

# **The Contribution of mobile phones to the Kenyan Economy**

**Prepared for**

**Market & Social Research  
Association**

**by Naftali Waburi**

## C O N T E N T S

Abstract.....	2
Introduction.....	3
Objectives and approach.....	4
Development of the telecommunication sector- background .....	5
Mobile phone service - what lies beyond now .....	9
Contribution of mobile telephony to the economic development of Kenya .	12
Limitations to growth .....	20
Appendix .....	21

## **ABSTRACT**

Communication is one of the most important aspect of life.

Without communication things don't work, good example being the tower of Babel, where communication breakdown killed a generation dream to reach God in physical form. The world over, there has been various ways in which the people used to communicate.

Over the last 15 or so years, we have seen a very drastic changes in the telecommunciation, a revoultion that has been dubbed as greeter than the wheel revolution.

In this paper, we arelooking at the impact of the telecommunication revolution in Africa with special emphasise on the Kneyan market.

## INTRODUCTION

Communication has its origin in Latin which means 'to share'. In Kiswahili this word translates to 'kuwasiliana' which means 'to be in touch', 'stay in touch', etc.

The need for communication is driven more by a desire by people to share and is usually done through various forms namely;

- An announcement
- A statement
- Letter
- Phone call
- E mail
- Radio
- Television
- Travel / visit

Besides the traditional use of word expressions as in face-to-face conversations, other forms have been used and still continue to be used and includes use of drum beat, flute, whistle, flag, signals, ululations and symbols.

Tele, on the other hand, is a French word which stands for 'to assist'. Telecommunication is therefore a combination of French and Latin words to give the meaning of assisting in the transmission of signals over a distance for the purpose of communication.

## **OBJECTIVES AND APPROACH**

This assessment aims at providing an understanding of the economic contribution of mobile phones to our economy.

This assessment was developed from literature review and estimates the contribution of mobile telephony on our economy, either directly or indirectly-related services on the output and employment in the Kenyan economy.

We define mobile telephony to include the process of distribution (selling), servicing of handsets including repair and maintenance, to the provision of the mobile telephone service which includes the provision of voice and data services.

## DEVELOPMENT OF THE TELECOMMUNICATION SECTOR- BACKGROUND

### a) Exploration

This began with the use of smoke signals and drums in Africa, in America and parts of Asia. In the 1790s the first fixed semaphore system emerged in Europe; however it was not until the 1830s that electrical telecommunication system came into operation.

In 1792, a French engineer, Claude Chappe built the first visual telegraphy (or semaphore) system between Lille and Paris. This was followed by a line from Strasbourg to Paris.

In 1794 a Swedish engineer known as Abraham Edelcrantz built a different system from Stockholm to Drottningholm using shutters as opposed to Chappe's system which involved pulleys rotating beams of wood.

However the semaphore system suffered from the lack of skilled manpower and high operational expenses resulting in the closure of the service in 1880.



*A replica of one of Chappe's semaphore towers*

### b) Experimenting the telegraph and telephone

The first commercial electrical telegraph was constructed in England by Sir Charles Wheatstone and Sir William Fothergill Cooke using deflection of needles to represent messages. Its operated for over 21kilometres.

Samuel Morse & Alfred Vail developed a register – a telegraph terminal that integrated a logging device for recording messages to paper tape successfully demonstrated over 5 kilometers on 6th January 1838 and eventually over 60 kilometers between Washington, DC and Baltimore on 24th May 1844.

The patented invention proved lucrative and by 1851 telegraph lines in the United States spanned over 32,000 kilometers.

The first successful transatlantic telegraph cable was completed on 27 July 1866, allowing transatlantic telecommunication for the first time.

Though the first conventional telephone was invented by Alexander Bell in 1876, Antonio Meucci had in 1849 invented a device that allowed the electrical transmission of voice over a line but Meucci's device depended upon the electrophonic effect and was of little practical value because it required users to place the receiver in their mouth to “hear” what was being said.

The first commercial telephone services were set-up in 1878 and 1879 on both sides of the Atlantic in the cities of New Haven and London. Bell held patents needed for such services in both countries.

