

# A Conceptual Framework for Organizational Adoption of M-Health in Nigeria.

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## ABSTRACT

Mobile Health (M-health) is at its critical level of changing the health institution in Nigeria. However, most health organizations are unaware and lack the basic knowledge of achieving successful adoption and implementation of M-health. This paper tends to develop a framework for adoption of M-health in Health institutions in Nigeria. The Framework was developed by combing four known theoretical model of technology adoption. Namely: Diffusion Innovation theory(DOI), the Technology Acceptance Model (TAM), the Theory of Planned Behavior (TPB), and the Technology Organizational Environment framework. The framework shows M-health adoption in Organizations, it critically looked at two scenarios: decision by organization from start until the technology is acquired(readiness) and assimilation and use of this technology (Acceptance). The framework brings to limelight the different factors that influence M-health adoption in different stages. The study contributes to M-health literature by proposing an optimal M-health framework that includes organizational adoption and user acceptance of a new technology. It also gives a practical perspective for research and practice.

**Keywords:** Explanatory power, Diffusion Innovation, User Acceptance, M-health, Technology adoption.

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## 1. BACKGROUND TO THE STUDY

The use of technology has changed the way many things are done its impact even in the health institutions are felt anywhere around the world. This days, technology plays a significant role in consulting with patients and reporting health issues. The revolution in Information Systems aided by computers and internet has led to efficient and easy access to health care facilities and information. This technology has led some health institutions to integrate M-health into their system while others have not(Tuon, Gasparetto, Wollmann, & Moraes, 2017). The advent of hand held mobile devices such as smartphones, PDAs and tablets gave people the opportunity to access healthcare resources anytime and anywhere (Kim, Lee, Hwang, & Yoo, 2016). This mobile technology is considered novel and the devices are now available, cheaper, effective and easy to use. They makes it possible to communicate in an easy and flexible manner between people in the health sector (Ndayizigamiye et al., 2018).

Despite the emergence and proliferations of mobile devices in the healthcare sector and the enormous benefits it offers, this new technology ( M-health) cannot totally replace the traditional one – on- one consulting where psychology of the patient and other important factors are considered during diagnosis and treatment. This new approach (M- Health) serves as a support not a total replacement to the conventional system (Woldeyohannes & Ngwenyama, 2017)

The potentials of M-health have been noticed all over the world and many studies tried to look at the adoption of this technology at user and even organizational level. Many scholars are always on the field trying to explore how this new approach facilitates healthcare delivery (Zhao, Ni, & Zhou, 2018) . Notwithstanding, the technology (M-health) is effective, mobile and collaborative. It improves communication between different parties involved and encourages feedback for both the Users and the Organisation. M-health is still in its early stage of development, the technology has not been adopted in many organizations more especially in developing countries (Ndayizigamiye Patrick, 2018) There are several factors affecting the adoption of M-health amongst are which are not totally limited to : technical limitations; the connectivity ( network); the phone size(screen), insufficient memory, and transmission speed (Gücin & Berk, 2015) .The list is incomplete if user’s acceptance (both staff and the organization as a whole) is not mentioned, since the rejection of this technology by the users can cause drastic failure and of no benefit to the health institution. The success of this technology depends totally on the users(Gücin & Berk, 2015; Khan, 2017).

The adoption of this technology requires a lot of effort to challenge all the factors militating against its success, these factors are wide spread amongst the constructs of technology adoption models amongst are the awareness, Perceived usefulness, perceived ease of use, Reliability, Dependability, Subjective norms, Organizational size, organizational culture, government policy(Estuar et al., 2014), sustainability of the mobile phone and internet connectivity issues(Khan, 2017) and resistance to change(Haenssngen, 2015). Thus the adoption of M-health in organizations necessitates conceptual framework on how to organize a good and viable M-health system that attracts all users and provides them with essential services that will meet their demands. While dealing with infrastructural challenges and organizational resistance to change syndrome. It becomes imperative to explore all the critical success factors that supports a smooth deployment/ adoption of M-health in organizations.

