

# Technology Adoption Life Cycle Model in Different Environment: Exploratory Evidence from Nigerian Telecom Market

Aminu Ahmad

Management & Information Technology Programme  
School of Management Technology  
Abubakar Tafawa Balewa University Bauchi, Nigeria  
aminu\_aa@yahoo.com  
+2348033896525

**Abstract.** Technology Adoption Life Cycle Model (TALCM) has proved to be a useful marketing tool for technology products. However the model was developed and mostly tested in developed markets. Against the backdrop, this research examines the viability of the model in new environments. The Nigerian GSM market is adopted as the study area because it presents contrasting features than where the model was frequently tested. The research relied on secondary data largely drawn from regulatory/operators' disclosure. The paper compares GSM operators marketing effort vis-a-vis TALCM prescriptions in relation with their market share for early and middle stages. Result indicates perfect correlation between compliance with the models' prescription and operators' market share. In essence, analysis of operators marketing effort and market share suggest the robustness of the model especially in the early stage where operators marketing effort were more divergent.

**Keywords:** Marketing, GSM, TALC Model.

## 1. Introduction

The last few decades witnessed an unprecedented wave of technological products. Telecommunication industry is at the forefront of these innovations. However, increased competition, marketplace and customer complexities meant spectacular losses, failures and bankruptcies to high-tech firms (Bolisani & Gottardi, 2005; Hinton & Barnes, 2005) despite avalanche of innovations. Bringing to limelight the need for effective marketing, at a time when the traditional marketing tools were offering less than satisfactory results (Moore 2003, p. 362). Hence the need for unique marketing model for technology products (Grönroos, 1990 & 1994; Moore 2003) or at least fine tuning the traditional ones (Grønhaug & Möller, 2005).

The situation is further aggravated given the rapid changes taking place in telecommunications industry. Thus, making it difficult for operators to acquire and maintain clients (Byrnes, 2004) and the high level of customer confusion in mobile phone market (Andersson & Heinonen, 2002). More so, survey on US consumers' perceptions of mobile service show that the level of satisfaction is much lower for mobile service carriers compared to other service sectors. In fact, 35 percent of US mobile subscribers in 2004 reported that they were considering switching mobile service carriers (Lim, Widdows & Park 2006, p. 208). Similarly, Aydin and Özer (2005) observed that telecommunications firms are losing 2-4% of their customers' monthly leading to loss of millions in revenue. In Nigeria for example, already one GSM licence was rebuked, another is virtually bankrupt and another one has change ownership five times with less than a decade history. The situation is not different in Malaysia where of the seven licensed in 1994, only three are operational (Asaari & Karia, 2003; Wong & Hiew, 2005). Accordingly, the birth of Technology Adoption Life Cycle Model (TALCM) was nothing short of delight as high-tech marketers were in desperate need of help given the poor results from the deployment of the Procter & Gamble approach (Moore, 2003, p. 362).

The goal of this paper is to examine the viability of the TALC model in new environment. Specifically the research empirically pushes the applicability of the model in four different environment/circumstances:

different socio-political set-up (under developed economy); different market structure (Oligopolistic as opposed to perfect competitive market); highly regulated sector as oppose to open industry; and intangible as against tangible technology product.

Telecommunication is playing an increasingly important role in today's globalize world. This suggests that no economy can achieve an appreciable level of development without a vibrant telecom sector (Ndukwe, 2004). Global telecom spending was projected to reach US \$2.0 trillion by 2007 (Telecommunications Industry Association: Industry Playbook, 2004). Mobile phone is the most effervescent and high growth area of telecommunication, with over 1.7 billion global customers and about 80% of the world's population covered by mobile networks (PricewaterhouseCoopers, 2006). Mobile phone is becoming so popular that people are abandoning landline to rely exclusively on mobile phones, primarily because of mobility, safety (emergency), price, variety and privacy (DeBaillon & Rockwell, 2005). In Nigeria, highly competitive digital mobile license auction in January 2001 marked the birth of GSM. Four firms: Econet Wireless Nigeria (later Vee Mobile, Celtel, Zain and now Airtel); Mobile Telecommunication (Mtel); Mobile Telephone Networks (MTN) and Communications Investments Limited (CIL) were given license. However, CIL license was rebuked due to firms' inability to pay the complete license fee within the stipulated deadline. In 2002, Glo Mobile became the fourth GSM operator in the country. Except Glo Mobile all the three licensed GSM operators roll-out their services in 2001. Glo Mobile, however, released their services in 2003. The oligopoly status granted the four GSM operators expired in early 2006, immediately after the number of licensed mobile operators rose to ten by virtue of unified license regime, although only one more operator released its GSM services i.e. EMTS Limited making a total of five active operators in the market today.

