

Conceptual Model of the Unified Theory of Acceptance and Use of Technology (UTAUT) Modification on Telecentre Acceptance in Nigeria

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Abstract- The most important factors for the success of Information Technology implementation is users' acceptance and use of that technology. Nigeria Government under the auspicious of United Service Provision Fund (USPF) is implementing Community Telecentre Program. Telecentre projects are implemented in an attempt to curtail the anomaly of dearth of Information Technology (IT) facilities in most of the underserved and unserved areas. However, review of literature reveals a paucity of model available regarding the acceptance and use of Telecentre in Nigeria. This paper is an attempt in proposing a conceptual Model of UTAUT Modification with Management effectiveness and Program effectiveness constructs towards user acceptance of Telecentre. The paper's approach is based on literature review on the basis that, the incorporation of these constructs into UTAUT model in context of Telecentre is crucial in understanding the antecedent factors of user acceptance of this useful tool of bridging digital divide. Consequently, the proposed model is set forward as the basis for future empirical study to validate the model in a context of a developing country like Nigeria.

Keywords- Telecentre, Digital Divide, UTAUT, Management Effectiveness, Program, Effectiveness

I. INTRODUCTION

In most of the developing countries, geographic and interconnected adversities are some factors that may hinder accessibility and physical access to ICTs (Akinsola, Herselman, & Jacobs 2005). Basic infrastructure provisions, like roads and electricity can pose challenges to the physical access to technology. High cost of hardware, telecommunication and internet connectivity can create a barrier to availability, accessibility and affordability of ICTs in rural areas (Zahurin, Shafiz, Wan & Yusop, 2010). The advancement in technological innovations has not yet conveyed any remarkable transformation in the living standards of rural communities of sub-Saharan nations. For instance, despite the liberalization of telecommunication sub-sector in Nigeria in 1990's, the rate of Internet diffusion is slow compared to spread of mobile telephone, at the moment only 11 million Internet users are documented (ITU, 2009). Studies have shown that one of the major barriers to the accomplishment of the viability of ICTs in rural areas in sub-Saharan Africa is lack of access (Mayanja, 2001). The most viable solution to this problem is the establishment of Telecentres (Adam & Wood, 2001; Gomez & Hunt 1999). Telecentre provide wired, wireless or satellite connectivity and quality assured portals to the global network. Telecentre are typically equipped with networked of computers, internet access program and application software. They are also equipped with common accessories like printers, scanners, photocopiers and telephones. Deployment of Telecentre will bring the benefit of new ICT to the rural poor in an attempt to enhance universal access. Telecentre permit access to Information and Communication Technologies facilities

in a shared manner, whereas, the goals of providing access to individual or household for most people of the world could not be realized. The conception of Telecentre is a proven essential tool for addressing the digital divide by providing the unserved and or underserved populations access to ICT resources that could not have been afforded privately (Zahurin et al., 2010). In recent time, the Universal Service Provision Fund (USPF) in Nigeria implements school Net and the Community Telecentre (USPF, 2009). The USPF has roll-out twelve communities Telecentre. Two centre in each of the six geopolitical zones in Nigeria. The community Telecentre are being operated through franchise that deliver connectivity to un-served and underserved communities with the intention of using ICT to facilitate poverty alleviation, employment generation, improving understanding between different ethnic and religious group and as well as an improvement in e-governance and e-commerce. The continued investment and Proliferation of community Telecentre throughout the country has necessitated interest in the study of factors influencing end-user acceptance and utilization of IS. Since utilization has been shown to be a critical element of IS success, great attention has to be given to the factors that positively influence end-users to use Information Technology (IT) platforms. One of the most important factors for the success of Telecentre implementation is users' acceptance and use of that technology. Review of literatures reveal a dearth of study on a model regarding the acceptance and use of these tools of digital divide specifically considering the ineffectiveness of most programs implementation in context of non-profit. This paper proposed a conceptual model of a modified Unified Theory of Acceptance and Use of Technology (UTAUT), to understand factors that

influence User acceptance community Telecentres. The model can be applied to find the answers to the following research questions:

- a. To what degree does the four constructs in the UTAUT model demonstrate effect on user acceptance of Telecentre?
- b. Does anxiety has effect on behavioral intention on user acceptance of Telecentre?
- c. Does management effectiveness and program effectiveness have effect on behavioral Intention in UTAUT model in context of Telecentre?
- d. Can demographic variables of Age, Gender, ethnicity and Location moderate the relationship in proposed model constructs?