The first Cross Atlantic connection was established using radio. 1927 However no cable connection existed until TAT-1 was inaugurated on September 25, 1956 providing 36 telephone circuits.

### **c) Experimenting the radio and television communication through telegraph**

In 1832, James Lindsay gave a classroom demonstration of wireless telegraphy to his students. By 1854 he was able to demonstrate a transmission across the Firth of Tay from Dundee to Woodhaven, a distance of two miles (3 km), using water as the transmission medium.

In 1893, Nikola demonstrated in detail the principles of wireless telegraphy. The apparatus that he used contained all the elements that were incorporated into radio systems before the development of the vacuum tube.

In 1900, Reginald Fessenden was able to wirelessly transmit a human voice.

In December 1901, Guglielmo Marconi established wireless communication between Britain and the United States earning him the Nobel Prize in physics in 1909 (which he shared with Karl Braun).

#### **d) Wireless Telephone development**

The history of mobile telephony is not clear. From available records there is one patent in the U.S.A - Patent Number 887357 for a wireless telephone issued in 1908 to Nathan B. Stubblefield of Murray, Kentucky. He applied this to "cave radio" telephones and not directly to cellular telephony as we know it today.

However, the introduction of cells for mobile phone base stations were invented in 1947 by Bell Labs engineers at AT&T and were further developed by Bell Labs during the 1960s.

In 1946, AT&T and Southwestern Bell introduced the first American commercial mobile radio-telephone service.

Mobiles used newly issued vehicle radio-telephone licenses granted to Southwestern Bell by the FCC and operated on six channels in the 150 MHz band with a 60 kHz channel spacing. [Peterson] Bad cross channel interference, something like cross talk in a landline phone, soon forced Bell to use only three channels. In a rare exception to Bell System practice, subscribers could buy their own radio sets and not AT&T's equipment.

In 1947 AT&T began operating a "highway service", a radio-telephone offering that provided service between New York and Boston. It operated in the 35 to 44MHz band and caused interference from time to time with other distant services. Even AT&T thought the system was unsuccessful.

In that same year the Bell System asked the FCC for more frequencies. The FCC allocated a few more channels in 1949, but gave half to other companies wanting to sell mobile telephone service.

In 1956 the Bell System began providing manual radio-telephone service at 450 MHz, a new frequency band assigned to overcrowding. AT&T did not automate this service until 1969. In 1958 the innovative Richmond Radiotelephone Company improved their automatic dialing system. They added new features to it, including direct mobile to mobile communications.

Other independent telephone companies and the Radio Common Carriers made similar advances to mobile-telephony throughout the 1950s and 1960s.

In that same year the Bell System petitioned the FCC to grant 75 MHz worth of spectrum to radio-telephones in the 800 MHz band. The FCC had not yet allowed any channels below 500MHz, where there was not enough continuous spectrum to develop an efficient radio system. Despite the Bell System's forward thinking, the FCC sat on this proposal for ten years and only considered it in 1968 when requests for more frequencies became so backlogged that they could not ignore them.

In 1964 the Bell System introduced Improved Mobile Telephone Service or IMTS, a replacement to the badly aging Mobile Telephone System. It worked in full-duplex so people didn't have to press a button to talk. Talk went back and forth just like a regular telephone. It finally permitted direct dialing, automatic channel selection and reduced bandwidth to 25-30 kHz.

Direct-dial mobile telephone services such as Improved Mobile Telephone Service (IMTS) obscured the problem a bit more because subscriber identification was made automatically rather than by spoken exchange between caller and operator. Each time a user originated a call, the mobile telephone transmitted its identification number to the serving base station using some form of Audio Frequency Shift Keying (AFSK), which was not so easy for eavesdroppers to understand.

