

# Emerging Cellular Technologies and the Future

By  
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## Abstract

This paper includes information on various areas related to Global system for Mobile communication (GSM) which includes; GSM Systems Engineering and Network Management, GSM: Base Station Subsystem Engineering, GSM: Network Switching Subsystem Engineering, GSM: GPRS and EDGE Engineering, GSM: Satellite communication Engineering. The other issues discussed include a roadmap to M-commerce and globalization.

## 1. Introduction

Technology has enabled the exchange of information between men and machines through voice, image, data or multimedia which basically characterize future telecommunications infrastructure which is driving our society's dramatic transformation to information based economy

The availability of such an infrastructure enables the information that is used or passed to be simple, secure, reliable and cost effective.

In terms of service provision, regulators, Network Service Providers and equipment suppliers all aim at satisfying the telecom market demands based on the promise of providing the best services to end user, while at the same time stimulating the economy to produce more goods and services

Services as broadband communication can be availed through cable connections or radio waves.

The rapid expansion and developments in telecommunications, especially in industrialized nations, has transformed lives and impacted on traditional industries like, publishing, music and films in terms on how they carry out their business processes, making it the fastest growing sector in the economy.

The ability to distribute information in all forms has been in the recent years revolutionized by; speed, ease of transmission, limitless range and potential global accessibility.

Information and telecommunication technology has in effect impacted the society in various ways which includes:

- Dramatic transformation into an information based economy;
- Making the business more productive and competitive;
- It has opened up new possibilities for economic break through.

On the other hand, even the Telecom equipment suppliers, who mostly have been operating in a competitive environment, can agree that the competition is getting tougher, stronger and more brutal.

Their strategy is to provide a complete range of technologies and products required to deliver the ever-demanding customer sophisticated requirements.

Using ITU.T definition, telecommunication services can be categorized as:

- Bearer services
- Teleservices and
- Supplementary Services.

Each of these services can be identified by the networks, which allows them to be treated differently.

### **Globalization of Technology**

Today's telecommunications market segment is becoming increasingly global and major players are emerging in this market struggling to take a dominant position

This increasingly global business environment has been driving, and will continue doing so, to enable the globalization of technologies, and in particular, radio access technologies.

The selection of technology is likely to have an impact on the global strategy of each particular cellular operator.

### **Economies of Scale**

There are aspects associated with the globalization trend that will likely be determining factors for the selection of technology. These aspects that are related to the benefits associated with economies of scale include:

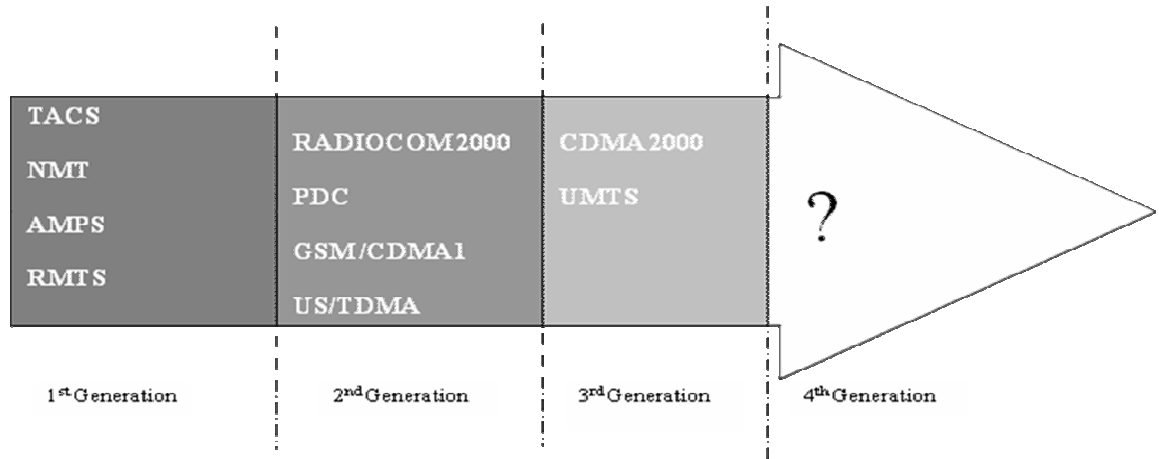
- Network infrastructure and mobile handset costs
- Speed of technology development
- Roaming and service continuity.
- Available service portfolio

## 2. Evolution of Telecommunications

Multimedia services are now gaining more importance including a huge number of applications ranging from Phone, video phone, telefax.

