mCommerce Challenges and Solutions for Developing Countries: A Case Study of Ghana

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ABSTRACT: Mobile Commerce (mCommerce) is an up-and-coming business model which refers to the process of buying or selling of goods and services which can be done by the use of mobile devices. Mobile devices, access to internet on mobile devices are growing rapidly than their counterpart. Some uniqueness of mobile networks has made them more attractive for developing nations and also for countries who wants to upspring countries who are leaders in ICT. Companies from developed nations and also developing nations are swiftly integrating mCommerce technology by utilize mobile communication facilities into their business structure. This research work focus on how mCommerce is impacting the economic or business activities, challenges, and solutions for developing countries.

KEYWORDS: mCommerce, Mobile Device, Business Model, eCommerce, Developing Countries, Communication, Developed countries.

I. INTRODUCTION

Information and communication technologies (ICT) are swiftly changing. Mobile phones have become one of the innovations of Information and communication technologies. With use of newest ICTs, mCommerce has grown to be a part of our everyday life. It provides information anywhere and anytime. It increases the relations between a business and a customer. Internet is the foundation for mCommerce. Market statistics on research industries have shown big market for mobile service which tend to modify the user's activities to M-decade [22]. Innovation of wireless networks and mobile technology, a fast growth of technology motivated businesses are moving into the mCommerce platform. Although the term wireless and mobile are used interchangeable in mobile applications. However, there is a little distinction between both terms. Wireless means conveying data via airwaves to the user [2] while Mobile refers to applications which are developed for users [2] This justifies the fact that every mobile application is not a wireless application.

mCommerce is the type of eCommerce which is done with using mobile device through possible transactions over a wireless telecommunication network [31]. The importance of Mobile internet is that user(s) can connect anytime, at every area to internet. Mobile internet promoters assert that mCommerce will surpass eCommerce in growth rate due to the enhanced features available on mobile internet. The key factor of mCommerce is to provide added satisfaction for the customers. Most people prefer to use mobile internet rather than the counterpart in Japan. Growth rate of mCommerce has been promoting to be key application for enterprise and user(s). Currently, enhanced established wireless and mobile infrastructure have made possible eCommerce transmitted from an era of wired network to an age of wireless network, with customers performing eCommerce such as eBanking or buying products can now be done using mobile devices to perform various eCommerce activities without. This method of performing business is called mCommerce which is a division of eCommerce [13].

mCommerce which is an enhanced type of eCommerce posses issues/challenges like every other new technology. mCommerce technologies rely on telecommunication facilities, which rely also on eCommerce, eBanking and payment procedure of a country. Network securities, legislation of a nation are major challenges in implementing mCommerce [27]. 'Several studies in mCommerce focused on how business will develop the right strategy to support these services with an in-depth knowledge user's perspective' [15]. The major issues encountered by mobile network service providers are related to policies and administrative irregularities. This has created several problems, e.g. issues of pornographic service provider enforcing subscriptions of their service to users without their approval [57].

Businesses are meant to have an in-depth understanding of customer's need with good customer relationship management (CRM). CRM simply can be defined as the management of customers by organization. It has become a business strategy, improving organization's competition by making a winning strategy for the understanding of customer's needs, promoting organization growth and upholding each customer, improving their expectations, reliability and happiness

[52]. The trust of every customer is a key factor for the growth of mCommerce.

A. Aims and objectives of study

1. Pattern of global diffusion of mCommerce technology in developing countries.
2. Factors that impact the flow of mobile technology and mCommerce in developing countries.
3. A framework of future development.
4. To investigate the issues facing stakeholders which includes; mobile network providers, service operators, government and users of mCommerce in developing countries.

B. Scope of the study

In developing countries are mobile network operators to service mobile devices, wireless communication and also mobile payment which the players are the banks and each of them face challenges which normally prevent them from contributing to the economy effectively. Within the context of this study, the focus is on the mCommerce challenges and solutions for developing countries.

Sequel from above the researcher focused on selected mobile operators, banks, and fishing/farming community and government bodies' governing the sectors.

The research questions and objectives have guided the research methodology, focused on the purpose of the study.