This paper aimed at developing a conceptual framework for M-health adoption in healthcare organization in Nigeria. It critically explores the organizational adoption and user acceptance. A thorough review of literature was done on technology acceptance ( both individual and organizational level) the study then makes use of the most suitable concepts and relationship to explain M-health technology acceptance in health care institutions in Nigeria. The paper covers introduction, Theoretical background relating to M-health, then methodology which discussed the method applied to identify the theoretical components, Then the technology acceptance models and finally M-health conceptual adoption framework. Finally, conclusion and future studies was discussed.

## 2.0 THEORETICAL BACKGROUND

The most important factor in determining the success of implementing a new system in the context of health systems is the Readiness towards the adoption of the new technology (Susan E. Reid, 2016). Notwithstanding, M-health is still in its early stage of development and a lot of challenges are bound to surface Park, (Byomire, 2014). In other for M-health to succeed in health institutions, there is a need to assess the organizations readiness to this new technology (Hsieh, 2016).

Quite a number of studies has been done to investigate organisations' readiness for Mhealth (Latif, Rana, Qadir, Imran, & Younis, 2017) yet few were done in developing countries. Although there are lack of academic studies concentrating on the factors that influence the adoption of mobile health information system in Nigeria, a number of studies have not been used in the domain of mobile health care system (Mădălina Zamfir1(&), 2016; Michael L. Jones 2018). (Cheryl Forchuk, 2016) identified different factors that are quite dissimilar to those discussed in technology adoption theories and model, he argue that the relevant literature on technology adoption did not lead to any hypotheses, but rather broaden the understanding of the issues in technology adoption"

The models for technology adoption can be seen in two ways: adoption at individual level and also adoption at organisational level. Most researchers working on technology adoption at **organisational** levels leverages on Technology Organisation Environment (TOE) models ( Hoque, 2016) or the Diffusion Innovation Theory(DOI) (Azhar & Dhillon, 2016) to explore Adoption at Organisational levels. On the other hand, there are classical models that has been in used to explore adoption at the **individual** levels these are: Technology Acceptance Theory (TAM), Theory of Planned Behaviour(TPB), Theory of Reasoned Action (TRA), Social Cognitive Theory(SCT) Motivation Model(MM), Innovation Diffusion Theory(IDT) and Unified Theory and Acceptance and Use of Technology (UTAUT) has been used to study adoption at the individual levels (Kuttamani Tamilmani, 2007; Mburu&Oboko, 2018; Paglialonga et al., 2017; Vesna Dolnicar, 2017). Other Models have been created by combination of DOI, TOE, TPB, TAM etc to produce hybrid models that are used to study organisational adoption of new technologies ( Arachchilage, 2017).

The organisations' perception about adoption needs to be investigated as a first step to implementing the technology in a health systems (Alalwan et al., 2018; Azhar & Dhillon, 2016; Berrouiguet et al., 2016). Hence there is a need to conduct a thorough research and identify the factors organizations considers important in acceptance of this new technology (M-health) and adoption framework to guide process of implementation and sustainability.



### 3.0 RESEARCH METHODOLOGY

This study involves synthesis from most appropriate literature that could be used to frame the components that will be useful in assessing M-health adoption in organizations. A literature search was done on renowned databases (Emerald, MIS Quarterly, IEEE, ACM, Springer, and Science Direct) to identify theoretical models utilized in studying organizational and user adoption of information system. Below are the results and summary of the search.

S/N	Summary	Analysis	Results/Applications	Gap/ further studies
1.	Alalwan et al. (2018) Examining Factors Affecting Behavioral Intention to Adopt Mobile Health in Jordan. They tried to test the most important factors that could shape the intention of Jordanian people to use M-health.	They used: Perceived Usefulness, social influence, awareness and innovation as constructs. They apply structural Equation modelling tools for analysis on a Sample size of 365 participants	The drivers for adoption are: Perceived Usefulness, social influence, awareness and innovation.	Amongst the identified constructs, they did not identify the most important constructs. As suggested in Multi decision criteria Taha(2015)
2.	Ndayizi et al. (2018) Factors Motivating the Adoption of Self-Healthcare Mobile Monitoring Applications by South African Youths The study tried to explore and integrate factors that can motivate the use mobile healthcare application.	They use ease of use, demonstrability, accessibility, privacy, user satisfaction and affordability as key constructs.		
3.	Xu et al. (2018) Testing a Model for Adoption and Continuous use of Personally Controlled Electronic Health Record (PCEHR) Systems Amongst Australian Customers. A preliminary study The authors investigated the factors influencing adoption and Continuous use of PCEHR systems in Australian customers	Developed questionnaires and collected qualitative data which was subjected to analysis using the Structural Equation Modelling ( SEM)	External factors and influence, individual difference influenced (perceived benefits), External factors, influences and individual difference influenced (perceived user friendliness). Facilitating factors influenced both realized benefits and realized friendliness and voluntariness	They did not look at organizational adoption. Their interest is adoption at individual level