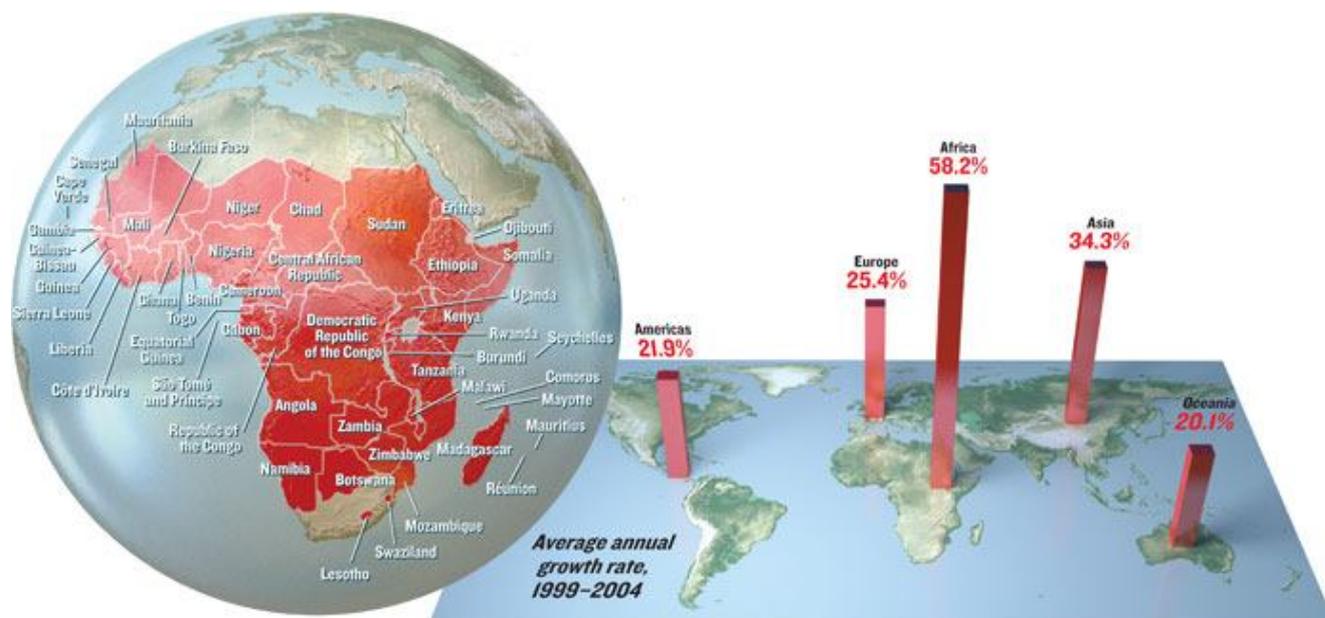
Motorola told its engineers: "We need a hand-held mobile telephone in three months." Nobody had ever made one before.

The first hand held portable cell was introduced in April 3<sup>rd</sup> 1973 in the US by Marty Cooper and John Mitchell. This was a Motorola.

## MOBILE PHONE SERVICE - WHAT LIES BEYOND NOW

There seems to be no limit to the usefulness and capabilities of mobile phones in providing solutions that meet people's needs. Its potential to grow is evident. However, the only challenge is the rapid technological changes. Its usefulness will solely depend on its ability to keep pace with technological changes.

Africa far outpaces the rest of the world in average annual growth of mobile phone subscriptions. According to the International Telecommunication Union, from 1999 through 2004 Africans signed up for cell phones at a far greater rate than Asians and nearly three times as fast as Americans. Most of that growth was in the sub-Saharan region as seen in the diagram below.



Key barrier to this growth has been the slow pace at which most African policy makers (governments) fail to enact legal frameworks and tax regimes that promote the development and growth of this sector.