II. LITERATURE SURVEY

Wealthy and deprived countries vary greatly in their ability to access, deliver, and exchange of information through digital form. A mobile network was touting to be an 'up springing alternative' which will allow the technologically deprived areas of the world to bridge gap that separates them. Thus, according to [21]:
Growth rate occurs in the course of up springing potential inbuilt in the technologies.

At the initial stage, mobile phones circulated swiftly in rich nations and widened the gap between developing nations [51]. In developing nations, mobile communications has experienced high growth rates. Statistics from network subscribers in Africa as at 1995 to 2001 registered a growth rate of 82.1 percent compared to 47.8 percent of the world with a margin share of world market increased from 0.7 percent in 1995 to 2.5 percent in 2001in mobile sector [30] and Asia's share was an increase from 25 percent to 35 percent [30]. However, in developing countries, large percentage of mobile devices are been afforded by the relatively poor people [19].

A. Proposed variables

mCommerce adopters, Network operators (Mobile), Payment operators (Bank), Government are variables in the adoption of mCommerce. mCommerce adopters, adoptions as consumers, adoption as network members are the three roles that need to be considered when investigating individual's adoption of mCommerce services.

Mobile network operator which can be called as wireless network service provider or mobile network carrier; provides wireless communication service to deliver services to a user including radio band allocation, wireless network facility, back haul facility, billing, and client care.

Payment operators refer to payment services in which the players are banks, under financial regulation. Since the focus is on mobile payment, a client can now use mobile device as payment platform for a wide range of services or hard goods instead of using cash.

Governments' readiness to invest in mobile sector and open market for competition, in turn, is influenced to some extent by view of aptness, value of mobile devices for various economic sectors. Several government bodies still see these devices as extravagance items suitable executives and well heeled citizens; and have become a key problem in bringing mobile infrastructure to developing regions [33].

III. RESEARCH METHODOLOGY

Justification for the basis of the selection and method used to achieve our study where presented here.

In study of an occurrence, a researcher finds himself about key challenges such as, the necessity to study the occurrence, the kind of knowledge which is to be developed, the most excellent way to gain knowledge and the benefactor from the study. [14]. Tentative studies are important means to help in identifying occurrence; seeking new perception; and to assess occurrence in a new light [45]. Tentative studies are principally useful approach when a researcher wishes to increase the understanding of an issue [46].

Qualitative and Quantitative approach offers two distinctive methodologies for the procedural course of action. The two approaches are unique to each other. Qualitative research is distinguished from Quantitative research in the sense that, while Quantitative research is concerned with occurrence; Qualitative research is concerned with conceptual uniqueness of an event.

Although some social science researchers recognize qualitative and quantitative approaches as contrary [32] [47], while others believe that a skilled researcher can effectively combine both approaches [38].

In this research, qualitative and quantitative approach was followed. Our drive stern out from the fact that this approach is characterized by flexibility, which enabled us the possibly to change focus by accumulation questions. Moreover the aim of study was to get deep knowledge in the areas where challenges are met, thereby making use of the analysis of the theories [14].

A. Sampling

There are presently six mobile network operators are in Ghana based on our initial study (MTN Ghana, Vodafone Ghana, Airtel, Tigo, Globacom Ghana, and Expresso Ghana). We approached and use all of the six companies. At least two people were interviewed from each company. In the Service area, we focused on mobile payments which are the banks. The leading banks currently in the country are; Ecobank Ghana, GCB, SG-SSB, Standard Chartered, UBA, Zenith Bank, UNIBank, and Barclays Ghana were approached for interview.

The farmers and fisherman group leaders in various parts of Ghana were interviewed. At least one farmer or fisherman group from the six regions out of the ten regions in Ghana. Eastern region, Volta, Central, Greater Accra, Northern and Ashanti region. Officials of the National Communication Authority (NCA) were met to request for needed data.

All the respondents were interviewed at least once in their offices with the exclusion of some randomly selected farmers/fishermen and small business owners.