### 3G Evolution Paths:

Evolution paths associated with the existing 2G technologies Summary:



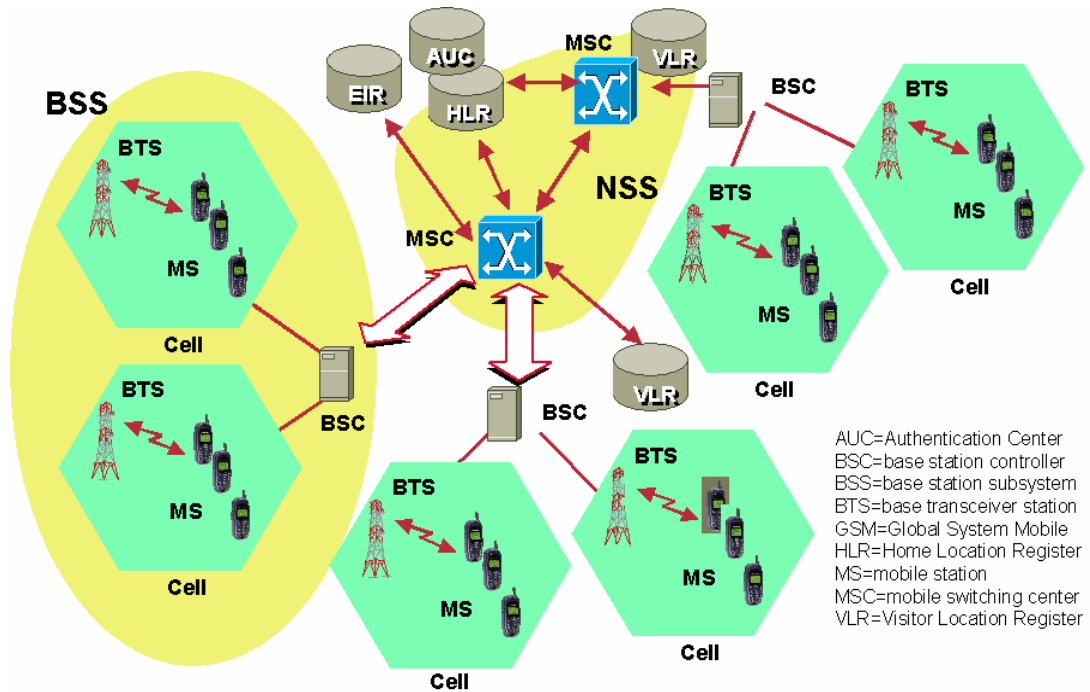
### GSM Cellular network:

Within the GSM network, analog cellular systems are commonly referred to as first generation system.

The digital systems in use, such as GSM, PDC, CDMA 1, US-TDMA and IS-136 form part of the second-generation systems.

These systems have enabled wireless voice communication in many leading markets. The customers are thus increasingly finding value in other services such as text messaging (SMS) and access to data networks (FAX) which is progressively growing.

## GSM Cellular network:



### 3. Evolution of Telecommunications

The increasing reliability in telecommunication services, the industry is now faced with challenges of providing the necessary capacity for both backbone transmission infrastructure and the access network.

At the same time, the provision of new innovative multimedia and broadband services are geared to enable telecommunication operators to gain a foothold in the market and experience a rapid growth.

#### Blue tooth and the Cellular network

Bluetooth uses the Frequency Hopping spread Spectrum and is known to form ad hoc networks, which is also known as personal area networking (PAN).

Two transmission ranges have been defined for personal area networking with the limitation between 10m to 100m without a line of sight.

Bluetooth cell coverage area is thus small which makes it a costly value proportion for operators. This is due to the fact that it adds value but does not necessarily reduce costs.

## Bluetooth applications:

Bluetooth technology can be used to connect various devices within its range as printers, PCs, Cell phones, printers, PDAs, cameras and other Bluetooth enabled devices. It allows sharing of resources, including files and access to the Internet.