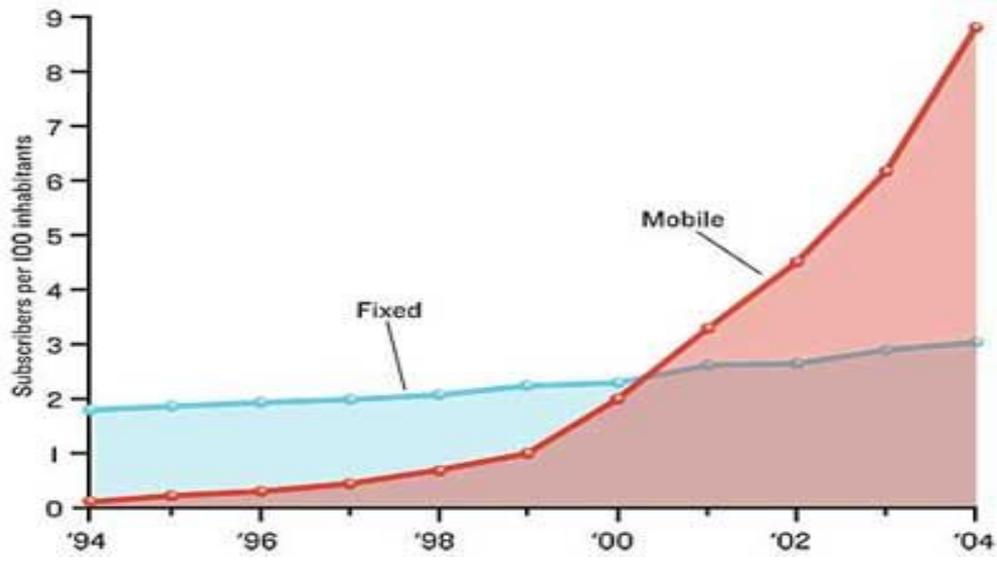
Government's involvement in both policies making as well as business has been a major barrier. Reluctance to let go government institutions (Parastatals) that actively transact business e.g. Telkom Kenya stagnated growth for a long time.

Opportunities were lost through inefficiencies and sheer malpractices and neglect. For instance in 1999 Telkom Kenya Ltd. Had a subscriber base of only 260,000 out of a population of 28,000,000 (a penetration rate of 1%). Demand for services existed but was simply ignored or neglected.



After liberalization in 1999, the new players Safaricom Ltd in which Telkom Kenya partnered with Vodafone Group PLC and KenCell Communications Ltd., now Zain, have managed to roll out and provide service that has succeeded in reaching beyond their expectations. According to London-based Tele-Geography Research, on launching its service in 1999, Safaricom expected to have 3 million subscribers by 2020 yet only in six years (2005), there were more than 4.6 million wireless subscribers in Kenya, split between the two carriers. By 2008 this had grown to about 11 million subscribers [see graph]

Currently (2009), there are 4 mobile phone service providers namely Safaricom (GSM), Zain (GSM), Orange (GSM & CDMA) & YU (GSM).



## **CONTRIBUTION OF MOBILE TELEPHONY TO THE ECONOMIC DEVELOPMENT OF KENYA**

Communication has many roles that include making contacts, exchange ideas, interact, transfer, and make consultations and to transmit information. Mobile telephone service has enhanced social relationship and businesses.

In social relationships they have helped people to be in touch by providing reliability, convenience and security which were lacking prior to this period. Now individuals who are connected can call at any time of day or night without having to move out of their house to locate telephone booth where they may expose themselves to insecurity as before. This convenience has helped save on time that would have otherwise been spend on movement which may be put to positive use in performing other household chores or even attending to other assignments that have economic value to both their business and household.

In business, the common practice has been that not everyone employed has access to office telephone. This limited employee from exchanging information at a time they desired to do so. On some occasions an employee had to disrupt business by moving out to make such calls from telephone booth. Such actions often interrupted the flow of business through inefficiency and reduced output (productivity) through lost hours.



Since the inception of mobile phones they have proved to be an important part of our socio-economic development. First, for several years running the sector has emerged to be the leading source of government revenue through taxation. In 2007 the sector remitted KShs 4.8 billion in taxes to the exchequer, accounting for slightly higher than 10.89% of total GDP.

From our observations the growth in mobile telecommunication industry has had a very positive impact on our economy and has substantially benefited the people more than any other industry before.

In terms of employment the sector employed approximately 3.5 million people, directly and indirectly from technical fields such as qualified engineers and administrators to indirect employment which has helped spread the wealth to those who don't have the benefit of education or the right connections.