II. LITERATURE REVIEW

Venkatesh et al., (2003), conducted an empirical research to compare the eight competing models. The Models were integrated in terms of their conceptual differences as well as empirical resemblances (Jackson, Park & Probst, 2006). The idea behind the unifications of these Models is too arrived at the unified view of user acceptance of IT (Venkatesh et al., 2003). The eight Models that described the constructs in UTAUT include: The Theory of Reasoned Action (TRA) Fishbein and Ajzen (1975). Technology Adoption Model (TAM) Davis (1989), Theory of Planned Behavior (TPB) Ajzen (1991), Combined TAM and TPB (C-TAM-TPB) Taylor and Todd (1995), the Diffusion of Innovation Theorem (DOI) Rogers (2003). The Social Cognitive Theory (SCT) Bandura (1986), the Motivational Model (MM) Davis, Bagozzi and Warshaw (1992) and the Model of PC Utilization (MPCU) (Thompson, Higgins & Howell, 1991). Based on the constructs from the enumerated Models, Venkatesh et al., (2003) proposed a unified model called UTAUT. This model posits four core determinants of intention and usage, performance expectancy, effort expectancy, social influence, and facilitating, including four moderators of key relationships, Age, gender, experience, and voluntariness of use. Empirical results of the UTAUT model revealed that it was able to account for 70% of variance in usage intention (Venkatesh et al., 2003; Shaper & Pervan, 2007). This result to a large extent performed better than that of any of the original eight Models/Theories and their extensions (Venkatesh et al., 2003).

Previous literature on Technology Acceptance Model (TAM) identified perceive usefulness and perceive ease of use as an important antecedents of an individual intention to use a technology (Davis, 1989). In a later research, the perceived usefulness has been associated with performance expectancy while perceived ease of use has been equated to effort expectancy (Venkatesh et al., 2003). Performance expectancy and effort expectancy is by extension been posited as determinant of an individual

intention to use particular technology. Studies by Venkatesh et al., (2003), established that performance expectancy remain robust in both voluntary and mandatory environments. The used of social influence has foundation from both TRA Fishbein and Ajzen (1975) and TPB Ajzen (1991). Its applicability to Telecentre initiatives required additional attention, being that Telecentre apart from providing ICTs facilities, it does provide an avenue for social cohesion and inclusion to the community it is intended to serve (Zulkhairi et al., 2009). Anxiety as a construct was introduced to information system (IS) literature by (Campeau & Higgins, 1985). Studies by Venkatesh et al., (2003) found that it has no significant relation with behavioral intension the need to re-examine this construct in different context and culture required further attention. Prior Models in TAM assume Information System (IS) adoption to be free of obstacles. The introduction of a facilitating condition construct by Triandis (1980) and adaptation by Venkatesh et al., (2003), makes the UTAUT model more robust and attractive in both mandatory and voluntary environment.

Review of the constructs that determined the antecedent of user acceptance of technology necessitated the need to extend the frontiers of the determinants of user acceptance in the UTAUT in different context. Telecentre is a non-profit initiative to the inhabitants of underserved and unserved areas. The constructs in UTAUT do not reflects the most specific influence in the context that may affect user acceptance Telecentre. On the basis of this, in the context of non-profit organizations like Telecentre a two-level competing value approach to measure its' effectiveness as suggested by Balduck [1] is incorporated into the proposed model. The two levels analyzed are effectiveness of the telecentre at program and management levels, which are proposed by Sowa [14]. The two constructs have theoretical foundation from Competing Value Approach (CVA) originated by Quinn [12]. The modification of UTAUT is in line with the recommendation by Venkatesh[15], suggesting the extension of the model by concentrating on developing deeper understanding of the dynamics that influences users' acceptance of technology. This is done by identifying constructs that can add to the prediction of intention and behavior over above what is already known and understood. Thus, additional variables introduce to UTAUT model in context of this study are: Anxiety, Management effectiveness and Program effectiveness.