S/N	Summary	Analysis	Results/Applications	Gap/ further studies
4.	<p>Woldegohannes et al. (2017) Factors Influencing Acceptance of Contrived use of M-health Apps. The main aim of the study is investigate factors that predicts the adoption of M- health apps</p>	<p>UTAUT2 model was used, 11 participants were selected within the ages of 18-65. Analysis was done using close coding, thematic analysis, and co-occurrence analysis</p>	<p>Performance expectancy, effort expectancy, and habit were the constructs to predict adoption of the apps. Flexibility of personal preferences contributes to performance expectancy.</p>	<p>Significant factors were not captured in UTAUT2 constructs. Price value, facility conditions were not captured. Sample size was small, the study supposed to be more targeted to M-health than been generic</p>
5.	<p>Reid (2016). An Exploratory Framework Assessing Intrinsic and Extrinsic Motivators Related to Mobile Device Applications and Attributes for Canadian Seniors</p>	<p>The designed a conceptual framework</p>	<p>Seniors have extrinsic and intrinsic motives that needs to be integrated when designing app</p>	
6.	<p>Dolnicar et al. (2017) Understanding Acceptance Factors for Using e-care systems and devices: insights from a mixed method intervention study.</p>	<p>Mixed method was used</p>	<p>Heterogeneous needs and expectations on e-care systems. Fear of not getting help during emergency and perception of safety and peace are the key factors identified in the study.</p>	<p>Small sample size was used. Statistical significance as not tested</p>
7.	<p>Forchuk et al (2016) Evaluation of a Framework for Smart Technology Mental Health Intervention They evaluated a Framework used in mobile study in Canada</p>		<p>Effectiveness, economy, policy and ethics analysis</p>	



S/N	Summary	Analysis	Results/Applications	Gap/ further studies
8.	Mburu & Oboko (2018) A Model For Predicting Utilization Of M-Health Interventions In A Low-Resource Settings: Case Of Maternal And New Born Care In Kenya Proposed A theoretical model to predict The utilization Of M-health Products In Low Resource Setting	Partial least square method (PLS), Repeated Measures of Analysis of Variance ( RM- ANOVA) and Bonferron test	60.3 fit, 53.7 utilization predictive approach to user-predictive centered design offers greater flexibility in aligning attributes of an M-health intervention to full users' needs and expectation	Most of the m-health interventions has failed to justify value proposition to inspire utilization in low resource settings
9.	Hoque (2016) An empirical study of M-health adoption in a developing country: the moderating effect og gender concern. Study area: Bangledash The TAM model was used to identify the factors that influence the adoption of M-health services amongst young younger people in Bangledash.	Partial List Square Method( PLS) part of SEM	Gender was strongly associated adoption and use of M-health in developing countries	Focus on rural areas . Only a small sample of youg people was used in the study not the general population.
10.	Haenssgen (2015). Exploring the Mismatch between Mobile Phone Adoption and Use through survey Data from Rural India and China. The study investigated the relationship between mobile phone adoption and utilization. The research took place in China and India.			The research found it difficult to establish causal claim.