## WAP in the Cellular network

Wireless Application Protocol is a secure specification that allows users to access information instantly via handheld wireless devices such as mobile phones, pagers, two-way radios, smart-phones and communicators. This allows for a standardized communication between the mobile phones and the servers.

WAP uses client- server architecture. It is especially suitable for thin clients since it incorporates a relatively simple micro browser into the mobile handset.

Some of the corporate applications that are being enhanced and enabled with a WAP interface include:

- Remote Point Of Sale
- Remote Monitoring Such As Meter Reading
- Vehicle Positioning
- Corporate Email
- Paging
- Two way radio communication

## **I-mode**

I-mode is a wireless internet service which enables mobile phone users to access mobile internet sites.

It provides a full-colour, always-on, packet-switched, Internet service for cellular phones offered by **NTTDoCoMo** (Nippon Telephone and Telegraph DoCoMo *docomo* which is translated in Japanese as, "anyplace you go" and the acronym in English is an equivalent to, "Do Communication Over the Mobile Network."

I-mode users are diverse, which include young people, middle aged and old people. It has been surveyed that there are more male i-mode users compared to their female counterparts.

## **GPRS & EDGE:**

General Packet Radio Service (GPRS) is a packet-based bearer service that is being introduced on many GSM networks. The use of packet Switching means sharing of the same resources used by various mobile users, who are charged on the basis of the amount of data transmitted, rather than the connection time as WAP.

GPRS is a development of GSM and can be implemented by Mobile operators using their existing GSM network.

### Advantages of GPRS

GPRS can be efficient as it allows customers to answer voice calls while in the middle of sending e-mails or viewing a WAP site. The data call is halted then picked up after the voice call with no extra charge being incurred.

## EDGE (enhanced data rates for GSM evolution)

EDGE is a 2.5G initiative that is yet to be realized. It sits between 2.5G and 3G although it offers the potential for packet-based services providing data rates of up to 384 Kbps

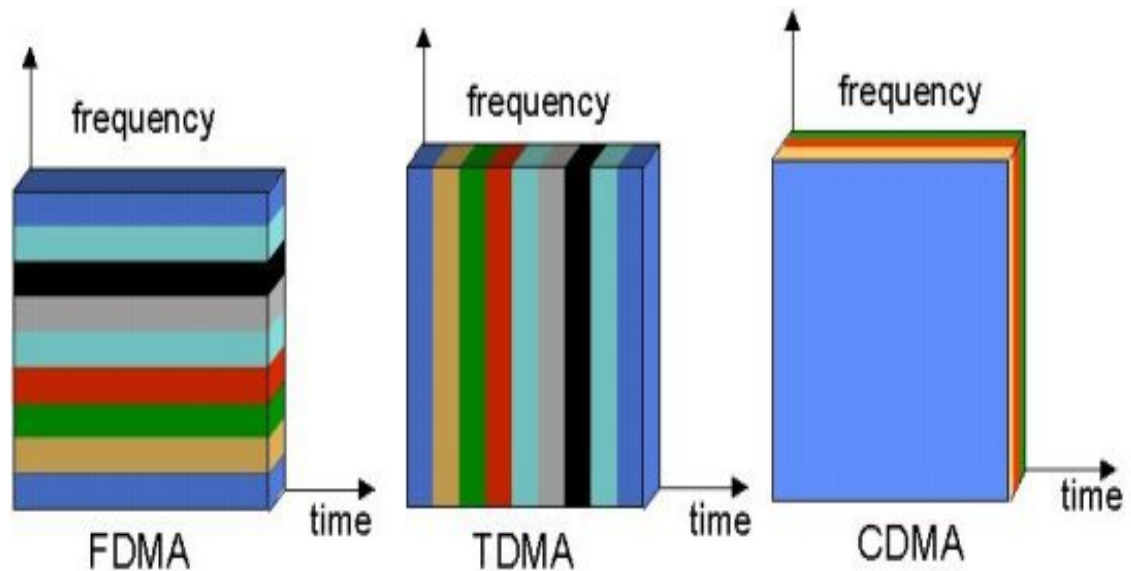
EDGE is easy to deploy and also offers high speed data packets.