1. Result from fishing/farming sectors in Ghana

Out of the four different districts, four fishing batches where selected from three different regions. The four fishing communities, two farming communities respectively where some form of mCommerce is adopted (which are the MTech Fishing/MTech Farming respectively) and fishing/farming communities which no telecommunications (mCommerce) exist (which are the Non-MTech Fishing/Non-MTech Farming). Every fisherman in their different communities belongs to an association. (Fig. 1) Explains the non-MTech (business model) group of farmers/fishermen. This model involves mediators between the farmers or fishermen with the market which hinders them from having straight contact with the markets. Other challenges are the lack of communication facilities in these areas to alleviate the communication.

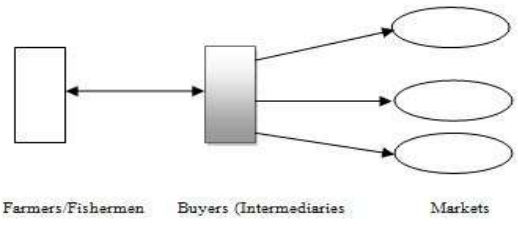

Figure 1: Non-tech category of Farmers and Fishermen (Business Model).

The Fetteh fishermen associations in central region (Gomoa) and Akomadan vegetables farmers (Ashanti region) are in this group. The model in (Fig.1) above is unidirectional in that the buyers form the key center point. The middlemen state the rate of flow in the trade. Although when there are different middlemen, processes are same.

Some of the responses from farmers and fishermen are presented in these section that are under the Non-MTech (business model) i.e. not having access to communication.

A respondent affirmed:

'Many times buyers purposely come to buy our produce to sell without bringing money before they will send us our money. Sometimes they take more than one week before they return to pay' [1].

'Some days we come home with a lot of fishes while other days will can return home empty. When we wait for buyers and they don't come, we usually smoke the fishes but the smoked fish don't give us more money like the un-smoked once. Effort is usually made to sell our fishes un-smoked and it saves us time to repair our fishing' [10].

Another respondent affirmed *'The major problem we have now is our harvest losses because we do not have any storage space to keep as much of our harvest and also we don't have any means of contact with our customers or our potential buyers. By the time some of our customers come here, too many of our harvested produce have gotten spoilt. Leaving your farm for some days to go to the city to sell is not easy.'[1].*

The benefit of use of mobile phone with their business, one respondent affirmed,

'Mobile phone has helped us to get in touch with more buyers, giving us more market choice. We are able to observe daily prices around the major markets which enable us to contact buyers in those markets where the prices of produce are higher. With using our phone, potential buyers can call us to know the type of harvest we have and the quantity at ground, negotiate with us even directly from our farm without them travelling long distance to come here '. [1]

Buyers request for information about the catch of fishes from the fishermen through the use of their mobile phone. The fishermen gives them feedbacks and buyers pay through the bank of the fisherman, the paid fishes are sent to the buyers after confirmation from their banks, this methods of business transaction has been adopted by the fishermen groups in the central region of. Below are affirmed responses from the adopters of these business model (MTech).

'Now when my fishermen have gone to the sea for some catch, I can easily gather information on the quantity of

the fishes caught with the use of my phone, find out about the different prices in the market and then negotiate price with my buyers through phone conversation' [8]

A buyer affirmed:
'I have been in this trade more than 15 years now. I get to travel a lot of distance right from Accra to these places and back. Many a time I get to go to these places about two times a week moving on this very bad road. Sometimes I travel with big sum of money. My mobile phone has helped me a lot since I can do all my negotiation on phone and my goods are brought to me. And when I get my goods, immediately i do a bank transaction to pay the fishermen.' [7]

'He affirmed their profits have gone very high in the past few years. This is because they no longer use middlemen but can sell their proceed directly at the market by getting in touch with their buyers with use of their mobile phone which has helped them to expand their businesses and getting new fishing tools and employing more.'[9]

2. Result from network service operators in Ghana
With diffusion growth of 59.7 percent, Mobile statistics has recorded a growth rate of 15,804,608 subscribers in Ghana as at the end of February 2015 to 16,106,218 as at the end of March, 2015.

MTN's subscribers:
As at the end of March were 7,778,925 subscribers as compared to the February 2015 with a statistics of 7,660,483 which represents a growth rate of 1.55 percent with market share of 48.30 percent at the end of the month under review.