S/N	Summary	Analysis	Results/Applications	Gap/ further studies
11.	Ndayizigamiye & Moharaj (2016). Mobile Health Adoption in Burundi. The research investigated factors that prompted the use of M-health in Burundi.	A population of 212 primary health care professionals were interviewed in 5 provinces in Burundi UTAUT constructs were used	Effort expectancy, performance expectancy and facility conditions were identified as a possible predictors for M-health adoption in Burundi. The three (3) construct were believed to be significantly correlated.	The researchers proposed the use of Regression analysis to individually predict capability acceptance.
12.	Kim et al. (2016) Analysis of the Factors Influencing Healthcare Professionals Adoption of Mobile Electronic Medical record (EMR) using Unified Theory of Acceptance and Use of Technology in a tertiary Hospital. The study was to confirm factors that influence User's intention to utilize a new system (M-Health).	A designed and distributed to 942 health care professionals and log file analysis was performed on it. Structural Equation (SEM) and AMOS was used for data analysis.	A model was developed with positive end users response, positive attitude.	Validate the model using different hospitals, end users and relationships.
13.	Hammed & Arachchilage (2017) A Conceptual Model for Organisational Adoption of Information Systems Security Innovations. A theoretical model was developed for adoption of process of I.S security innovations in Organisations.	A model was derived from the combination of Diffusion Innovation Theory (DOI), TAM, TPB, TOE frameworks.	The model captures the organizational users aspect of technology adoption.	The researchers recommend that the model be validated, refine relationship using empirical investigations to establish a causal relationship.



S/N	Summary	Analysis	Results/Applications	Gap/ further studies
14.	Banna & Andri (2018). Health Solutions in Developing Countries Case of Kuwait. This is a pilot study on unbiased empirical evaluation of stakeholders towards e-health delivery solutions and services in Kuwait.	They used TAM and Q framework to evaluate stallholders adoption factors	Perceived security was least obstacle, usefulness and ease of use are the most apparent factors	
15.	Gucin & Berk (2015). Technology Acceptance in Healthcare: An Integrative Review of Predictive Factors and Intervention programs. The study investigated factors influencing the technology Acceptance and recent interventions that enhance technology usage.	TPB, TAM, DOI, and UTAUT	Suspicion of confidentiality and privacy are the strong influencing factors for rejecting technology. Others like the perceived benefits, ease of use, attracts the use of Technology	More theories be developed to capture all that is required.
16.	Gagnon et al. ( 2016) M-health Adoption by healthcare professionals: A systematic review. The study synthesizes factors influencing healthcare professionals adoption of M-health apps.	Reviewed related literatures from four databases from year 2000-2014	Perceived usefulness, ease of use, design and technical concerns, cost, time, privacy, and security issues, familiarity with technology, risk benefit assessment, and interaction with others	
17.	Curie (2016). Health Organisations' Adoption and usage of Mobile Technology in France, USA and UK. A survey of health organisations adoption and use of mobile technology.		Increase use of phones and health apps . increase access to data	A comparative study using different countries to show professionals and citizens the benefit of M. health.





S/N	Summary	Analysis	Results/Applications	Gap/ further studies
18	Marafu and Maboe (2017) Utilization of Mobile Health by Medical Doctors in Zimbabwean health care facility. The study investigated the potentials and challenges of M-health in delivery of healthcare service.	Quantitative, Descriptive, Cross Sectional and Analytical Design	83% believed that m-health is here to improve healthcare delivery. 93% are of the opinion that m-health has potential for future use.	
19.	Uddin et al. (2017) The Impact OF Mobile Phone-based Technology to improve health, population and Nutrition services in rural Bangladesh: a study protocol. The study aimed at developing a phone-based system to improve health, population and nutrition services in rural Bangladesh	Quasi – experimental pre-post design. It is a feasibility.		

## 4.0 RESEARCH MODELS

### 4.1 Technology Acceptance Models

A number of related works have been done to examine the adoption of M-health with limited studies in developing economies ((Azhar & Dhillon, 2016)), and more especially there is scarcity of such studies in Nigerian healthcare landscape. While some studies have developed a conceptual model to examine mobile-health adoption, however, none have integrated a stage adoption decision that include readiness and adoption. Thus, providing such kind of model will provide insights into adoption decision and critical factors influencing the adoption. In order to address the gaps and provide theoretical basis for adopting mobile-health technology, this paper integrated known theoretical models to provide comprehensive conceptual framework for mobile-health technology in Nigeria. (Kuttimani Tamilmani, 2017; Mburu & Oboko, 2018; Paglialonga et al., 2017; Vesna Dolničar 2017)