## CDMA

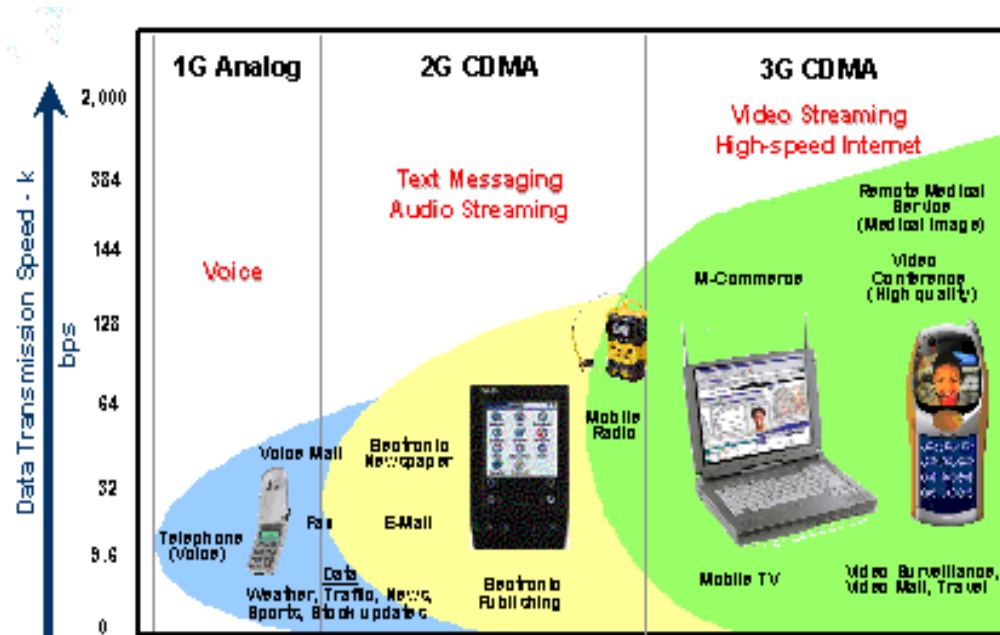
Code Division Multiple Access is a mobile technology that uses spread spectrum. It allocates for every channel, the entire spectrum all of the time, to allow for encoding of individual conversations. It scatters a radio signal across a wide range of frequencies

CDMA is the common platform on which 3G technologies are built small cell radius. It provides better capacity for voice and data communications and allows more subscribers to connect at any given time.

### ACCESS SCHEMES:



## Future Proof Technology:



11

The operators here have yet to grab the imagination of the market. Fortunately, mobile penetration is higher than the Internet penetration in every market, with the exception of the US, this fact might aid m-commerce, and this should help drive demand for m-commerce services.

As the world knows, we are moving from 2G to 3G through 2.5G (in some sense). One important issue to be visualized is the extent to which end-users are prepared to pay for the ability to transact business using their mobile device.

Payment plans have to be devised which are less susceptible to fraud.

3G infrastructure rollouts will take time especially for Africa, where it may start off in the year 2014 however, we need to adequately prepare customers for the impending changes in business world.

### Crypto Smartphone

The crypto smart-phone uses a symmetric 256 bit cryptographic algorithm and Windows CE (Enhanced Real-Time) operating system. It has a platinum body. The Ancort logo and the navigation key are made of 18 carat rose gold; its navigation key carries 28 round cut diamonds. The leather carrying case with platinum trimmings and lock, when the case is opened, it plays music and the music can be changed to the client's choice.

The phone uses a powerful encryption technology to provide added security. The level of encryption will provide secure protection of information against kidnapping, technological blackmail, financial racketeers and corrupted state officials

### **Crypto Smartphone**



### **4. Conclusion**

The mobile phone has become part and parcel of life for many. It continues to be a key tool of communication. With the emerging technologies and ever expanding innovations, life promises to be even better for telecommunications technology consumers.

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**Cite this article as:**

Fares, A. (2007). *Emerging cellular technologies and the future*. In M. Kashorda, F. Acosta and C. Nyandiere (eds). *ICT Infrastructure, Applications, Society and Education: Proceedings of the Seventh Annual Strathmore University ICT Conference*. Strathmore University Press: Nairobi