## **2. Literature**

### **2.1. The Model**

TALCM is a model for marketing discontinues technology product with roots in Individual Innovativeness Theory (IIT), marketing mix model and product life cycle model. Moore (1991 & 1995) building on IIT a key element of meta-theory of diffusion (Surry, 1997), proposed the TALCM. Technology life cycle is the predictable pattern followed by a technological innovation starting from its inception and development to market saturation and replacement (Norman, 1998). Moore (2003) postulated that technology adoption goes from left to right; enthusiasts discover the offering and tell the visionaries. The visionaries then will pass the good word on to the pragmatists, then to the conservatives and finally laggards. Moore (1991 & 1995) argued that the point of greatest peril in managing technology life cycle lies in making the transition from an early market to a mainstream market.

Norman (1998) concentrates more on the appropriate strategies for marketing to the different categories of the adopters. Based on a comprehensive study of the US PC marketing Norman (1998) concludes that, success relies on matching technology life cycle with appropriate marketing strategies. For example Norman (1998) observed while early adopters may overlook instability, inelegance and high price; late adopters on the other hand emphasize ease of use, convenience, good design and value for money. Key deduction from the model include: existence different categories of consumers and unique managerial, marketing and technical strategies for dealing with various consumers group. Hence, unless organizations match customers with appropriate strategies market share and sustainable profitability will be compromise; and commoditization, a sort of natural way whereby the prices of innovations goes down with time mainly due to standardization, improvement, economics of scale, new entrants etc (Hamel & Skarzynski, 2001; Kurzweil, 2004).

### **2.2. New Environment**

Nigeria shares virtually all the features of developing economy. For example, Pyramid Research (2001) revealed apart from the normal initial start-up capital expenditure for telecom firms (e.g. tax; customs/excise duties; site acquisition costs; equipment importation). GSM operators in Nigeria have to deal with additional capital outlay (e.g. Building/maintaining roads to base stations; generators to operate the network; backbone telecommunication transmission equipments; high interest rate and low value of local currency in

international market). In addition to economic realities there are also cultural differences between developed and developing nations.

Elegbeleye (2005), for example observed a linkage between GSM usage, culture and clients satisfaction in Nigeria. However, there is a growing recognition that media convergence is drastically pushing for global cultural convergence, mainly as a result of proliferation of channels and the increasingly ubiquitous nature of computing and communications (Jenkins, 2001, p.93). Despite Jenkins (2001) strong global cultural convergence argument, a number of literatures suggest that culture affects people's perception of long and short time (see Hall (1989) for example), this is imperative in GSM context since speed of delivery affects clients satisfaction judgments (Francis & Abu El-Ata, 2003). Recently, drawing on a sample across four continents-US and Finnish as well as Egyptian and Peruvian representing monochronic and polychronic cultures respectively Rose, Evaristo and Straub (2002) investigate the role of culture on customer reactions to download delay in online environment. They view monochronic people to be more organized and strict with their time compared to polychronic. The research not only found culture is a significant factor in perceptions of download delay but also found minimal within culture differences. In a related study Kaufman and Patterson (2005) recognize the role of exposure in engendering cross-cultural diffusion even though they found other factors to be more critical. Hence, can cultural differences nullify the versatility of the model? Apart from the state of the economy/culture telecom industry is unique from other 'open industry' due to strict regulation.