One indicator of the telecommunications industry's deep penetration into the everyday economy is the ubiquitous wireless-phone kiosk (simu ya jamii), where customers can rent mobile phones by the minute. Cheap to set up and lucrative to operate, kiosks often provide a family's sole income stream. Owners initially invest about \$100 to build a small shack and to buy a handset and charger, an expense of \$40 to \$60. The SIM card and activation could cost another \$10 to \$20. Hawkers on the other hand often forgo the shack and instead carry handsets on lanyards around their necks, finding customers as they stroll around marketplaces.

Another element that has proven to be a success is the mobile charging business. In a study carried out in 3 different locations in Kenya in the 2005, mobile charging services were found to be a major source of business in Kendu Bay (Nyanza – charging cost KShs. 30 per charge), Njabini (Central – KShs. 20 per charge) and Tharaka (Eastern – KShs. 20 per Charge). This clearly shows how the cell-phone has penetrated even the rural parts of the country creating numerous opportunities.

There other areas that are directly benefiting from the mobile phone penetration in Kenya. Key example includes the following;

- Advertising agencies
- Media (electronic & print)
- Printing firms
- Marketing Firms
- Promotion firms

Its worth noting that Safaricom is one of the highest media spender in Kenya and also has overtaken East Africa Breweries Limited (EABL).

Through mobile telecommunication making phone calls has been made easy, no wastage of cash on faulty telephone booth and the fact that calls are cheaper. Initially in Nairobi for instance commercial international calls were made at Extelcoms House in City centre where long queues could be seen for people aspiring to make calls for which they had to book prior to making those calls. Affordable handsets and call tariffs have made it possible for many people to get connected and call at their convenient times and locations.

Kiosk owners and hawkers alike have benefited through increased earnings. For example hawkers and kiosk operators earn as much as \$400 per month, much more than what some people employed in white collar jobs earn. The sale of prepaid recharge vouchers and mobile telecommunication accessories is evidently everywhere as opposed to other businesses, an indication of high penetration. Most convenient stores also do brisk business selling prepaid phone cards to motorists. All these activities help to generate more cash in extra revenue for the operators.

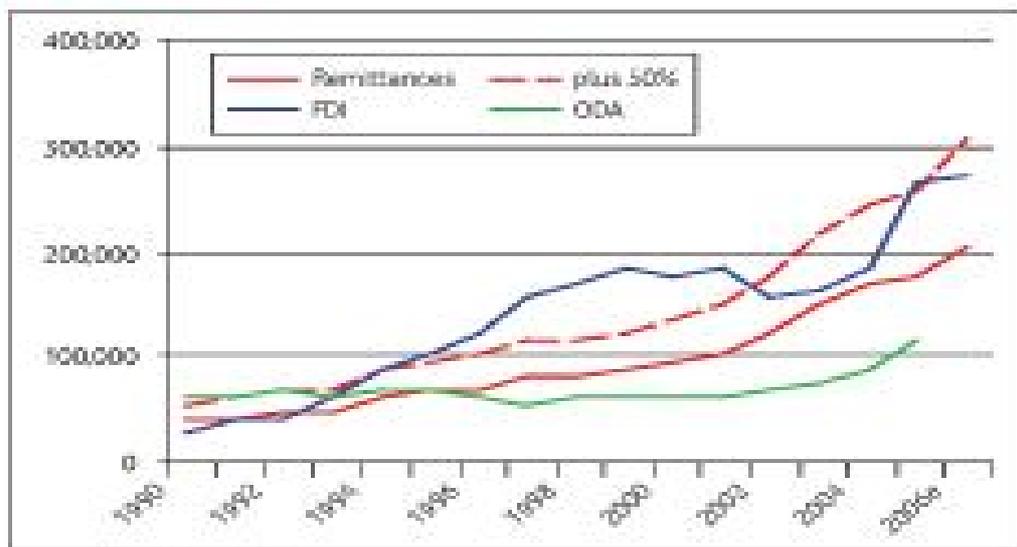
Mobile phone repair business has also increased same as mobile phone competitions by different service providers and other players in the industry.