The need for an effective organization to function at both the management and program levels is imperative more so in non-profit organization. An organization that provide well run programs but has unmotivated staff or poor overall organizational operations is not fully effective, on the other hand an organization that is well managed and operated but delivers poor programs is not fully effective (Sowa et al., 2004). Most often out-come has been the indicator of measuring effectiveness in an organization without considering the vital roles associated with these two levels of effectiveness. The relationships between Management

effectiveness and Program effectiveness with the behavioral intention in UTAUT need to determine as suggested by Venkatesh et al., (2003), earlier studies in the literature that examined this relation with behavioral intention in UTAUT to the best of our knowledge is limited and that research focusing on measuring the two level of effectiveness in Telecentre from the bottom up perspective is sparse. The Figure 1, Shows the original UTAUT Model.

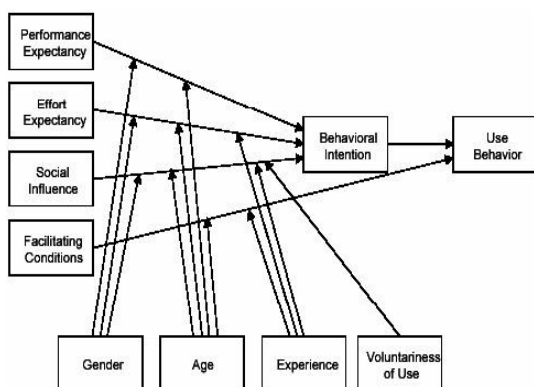


Figure 1. Source: The UTAUT Model (Venkatesh et al., 2003, p.447)

III. Proposed Conceptual Model

The constructs of UTAUT model are performance expectancy, effort expectancy, social influence and facilitating conditions (Venkatesh et al., 2003). Anxiety was posited not to have a positive relation with behavioral intention in the model. The need to re-examine the construct of anxiety in different context and culture becomes essential. Further, in the proposed model management effectiveness and program effectiveness constructs proposed are entirely posit to have a significant role as direct determinants of behavioral intention toward user acceptance of Telecentre. The entire constructs are moderated to some degree by age, gender, ethnicity and Location, Venkatesh et al., (2003) in their analysis of eight models/theories of technology acceptance found that with the exception of Social Cognitive Theory (SCT) and Motivational Model (MM), the predictive validity of the models increased after including the moderating variables. Figure, 2 below shows the conceptual model of the UTAUT modifications.