TIGO's subscribers:
As at the end of March were 147,811 subscribers with a total statistics of 2,451,350 from February's figure of 2,303,539 which represents a growth rate of 6.4 percent with market share of 15.22 percent at the end of the month under review.

AIRTEL's subscribers:
With total subscribers statistics of 2,258,268 as at March 2015 was a base increase from February 2015 with statistics of 2,206,603, representing a growth rate of 2.3 percent with mobile data market share of 14.03 percent.

EXPRESSO subscribers:
As at the end of the month was an increase of 39,571 subscribers under review as compared to their February 2015 statistics of 36,301 subscribers which represents a growth rate of 9.01 percent with a market share of 0.25 percent.

VODAFONE's subscribers:
There was a decreased of 6,989 subscribers, representing a 0.24 percentage lost with a market share of 18.3percent. February 2015 subscriber statistics of 2,954,125 decreased to 2,947,136 subscribers at the end of March.

GLOBACOM's subscribers:
From February's 2015 statistics of 643,557 with March 2015 ending of 629,968 was a decrease from subscribers resulting in market share of 3.91 percent for the month. [36]

3. Results from payment operators in Ghana
Banks with partnership with telecommunication offers their customers the opportunity to carryout banking operations with the use of their mobile. A typical example is the SG-SSB Sikatext.

'The sikatext is an application designed to SSB customers who uses MTN Ghana SIM to swiftly connect to the bank through the MTN Ghana TXT feature by subscribing to the service which gives them grant to:

a. Get their current account balances.
b. Request for Bank mini statement of their account
c. Enquire latest exchange rates
d. Recharge their Prepaid MTN Ghana SIM with calling units' [44]

Banks	Mobile Banking	Internet Banking	M-Payment	Credit card	Debit card	Payment at Real store
Ecobank Ghana	Yes	Yes	Yes	Yes	Yes	Yes
Barclays	Yes	Yes	Yes	No	Yes	No
GCB	Yes	Yes	Yes	No	Yes	No
SG-SSB	Yes	Yes	No	Yes	Yes	Yes
Standard Chartered	Yes	Yes	Yes	No	Yes	Yes
UNIBANK	Yes	Yes	Yes	No	Yes	No
Zenith Ghana	Yes	Yes	Yes	Yes	Yes	Yes
UBA Ghana	Yes	Yes	Yes	Yes	Yes	Yes

Table 1: Payment Operator's services for mCommerce in Ghana

4. Results from IS (Information Services)
'Currently 60 percent of mCommerce applications in Ghana are being enjoyed by Information services with the input of wireless communication in the area of information services has been extraordinary.' (Respondent, Ministry of Communication Ghana, 2015)
390 FM radio stations spread across Ghana and out of this, 309 are currently operational which are as follows:

a. 37 Local Public radio stations
b. 63 Community radio stations
c. 17 Campus radio stations and
d. 273 Commercial radio stations.

The total number of TV operators authorized by the National Communications Authority (NCA) in Ghana as at the second quarter of 2015 stood at 58 which are made up of:

a. 21 stations are Analogue Terrestrial Television (free on air),
b. 19 Satellite Television Broadcasting (Free-To-Air Direct- Home single Channel)
c. 6 Satellite Television Broadcasting (Pay TV Direct-To-Home Bouquet)
d. 6 Satellite Television Broadcasting (Free-To-Air Direct-To-Home Bouquet)
e. 4 Digital Terrestrial Pay Television (Service and Frequency)
f. 1 Digital Terrestrial Pay Television (Service only) and
g. 1 Digital cable Television.

30 stations were on air as at the end of June 30th, 2015 and all reporters from these stations are provided with mobile stations to enable them file online reports from all over the country and abroad. [39]

IV. DATA PRESENTATION, ANALYSIS, DISCUSSION

In section we will be looking at the following three study questions:

a. Benefits of mobile phones to customers in developing nations?
b. Elements influencing penetration of mobile devices and its uses?
c. The mechanisms available to control and accelerate the penetration pattern of mobile phones?
d. Issues/challenges in mCommerce

A. Mobile eDevelopement model (MED)

Fig. 2 shows the Mobile eDevelopement Model. The reason for using the MED is because the capability and readiness to use mobile devices, its benefits are influenced by some factors in the environment. It includes political factors, cultural factors, and economic factors.