#### 4.2 M-health Adoption Model

Scholars have critically worked and still working on the different conventional innovation models. Some criticize and extend the existing models to give room for more constructs (Awa, Ojiabo, & Emecheta, 2015), some combined two or more of the models to achieve their desired objectives (Hameed & Arachchilage, 2017), some novice researchers indiscriminately combine the models without a thorough understanding of its implication (Furnell & Thomson, 2009), while some develop new models grounded from data (Charmaz, 2006). This paper intends to develop a conceptual model by combining Diffusion Innovation Theory (DOI), the Technology Acceptance Model (TAM), the Theory of Planned Behavior (TPB), and the Technology Organizational Environment (TOE) framework

#### 4.3 Technology Organizational Environment (TOE)

This model has advantage in the sense that is flexible and can be used with other technology acceptance models (Salleh, Janczewski, & Beltran, 2015). The proposed framework identifies the basic determinants of Technology, Organization and Environment as a strong pillar that influences the organizational adoption of a new technology (Cabrera, Cabrera, & Barajas, 2001). The Technology constructs captures both the internal and external technologies as it relates to the organization. Its main concerns is how the technology affects both the internal and external adoption process. The Organizational context speaks more of the characteristics (size, structure, culture, management, human and material resources) of the organization. The Environment context is the vicinity or place in which the organization is located. The operations in such location are liable to competitions with other business, regulations and government policies. As good as this models looks, it cannot stand on its own when developing a robust system that will take care of User perception. The drivers that made individuals to accept innovation or new technology has not been captured by the model.

#### 4.4 Technology Acceptance Model (TAM)

This models is derived by the concepts that “perceived usefulness and perceived ease of use” influences Technology adoption. It hinges on a belief that, perceived usefulness is the extent to which individual believes that using a particular technology will enhance his/her job performance. While perceived ease of use is the extent to which one believes that using a particular technology will make his/her work easier (Venkatesh & Davis, 2000). This models explains further that perceived usefulness and perceived ease of use are drivers to why users will wish to adopt a new technology. This model proved to be one of the widely accepted model, it tends to outshine TRA in explaining variance across many studies (Venkatesh & Davis, 2000). The shortcoming of TAM as being used only at individual level was mitigated by the combination of the different models presented in the conceptual framework (Awa et al., 2015).

#### 4.5 Diffusion of Innovation (DOI)

This model was developed by Rogers, it serves as a theoretical foundation to study technology acceptance in most IS researches. He defined diffusion as gradual flow of innovation to members through a channel over a period of time. This model suggest useful constructs which are useful in innovation adoption. Its characteristics (relative advantage, compatibility, complexity, trialability, and observability) are rich and could be used in technology acceptance both at individual and organizational level (Ajzen, 1991). The shortcoming of DOI as identified by (Hameed et al, 2014) was mitigated by combing the four models discussed in this study. Also, DOI can be combined with other theories to address the issues of attitude, intention and behavior (Awa et al., 2015).

#### 4.6 Theory of Planned Behaviour(TPB).

The shortcoming of TRA was mitigated which give rise to the TPB. This model was guided by three types of thoughts: behavioral belief, normative belief and Control belief(Armitage & Conner, 2001). This theory is believed to be effective to validate user's innovation acceptance, and the three (3) antecedents (behavioral beliefs, normative beliefs and control beliefs) directly or indirectly predicts individual behaviors and intentions for new technology. This research integrates TPB constructs and cannot use TPB as a sole model because it lacks strong explanatory power and cannot stand on its own(Awa et al., 2015).

#### 4.7 M-health Adoption process

The model in this study discusses M-health adoption in Organization in a dual perspective: integrating both the organizational and individual adoption process. The viability of the concept from introduction of M-health to the actual acquisition is considered as organizational level adoption, then, the user adoption stage which deals with when the technology is used by individuals is regarded as individual adoption stage. To respond to the established principle of innovation adoption in IS research(Moore & Benbasat, 1991)this study considered M-health adoption in two stages: Readiness and adoption. The study viewed readiness as every activity related to the need, acquiring relevant knowledge or sensitization, attitude towards technology, and making effort (intention) to adopt the technology. Acceptance is a state where the organization deliberately wish to start engaging the new technology to solve its daily problem or needs. It also involves review of the idea and evaluation of these ideas from the financial technical and mobilizing resources to acquire and implement the technology having ownership of the technology, training for the use of the technology, feedback on deployment and continuous use of the technology(Hoque, 2016).