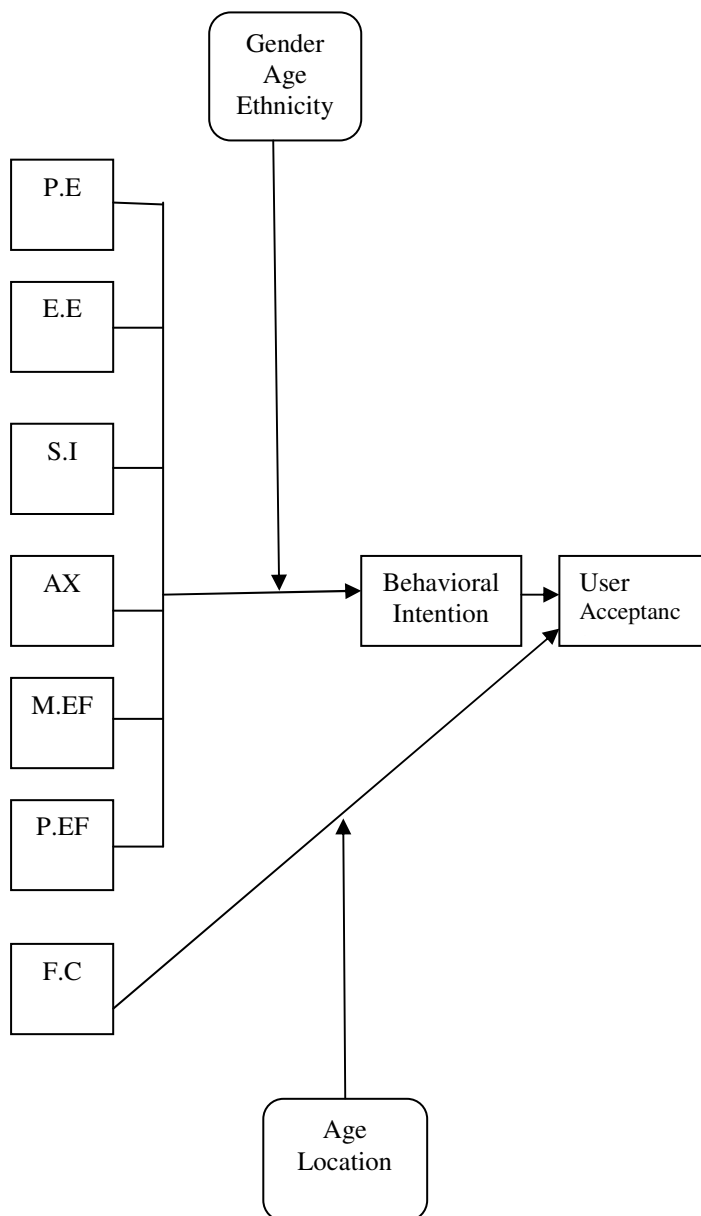


Figure 2: Proposed Conceptual Model

Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Anxiety (ANX), Management Effectiveness (MEF), Program Effectiveness (PEF), Facilitating Condition (FC), Behavioral Intention (BI), User Acceptance (UA)

The variables indicated in the conceptual model are thus defined based on (Venkatesh et al., 2003; Balduck & Buelen, 2008; Sowa et al., 2004):

Performance expectancy

Performance expectancy is defined, as the degree an individual user believes that using the Telecentre will help in improving his/her performance. The construct that depict performance expectancy has foundation form: perceived usefulness (TAM/TAM2 and C-TAM-TAB), job-fit (MPCU), extrinsic motivation (MM), outcome expectations (SCT) and relative advantage (DOI) Rogers (Venkatesh et al., 2003). Performance expectancy was reported as the most influential among all the UTAUT in predicting behavioral intention and remains significant at all point of measurement regardless of environmental settings (Venkatesh et al., 2003). Adapting performance expectancy in context of Telecentre implied that users will think telecentre is useful because it enables them to accomplish surfing activities more quickly and flexibly, or access to information more effectively.

Effort Expectancy

Effort Expectancy is the degree of ease user feel with respect to the use of Telecentre. This construct has theoretical foundation from the three construct from different models that relate to effort expectancy (Venkatesh et al., 2003). These are perceived ease of use (TAM/TAM2), complexity (MPCU), and ease of use (DOI) [21]. In the context of Telecentre, Individual acceptance of Telecentre depends on ease of use of the facilities.

Social Influence

Social Influence is defined as the degree to which an individual user perceives that important other believe he or she should use Telecentre. Three constructs from the six models capture the concept of Social influence (Venkatesh et al., 2003). The construct are: Social factors (MPCU), subjective norm (TRA, TAM2, TPB and C-TAM-TPB) and image (DOI). Social influence was suggested as a significant influence in shaping individual intention to use new technology (Venkatesh and Davies, 2000).

Anxiety

Anxiety towards used of technology, is described as evolving anxious or emotional reactions when it comes to performing a behavior (e.g., using a computer) the apprehension, or even the fear an individual has toward the possibility to use a technology (Venkatesh et al., 2003). Anxiety as a construct has foundation from the Social Cognitive Theory (SCT) introduced to Information System by Campeau and Higgins (1985), as an extended SCT in the context of computer utilization.

Management Effectiveness

Management effectiveness refers to characteristics that deal with organizational issues and management actions on the staff within organizations (Balduck & Buelen, 2008). Measure of management encompasses variables that tap capacity (structure and process) as well as those represent the outcomes of these management systems and

activities (Sowa et al., 2004). This construct has basis from (CVA) theory (Quinn & Rohrbaugh, 1983).

Program Effectiveness

Sowa et al., (2004) refers to Program as the specific service or intervention provide by the organization. Going by this definition Telecentre as an intervention to underserved folks, has suitably fits into this definition. Further, Sowa et al., (2004), support that program has a variables that relate to the capacity (structure and process) as well as outcomes created by the intervention. The program effectiveness refers to the characteristics that deal with the services or programs provided by the organizations (Balduck & Buelen 2008). Program effectiveness construct has the same theoretical support from CVA.