However Safaricom and later Zain have brought a new dimension to the mobile phone industry, with the introduction of money transfer business. It's interesting to note that by February 2009, there were more than 4.5 million accounts for MPesa more than the total number of accounts in the banking sector. With the Entry of Zap the money transfer business for Zain, the service can only get better and bigger.

Coupled with this is the M-Pesa and Zap service, Me2u and Sambaza. The African community has socialism as one of its pillars whose key principle is sharing. This is practiced in Kenya through various forms that include harambee, chama, etc. Zain and Safaricom have been able to build on this to come up with products that works along similar lines. Through technological innovation both companies have brought financial transactions services to the people and sharing airtime through electronic transfer.

In a survey on money transfer in Kenya the study found that money transfer was an important feature of the Kenya economic system and a critical financial need for many people (see figure 4). In this survey, 17% of respondents had sent and received transfers from within Kenya. Of these 28% listed transfers from family or friends as their main source of livelihood. The most popular means of transferring money was via family member or friend or via a bus company or "matatu".

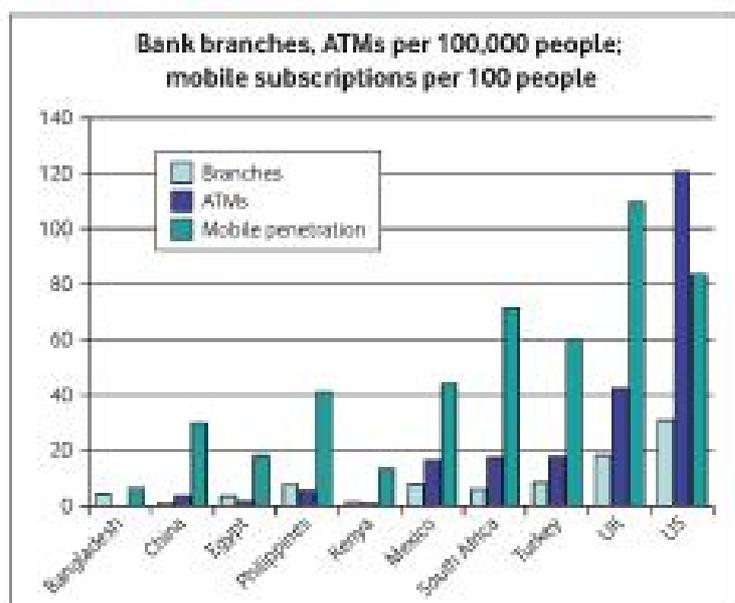
**Figure 4. Financial flows to developing countries 1990-2006, \$000.**



Source: World Bank/IMF

M Pesa came in at an opportune time. This transfer service now enables the sender and receiver to transact business at their convenient time and location as opposed to the traditional methods as above or use of mainstream banks which operate in exclusive locations (19% penetration, urban) and time of day. Added to this is the benefit of low charges for using the service. A sender uses a fixed sum of money as little as KShs 35 to send money amounting to KShs 10,000 whereas banks charge exorbitantly. Mobile telecommunication cash transmission is instant as opposed to bank transfer which takes time. Subscribers to this service have grown to about 5 million customers within two years of launch. Banks too have been beneficiaries of increased mobile telecommunication penetration. Banks are increasingly using the broadband services of mobile telephone operators to open up and operate branches in areas they would have hitherto not done so before.

Figure 1. Number of bank branches and ATMs per 100 people, selected developing countries.



Source: World Bank

The low income and the poor depended more on the Kenya Post Office for cash transfers. Operations at this institution were known to be inefficient with some reported cases of fraud. Telkom Kenya too wasted approximately KShs 4 million monthly through cable vandalism and maintenance costs. The switch to wireless CDMA technology has helped curb these costs besides ensuring that the service is on and running all day everyday. M-Pesa and Zap are very efficient with no fraud. This implies individual users are able to transact business within time and saves cost. This service has further been enhanced to include other services such as buying e-money, paying bills which include wages, hotel bookings, cab, etc. For instance, Jamii Bora, an MFI institution now transacts some of its business through M Pesa. Others include collecting cash through Pesa Point ATM's. This has helped enhance security.