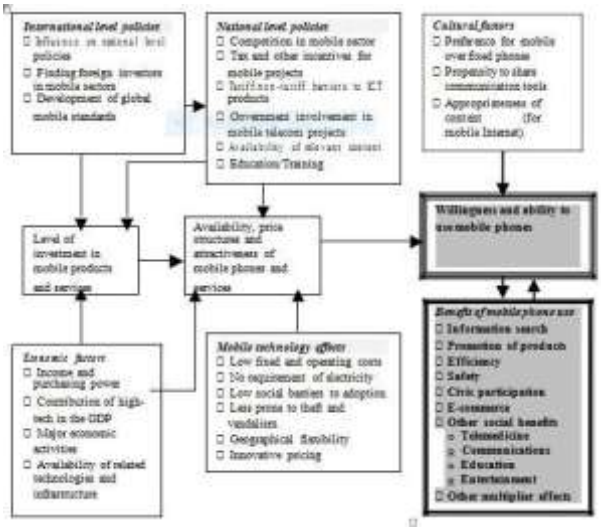

Figure 2: MED Model

B. Elements of the Mobile eDevelopement model

1. Mobile communication Benefits

In developing nations the important usage of mobile devices has been in searching for formation. Information gathered by mobile devices are been used by business owners to compact the position of buyers, reducing the threat of their revenue margins from bigger organizations of developed nations [20]. In Bangladeshi, farmers are able to find the suitable prices of vegetables and rice. Similarly, in Côte d'Ivoire some group of small farmers share mobile phones so they can follow the international market fluctuations of prices in coffee and cocoa and can sell their crops when the prices are favorable to them. Some years back, options of finding information on market direction was only from the capital city which were mostly gathered from the different buyers [33]. Fishermen group in India use their mobile device to gather facts provided on the prices of fish at the different terminals before making their resolutions of places to market their fishes [41].

Secondly, it has helped owners of company of under-developed nations in advertising their products, connecting with their clients successfully. For instance, many small businesses in Southern Asia put out some homemade signs on the street with their phone numbers showing the services they offer ranging from house painting to gardening [19].

Thirdly, mobile devices have continued to efficiently enhance competitions among small owners of business. For instance, in Kampala of Uganda, mobile devices have made taxis more resourceful. [55].

Fourthly, in Senegal during the year 2000 elections, mobile devices were employed in eGovernment and community participation, for example, reporters from FM radio stations provide phone numbers to better their interaction with their listener [33].

Fifthly, in developing nations, mobile devices are used for mCommerce activities thereby giving the ease to shop from their homes. (Ebusinessforum.com, 2000)

2. Cultural factors

Firstly, cultural factors will never be overlooked because of its influence in the rate for the likeness of mobile devices over their counterpart. [54].

Secondly, cultural factors have influenced the sharing of mobile phones amongst people in the environs. Statistics shows that in few African countries, A mobile device belonging to someone is taken to be a device for people among the neighborhood, because of the customs of sharing [33].

3. National policies

National level polices in the availability and cost of mobile phone is as much a political issue. Mobile market in any country can improve the growth rate of

mobile adoption. For example, statistics shows that the competition among operators in Sri Lanka in their mobile sector has brought about to lowered cost [51]. India opened their mobile market which brought about competition and the after effect was a graphical growth in the mobile diffusion [41]. In many developing countries, government readiness to release a competitive market and also empower mobile market is as a result of their view of mobile devices as luxury items suitable only for top earners, thereby becoming a key barrier in taking mobile facilities to areas which are less developed [33].

4. International policies

According to Montealegre in the Technology adoption in less developed countries on his journal on Management Information System described that International organizations and policies can control national policy, tax, tariff challenges on the global penetration of ICT [35]. In many developing countries, there is a reduction of custom tariff on telecommunication; thereby enabling them switch their infrastructure to conform to Information Technology Agreements of the WTO [4].