A key feature GSM market in particular and the telecom industry in general is strict regulation. It is argued that good regulations prevent uncompetitive behaviors and harmonize the profit maximization goal of operators with socio-economic national goals (Nxele & Arun, 2005). However, survey concludes that GSM regulation policies such as license fees and renewal time, spectrum allocation, interconnectivity arrangements, universal service obligation (USO) funding and determining number of operators, significantly impact operator's business plan and hence plays a fundamental role on operator's profitability (PricewaterhouseCoopers, 2006). Additionally, the survey reveals an optimal regulatory regime would lead to considerably higher levels of investment by 25% amounting to US\$4.6bn in sub-Saharan Africa alone. Similarly Doyle and McShane (2001) observed that regulatory clarity significantly affects GSM firms as operators were scared in making large-scale infrastructure investments and irreversible marketing expenditures in the absent of a clear cut guidelines. Building on Malaysian Communications and Multimedia Act 1998 (CMA) Lee (2002, p. 531) categorise telecommunication regulation into four (4) key areas *Economic Regulation Technical Regulation Social Regulation Consumer Protection*. More recently Troshani and Roa (2008) propose a mobile regulatory framework including minors' protection; privacy; contractual relationships; intellectual property protection; market and resources access. In essence, both Lee (2002) and Troshani and Roa (2008) suggest regulation in the sector stifle operators flexibility.

Theoretically, although high-tech diffusion research has been popular in marketing literature, there are limited studies conducted in developing nations (Talukdar, Sudhir & Ainslie 2002). Most studies focused on a single market (most often US markets) and single tangible product such as television set (Puumalainen & Sundqvist, 2005). As a result Da Silveira (2001) calls for research by pointing out the need to gather empirical evidence on managing innovation in developing worlds. Especially since developing countries present a unique operating environment with poor technology base, customers with low disposal income and high cost and scarcity of capital (Sull, Ruelas-Gossi & Escobari, 2004). Hence "it is not evident that we can derive reliable generalizations for developing countries by analyzing the diffusion process across wealthy, very often saturated markets" (Puumalainen & Sundqvist, 2005, p. 23). Similarly, Chen and Wu (2005 p.137) observed "while there is no denying that the world market has become more integrated than ever before, national competitiveness remains a valid research topic inasmuch as borders exist and political, economic, and cultural institutions differ between nation states".

From the foregoing the need for assessing the robustness the model in new environment is obvious for the following reasons: first, most studies are conducted in perfect competitive market with tangible technology in developed economies; second, there is evidence that state of the socio-economy environment express in political stability, per capita income affect, culture among others affects diffusion of telecommunications services, especially since there is inconclusive and somewhat contradictory results on

culture; third, operating in developing economy entails additional cost of operation; and the quality of regulation affect diffusion of telecommunications services which is in turn influence by nation's level of development among others.

### 3. Methodology

The paper relied exclusively on secondary data. Data presented on the upper part of the table covers operators' marketing mix strategy vis-à-vis market share that covers the first stage of the life-cycle. The dataset was originally captured from operators/regulatory disclosure (see Ahmad, 2007). The lower portion of the table also borders on marketing mix effort vis-à-vis operators' share of the market in the second stage of the market captures from the same sources. A simple ranking with High, Moderate or Low indicating the level of compliance with the model was used for the review. The Five factors i.e. Core Service, Value added Service, Distribution, Price and Customer Service form the basis for measuring operators marketing effort as decomposed below:

- **Core Service** measures the offering of voice and messaging services. Variables include call clarity, SMS delivery, static/drop calls, quality MMS;
- **Value Added Services (VAS)** measures wide variety of informational, transactional and entertainment services Service offering. Variables include availability of commercial information, sport results/headlines, entertainment news, information about location area identity, Internet services, downloads (music/ring tone, movie, games, photographic, logo), stock monitoring/trading, travel services, participation TV shows, voting in SMS based contests, competitions and quizzes;
- **Distribution** measures the level of geographic coverage, service availability and accessibility. Variables include: service coverage of urban/rural areas and major road networks, service/network failure, network/service availability under extreme weather, signal strength, festivities and service availability;
- **Price** measures the amount operators charge for patronising core and/or VAS. Variables include: Tariff/bills for calls, SMS charges, pricing Multi-Media Services (MMS), access/validity time, tariff for international roaming, charges for informational services, price/bonus value-added services;
- **Customer Support** measures the range and quality of support services that accompany the offering of Core and VAS. Variables include number of languages available for support, speedy of response to request, number and spread of customer support centres, Internet based support services, range of avenue for registering complain, virus protection, warning about fraudulent schemes, notification/apology for service failures.