With the government's ambitious rural electrification program the question of electric power which is key in the operation of mobile phones is slowly being addressed which in the long run will increase penetration and connect individuals

and businesses to the rest of the world and, most important, to each other. It's a giant step on the long road to development.

Benefits of mobile telecommunication are innumerable in Kenya. From the point of operating costs business are now able to send and receive data through a click of a button on their phone. Increased internet use has been achieved through the introduction of the 3G operating system

News updates via text messages on local and international news, sports scores, horoscopes, movie listings, inspirational quotes and election updates are other benefits the subscriber can get for a fee of Kshs 10 per message. This service ensures people get news updates without necessarily having to watch television, listen to radio or read newspapers.

The rate of service usage has a direct correlation with income level. Increased connectivity and service usage, therefore increases government revenue through tax payments from the industry whose benefits include income redistribution and trickle down to the community through increased government expenditure on development and recurrent expenditure e.g. on schemes such as CDF, free public schools education, road construction and maintenance, input subsidies on agricultural production, drilling boreholes for the provision of water to villagers, free primary healthcare, etc. Savings from these schemes by individual beneficiaries boost family income or subsidizes where this is lacking

Despite telecommunication being the fastest growing sector in our economy and the clear opportunities available to mobile phone operators, penetration is still low and stands at 37%.

There are social benefits and challenges too. Mobile phones have been used in community policing, poll-watching and even in creating, building and managing relationships. However, it has been impossible to quantify the impact that these social networks have on the community.

Mobile phones have also been targets of theft by street urchins and car jackers.

## **ROAD TO SUCCESS FOR RESEARCH FIRMS**

The competition in the mobile phone industry only getting stronger, research firms have benefited immensely.

Market research has been conducted

The benefit comes from both the service providers as well as other players such as the hand set manufacturer.

It's this unprecedented growth that has brought about the development of affordable handsets (some costings as low as US\$ 20)

## LIMITATIONS TO GROWTH

It is important to point out here that in as much as we view this boom in telecommunication business with enthusiasm it is also necessary that we look at the other extreme end of it with caution. There are many areas that we need to look at namely;

- 1) Our tax regime has been the biggest barrier to realizing even bigger growth. This service is not a luxury as is currently treated.
- 2) Stiff competition is reducing stock turnover and leveling off profits for individual business operators. For instance some retail vendors, especially hawkers, hardly make ends meet through their effort.
- 3) Rapid technological changes are a threat to capital investment and business growth. This serve as a barrier for investors since capital might easily be rendered obsolete within a short time e.g. Simu Ya Jamii, M-Pesa customers withdrawing money from PesaPoint's 110 ATMs without using ATM card.
- 4) Finally, there is the issue of capital flow. The privatization process of Safaricom has attracted both local and foreign investors. The current slump in economic activity at the NSE bourse may have resulted and continues to result in most local investors who look for short terms gains to pull out in favour of long term investors majority of whom comprise the foreigners. The benefits in the form of returns on investment to the government of Kenya and local Kenyan has been lost to foreign investors who now claim part ownership of Safaricom.

## APPENDIX

- 1) GSMA (2008). Taxation and the growth of mobile services in sub-Saharan Africa
- 2) Rural Finance Knowledge Management (August 2007, issue no. 7). Experience and Knowledge sharing. M Pesa money transfer opportunity in Kenya. Page 5
- 3) Capital Business (February 16 2009) Zap your money.
- 4) www.Africa Calling. Victor W.A. Mbarika and Irene Mbarika
- 5) www.Connected Earth "how communication shapes the world.
- 6) www.Phone Warehouse. 1996
- 7) Mobile Phone subscribers. PDF
- 8) Business Daily Africa.13<sup>th</sup> December 2007. Telkom landline gets wireless option
- 9) Card technology Africa. Safaricom, Pesa Point on money transfer deal
- 10)Global Technology forum. 11<sup>th</sup> July 2007. African M-Commerce finds a new home
- 11)www.wikipedia.com