Foreign agencies are assisting underdeveloped nations to find overseas partners for mobile telecommunication projects. Small business in developing countries are identifying and implementing telecommunication investment opportunity through WorldTel. [23].

5. Economic factors

In mobile sector the revenue and buying strength will decide the extents of investments. In developing countries the involvement of high technology in the Gross Domestic Product of countries determines the degree to which mobile devices are available or imported and also the use of mobile devices will depend greatly on the economics activities in the country.

C. Mechanisms for Accelerating Development through the Mobile eDevelopement Model

In bridging the digital divide, the policy makers have to break the drip 'hierarchical pattern' [24] of technology penetration, which has favored only the developed nations.

In developing countries, if International bodies will sway the international organizations to direct their investment in mobile market, the challenges faced with supply chain can be reduced.

However, government's bodies in developing countries will need to make available incentives to support investments in mobile telecom thereby lessen the current tariff barriers on mobile IT products which will in turn give a positive impact on mobile penetration.

1. Case of GrameenPhone Bangladesh

In June 2001, there was a growth rate in the GrameenPhone subscribers with a statistics of 368,000 to 500,000 [25]. GrameenPhone which has become the largest and fastest growing mobile phone company in South Asia and the largest mobile phone company in the South Asia.

Statistics shows that mobile phone users in Bangladesh are more than the fixed-line phone subscribers. When right policies are put in place at different level, GrameenPhone case has show that the pattern of ICT penetration can be successfully overcome. In 1995, Bangladeshi government liberalized telecom sector to auction mobile phone operation rights to private firms [12]. Grameen Telecom was then awarded rights to access 300 kilometers through Dhaka and Chittagong railway lines with fiber route, which they can hook up there radio stations [50]. Although, three other overseas telecommunication companies were involved in collaboration with Grameen Telecommunication because of the ownership this rights.

International agencies where the key players in the acceleration of the penetration of the mobile phones in Bangladesh. A total of $125 million initial funding of GrameenPhone of which $60 million was loaned from four international agencies which are: International Finance Corporation (IFC), Asian Development Bank (ADB), Commonwealth Development Corporation in Britain, and Norwegian Agency for Development and Cooperation. In addition to a loan of $16.7 million, Asian Development Bank (ADB) provided an equity investment of $1.6 million. Similarly, IFC also provided a $16.67 million loan and an equity investment of $1.57 million towards the company's expansion [55].The tendency to share communications devices which is a cultural factor has become a factor impacting the penetration model of mobile devices. [6].This case has been able to illustrate the use of mobile devices to bring a ratio of changes of national income in less developed nations. [12], [40] and [53] provided some statistics of this effect of mobile devices in Bangladesh.

D. Challenges in mCommerce

1. Security

Security has become a major issue in mCommerce. When turning on a handset, a relatively secured connection through the PIN (personal Identification Number) is provided by GSM (Global System for Mobile Communication). GSM also provides an authentication protocol between handset and the network through SSL encryption of voice and data. But is not enough to persuade people. In order to get the compact of the critical mass of consumers, more is expected in to be put in security. [17].

2. Business

A major issue that companies will face as they build businesses for the wireless networks is that they have to combine capabilities and disciplines that are quite separate in most organizations today which include creative thinking, business skills, a deep understanding of technology and technical problems in both telecommunications and information systems. Executives are to think about how to handle the changes that mobile computing will bring about in the business. Absence of suitable management can bring up negative effect in the performance of business, thereby leading to failure of mobile computing.

V. SUMMARY OF FINDINGS, CONCLUSION

The focus of this master's research has been to make inquiries of mCommerce challenges and solutions for developing countries in which our findings have established that:

The offers by mobile Internet channel have brought possibilities that business once dreamed of. The gap between what the technology can do for us today and what the users has been made to expert is a big. The good news here is that the sources of consumer frustration which are slow broadcast speeds, difficult user interfaces and high costs are being looked in to by operators and equipment manufacturers.

The failure of developing nations to take the advantage of the new information and technology revolution to support its socio-economic development process will continue to marginalize and make it difficult for them to ascertain high growth rate which is necessary to achieve the middle revenue status.

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