### 4. Operators Marketing and Market Share

In the early market (Inception to September 2006) MTN was the best compliant firm in the country, the company charges highest price, MTN charges for both local and international calls exceeds that of the other players, offers product with lowest value added services for the period under review. MTN SIM's also has low capacity for saving SMS and phone book address, for example while Airtel's (formerly Econet) SIM has capacity to accommodate 25 SMS and 250 phone book address MTN SIM only has room for 15 and 200 SMS and phone book address respectively. MTN also has the highest coverage and offers little customer support services. Another yardstick for measuring customer support service is 'friendly centers', in Bauchi State for example Glo mobile and M-Tel have fairly large offices, while Airtel had a liaison officer in the floor of First bank of Nigeria Bauchi branch, but MTN have neither office nor liaison officer. While MTN lead the pack for compliance, Glo mobile is obviously the follower for example it ranked moderate in Distribution. Airtel rank third in all, with low score in customer support service. With low compliance score ranking in two areas (Price and Distribution) and high score in customer support services, MTel rank last in overall compliance with the model in the early market. Going by the model, MTN the best compliant firm is the market leader, followed by Glo, Airtel and MTel in that order. With high customer service, product quality and variety as well as low price Airtel & MTel implemented the model's recommended marketing effort for the middle stage, when clients/adopters where are price sensitive, requires extensive customer

support services and wide variety of value added services. In the early market the review suggests a positive relationship between compliance with TALCM and market share of GSM operators.

Early Stage (Inception to 2006)						
Decision Line	MTN	Glo	Airtel	MTel	EMTS	CDMA
Core Service	Low	High	High	Moderate		
Value-Added Service	Low	High	High	Low		
Distribution	High	Moderate	Low	Low		
Price	High	Moderate	Moderate	Low		
Customer Service	Low	High	High	High		
Market Share Source: MobileAfrica (2006)	41%	29%	24%	04%		02%
Middle Stage? (2007-2010)						
Core Service	High	High	High	Moderate	High	
Value-Added Service	High	High	High	Low	High	
Distribution	High	High	Moderate	Low	Low	
Price	Moderate	Moderate	Moderate	Moderate	Moderate	
Customer Service	High	High	High	Low	High	
Market Share Source: NCC (2010)	41%	23%	21%	0.4%	2.6%	11%

Table 1: Marketing Mix and Market Share of GSM Operators in Nigeria

The middle stage (2007-2010) reveals a kind of marketing effort convergence especially for MTN, Glo and Airtel except that Airtel still rank moderate in terms of Distribution. EMTS the last entrant to the market also mirror that of MTN and Glo except in Distribution. MTel rank lowest in compliance in the middle stage as well. The market share shows little change except for the huge inroads made by CDMA operators and EMTS outperforming M-Tel. In the middle stage it is difficult to attribute share to marketing effort especially for MTN and Glo. However, the model also proved effective in the middle stage when the two extreme performers are compared i.e. MTN and MTel.

## 5. Conclusion and Limitations

The paper suggests despite unique operating environment characterised by strict regulation, oligopolistic market, developing economy, intangible offering compliance with the prescript of the model is directly related to the market of GSM operators in Nigeria. To this end the research support Jenkin's (2001) global cultural convergence view. Perhaps the seemingly oligopolistic market advantage to the operators is wiped away with the cost of operation in developing economy as well as high customer confusion in the industry. However, conclusion of this paper should be interpreted with great caution. First the traditional weakness of the model's oversimplification; the ranking process is difficult especially since different operators disclose not exactly same category of information; deliberate non inclusion of promotion as one of the marketing factors (because of measurement issues) despite the fact that it is a key feature of GSM marketing strategy. Nevertheless the research provides exploratory support for the viability of TALCM in new market.

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