#### 5.0 JUSTIFICATION FOR THE COMBINATION OF THE MODELS

Combination of DOI, TAM, TPB, helps us to develop a framework that integrates readiness and acceptance of the Mhealth Technology. (Hammeed et al, 2017). TAM and TPB has been used to explain or predict individual adoption from the users perspective(Venkatesh & Davis, 2000). TPB complements TAM constructs and adds or enhances TPB explanatory and predictive powers(Premkumar & Roberts, 1999; Venkatesh & Davis, 2000). TAM with TPB constructs allow predicting users acceptance of technology for both volitional and non-volitional conditions(Thong, Yap, & Raman, 1996). DOI, TAM, and TPB has been used in predicting or explaining either adoption or user acceptance at an individual level(Awa et al., 2015). To capture the organizational level, DOI, TAM, TPB has been combined with contextual framework(Quaddus & Hofmeyer, 2007). The TOE, DOI, TAM, TPB would extensively explain M-Health adoption at the Organisational level.

The use of DOI and TOE in the conceptual framework would explain adoption at organizational level, using the rich constructs they possess(Salleh et al., 2015). The DOI and TAM takes care of the readiness and Acceptance of use of this technology (Hammeed et al, 2017). The TAM and TPB accounts for the user's adoption of the M-health. Hence the constructs of TAM and TPB takes care of the adoption and continues use of this technology (Armitage & Conner, 2001). TPB has been uniquely used to predict user adoption of innovation at organizations where the use of technology is not under volitional control by the user(Premkumar & Ramamurthy, 1995)

## 5.1 The Proposed M-health Model

### Technology Characteristics

For the purpose of this research the following were considered under technology characteristics.

- **Perceived Usefulness:** the extent to which one believes that M-health technology can enhance his or her job performance.
- **Perceived ease of use:** the extent one to which one believes that using the M-health can save energy and make the work easier.
- **Relative advantage:** the extent to which the M-health innovation is believed to be better than the existing knowledge
- **Compatibility:** the extent to which the new system (M-health) closely fits the existing(old) system
- **Complexity:** the extent to which the new system (M-health) is believed to be difficulty to understand. Simple system have high chances of adoption than complex system.
- **Triability:** the extent to which the M-health could be practicable and experimented upon
- **Observability:** the extent to which the result of the new system (M-health) can be visible to others.

