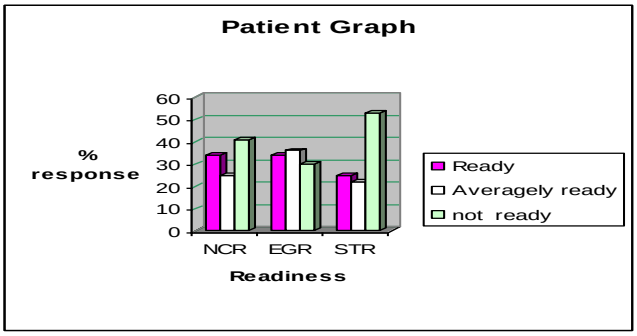

Figure 3. Graph of the Patient Response

Also for management in figure4 below, it was discovered that for need change readiness, 26% were ready, 25% were averagely ready and 49% are not ready at all. Structural readiness depicts that 36% are ready, equal amount are averagely ready while 28% are not ready at all. Fig5and 6 also shows the reaction of people to the readiness factors.

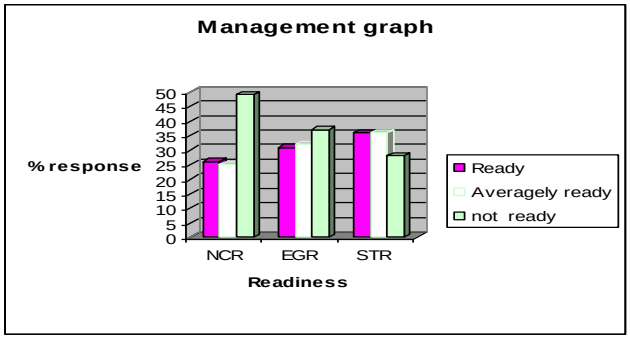

Figure 4. Graph of the Management

Figure 5 below depicts the reaction of the health practitioner in which the in the need-change readiness 29.1 %were ready, 43 % were averagely ready and 27.9 % were not ready at all. For engagement readiness 27.9% were ready, 37.2% were averagely ready and 34.9 were not ready at all. Also for structural readiness, 20.9% are ready, 37.2% were averagely ready and 41.9% were not ready at all.

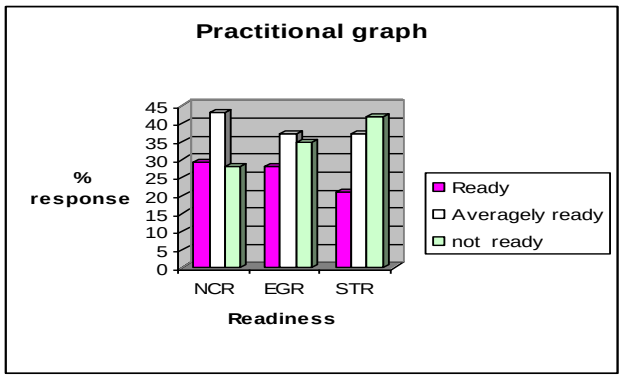

Figure 5. Graph of the Practitioner

For the general public, it was discovered that for need change readiness, 26% are ready, 52% are averagely ready and 22% are not ready. Structurally, 17% are ready, 42% are averagely ready while 41% are not ready at all. For engagement, 37% are ready, 35% are averagely ready and 28% are not ready at all.

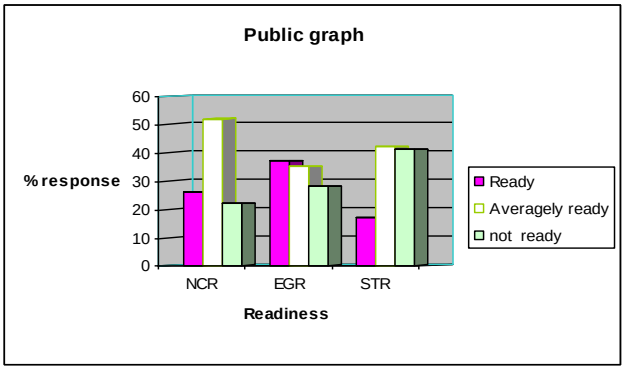

Figure 6. Graph of the Public

7. CONCLUSION

In this research, it was discovered that health managers are not structurally ready. For public and patient, it was seen that if e-health is introduced it will be a welcomed idea partially but it was discovered that structural factor will be a constraint. Also for practitioner, it was discovered that it will be a welcome development but some factors such as structural, social influence, engagement will affect the successful adoption of the invention.

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