Facilitating Conditions

Facilitating conditions are defined as the degree to which a user believes that an organizational and technical infrastructure exist to support use of Telecentre (Venkatesh et al., 2003). The theoretical foundation of Facilitating condition is derived from four Theories/Models used by (Venkatesh et al., 2003). Two constructs from the four models capture the concept of facilitating conditions. The constructs are Perceived behavioral control (TPB/DTPB, C-TAM-TPB) and the initial Facilitating condition (MPCU) by (Thompson, Higgins & Howell, 1991).

Behavioral Intention

The Behavioral intention construct originated from the Theory of Reasoned Action (TRA) by (Fishbein and Ajzen, 1975). The construct is defined as "a measure of the strength of one's intention to perform a specified behavior" (Ajzen, 1991). Research has shown that behavioral intention has a direct impact upon the individuals' actual use of a given technology (Ajzen, 1991). The behavioral intention construct was introduced to the MIS discipline through the technology acceptance model, an extremely important construct in the information management, due to its importance; it is, referred to "as a key criterion in user acceptance research" (Venkatesh et al., 2003).

User acceptance

Use behavior is used in this study as the indicator of user acceptance; as it is quite challenge to have data about actual usage. Study by Venkatesh et al., (2003), focuses on individual acceptance of technology by using intention or usage as a dependant variable. The study will adhere strictly to the measurements and analysis base on [6] with respect to reliability, validity. The survey instrument is described for further validation.

IV. CONCLUSION

Review of the IS success literature, reveals a dearth of studies that broadly address the issues of effectiveness incorporation into UTAUT model. This paper under studies the UTAUT model and proposed a modification particularly as it regard to management effectiveness and program effectiveness and the needs for the incorporation of these constructs in to UTAUT model in context of

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Appendix

Performance Expectancy

I would find ICTs in *Telecentre* useful in my job.

Using ICTs in *Telecentre* help in accomplishment of job more quickly

Using ICTs in *Telecentre* will increase my productivity.

Using ICTs in *Telecentre* enhances job efficiency.

If I use ICTs in *Telecentre*, I will increase my chances of getting an elevation. (Raise)

Effort Expectancy

My interaction with ICTs in *Telecentre* would be clear and understandable.

I find using ICTs in *Telecentre* easy.

I find using ICTs in *Telecentre* to be flexible.

Using ICTs in *Telecentre* frequently makes one to be skillful

Overall, learning to operate facilities in *Telecentre* is easy for me

Social Influence

People in my community think I should use ICTs in *Telecentre*

People who are important to me think that I should use ICTs in *Telecentre*.

People in my community who use *Telecentre* have more prestige than those who do not

Important people in my community have been helpful in the use of ICTs in *Telecentre*.

In general, my community has supported the use of ICTs in *Telecentre*.

Anxiety

I feel nervous about using ICT facilities in Telecentre.
It scares me to think that I could make mistakes by using the ICTs in Telecentre
The *ICTs* in Telecentre are somehow intimidating to me.
It scares me to use ICTs in Telecentre because I lack adequate skills.

Management Effectiveness

My expectation of this Telecentre is that it will be long-lasting
The management of this Telecentre receives financial assistance towards rendering efficient service
The management & staff of this Telecentre are friendly.
I observed team spirit and motivated staff within the Telecentre staff
Capable hands are available to impart knowledge in the Telecentre

Program Effectiveness

Using Telecentre help in socio-economic development of my community
ICTs Facilities in Telecentre are always accessible within the operation hours
Telecentre staffs are competent enough in discharging their work.
There is mutual cooperation between Telecentre staff and the users.
Over all, the likelihood of replicating this program in our neighboring community is clear.

Facilitating condition

I have the resources necessary to use *ICTs facilities in* Telecentre.
I have the knowledge necessary to use *ICTs facilities in* Telecentre.
Detail instruction about Telecentre use is available to me
There is sufficient Electricity and Internet service to use *ICTs facilities' in Telecentre*
A central support is available to help with technical problems
A specified person (or group) is available in case of difficulty

Behavioral intention

I intend to use *ICTs facilities in* Telecentre in the future.
I predict I would use *ICTs facilities in Telecentre* in the future.
I plan to use *ICTs facilities Telecentre* in the future.