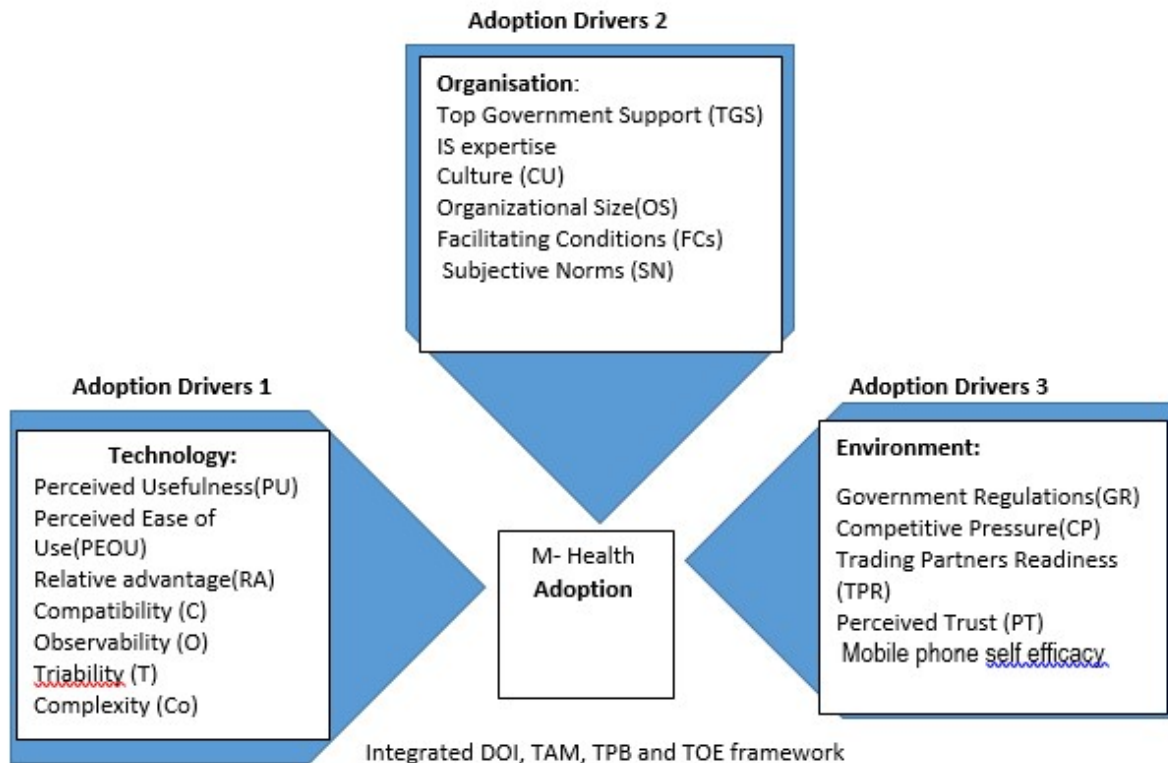


Figure 1.1 M-Health Conceptual Framework

### Organizational Characteristics

For the purpose of this study, the following constructs were considered.

- **Top management support:** the interest of the policy makers on the new technology (m-Health). The more interested the top management in M-health the easier and quicker for the system to adopted, vice vicer.
- **Subjective norm:** the social pressure put on the employee by the organization as a result of the new system (M-health). This pressure have effect on innovation acceptance.
- **Facilitating conditions:** this is the extent to which one believes that the technical and other infrastructure are available to support M-health. The more technical and other support services, the higher the chances of adoption.
- **Organizational size:** the size of an organization is also a major determining factor, the size determines the slack resources, structure and decision making.
- **Organizational readiness:** is the extent to which organization acquires resources (both material and human) to adopt to a new technology (M-health).
- **IS Expertise:** the availability of IT knowledge is a major factor, organization with sound It knowledge makes adoption easier and quicker.
- **IS Culture:** the beliefs and value system can affect technology adoption in either a positive or a negative note

**Environmental Characteristics;** for the sake of this study we consider:

- **Government regulation:** the support or regulatory policies can have a great effect on the technology adoption. The cases of tax, trade, investment, product liability, consumer. Protection, human resources can have a significant effect on technology adoption.
- **Competative Pressure:** this could be called external forces that triggers rivalry which eventually leads to better innovations and proactive decisions for a better product and services
- **Percieved Trust:** this is attached to the customer readiness in any innovation adoption. The sense of security, privacy, safety is paramount more especially if the new knowledge has the capacity to move beyond the confines of a simple concept. Lack of trust may have a negative
- **Mobile phone self efficacy:** the confidence or drive for the use of mobile phones. The degree to which one drives pleasure in using mobile phones.

### 5.2 Sustainability

Sustainability is a critical part in systems development that are always neglected in recent times. A robust system most meet user's requirement and be viable. Viability in the M-health context connotes continuous upgrading of the system to perfectly meet the user's requirement and the purpose to which the system was built. Also, supporting the M-health technology with policy statement from the government is very important so that the good purpose of such systems was built will not be highjacked by changes in government, politicians or other unproductive tendencies. Moreso, having a well structured feedback mechanism for both the stalkholders, users and the systems developers will go a long in way in keeping the system for a long period of time. The mechanisms should either be corrective and instructive. The aspect of training and continuous retraining for both the staholders, health staff is also critical to the sustatanability of the M-health system in Nigeria. New staff needs to be trainned on all the features of the apps and old staff can go refresher training to ensure they are knowlegible on all the updates on the platform.

## 6.0 CONCLUSION AND FUTURE STUDIES

A model was developed using the DOI, TPB, TAM, TOE for organizational adoption of M-health in Nigeria. The study explores the two different forms of adoption: adoption at organizational level and adoption at the individual or users level. The paper diffuses all the construct of the above mentioned models into an integrated framework that can cater for Organizational Adoption of M-health. The careful selection of each of the model complements each other in their area of shortcoming, predictive and explanatory power. The framework developed has not been tested, real life data are needed to validate the framework. The attributes identified in the model could be critically analyzed to establish possible relationships between each attributes. A sensitivity analysis could be performed to show the extent to which one construct affects the other at every stage of the M-health adoption process.

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