Evolution of 3g technology

3G: Sophistication Guaranteed

Telecommunications evolution is undergoing a rapid vamp to the future; the evolution is almost exponential, from the analog types to 2Gs and then finally the latest mobile innovation the 3G technology. The 3G techie is the latest on-stream line of communications which offers advanced voice communications and high-speed data connectivity, with wireless Internet access, mobile data applications and high multimedia content. The 3G model embodies true sophistication in terms of mobile technology but why was this phrase used to describe it? To answer this an investigation of the roots and processes of 3G would be required.

Mobile technology's conception started from the analogs. Analog networks, or first generation wireless technology has been introduced in the mid 1980s in America, a technology that was incredibly region-specific in character. As the demand for mobile communications grew, the digital 2G emerged in the 1990s flanking the undercapacity of the 1G systems.

Second generation mobile systems operate on the following fundamentals: TDMA, (IS-54 and IS-136), GSM and CDMA IS-95 or cdmaOne. GSM, used worldwide, is a packet-switched technology that transports speed theoretically of up to 115 kbit/s. Unfortunately, these technologies were found to be incompatible with each other, and many mobile techies were incredibly delimited to a specific region or country. They are also fabricated mainly for voice data and slow transmission. Rapid changes in user expectation and communication needs, sought the need for improvement.

The resolution: a unifying digital wireless communications that would make global roaming with a single handset possible.

3G refers to the third generation wireless technology and networks and was invented in 1999 (Xavier, ?). It is actually a modified concept of 2G mobile phone systems. It is based on an International Telecommunication Union (ITU) scheme establishing for single global wireless standard called International Mobile Telecommunications-2000 (IMT-2000), a resolution to the defects of 2G system. System capacity and spectrum efficiency over 2G systems was the underlying theme of the ITU standardization systems. Minimum transmission rates was set at 144 kbps in mobile (outdoor) and 2 Mbps in fixed (indoor) environments.

(Qualcomm, 2001). Simply put, it is an improved wireless technological device for a collection of international standards and technologies intended to increased efficiency output and improved mobile wireless network performance.

Since 3G is actually a convergence, the different networks working to standardized it, may be classified as follows: WCDMA, CDMA2000, UMTS and EDGE. The variation as opposed to the standardization cannot really be resolved since there are economic forces or stakeholders who have vested interest in favor of that particular standard. WCDMA (Wideband Code Division Multiple Access) refers to broadband digital radio communications of Internet, multimedia messaging, video streaming and other capacity-demanding applications and is the preferred 3G network in Europe, Asia, Japan, United States and Africa. Conversion of input data (e. g. image, video,

voice) to a narrowband digital radio signal tagged with a specific marker is the method for multi-rate transmission of the network.

CDMA (Code Division Multiple Access) is the leading 3g network as of current providing over a hundred million consumers worldwide. It was selected as the industry standard by the ITU (International Telecommunications Union).. CDMA technology is a combination of two networking assets: CDMA2000 1X and CDMA2000 1xEV-DO. The capacity and performance of voice and data services of CDMA2000 1X is twice that of the former CDMA systems and surpasses that of TDMA and GSM.

Peak data rates are reached to about 153 kbps without intervening voice capacity. It also offers longer standby times. Its' high compatibility with the former CDMA facilitate upgrade of mobile technology to current. CDMA2000 1xEV-DO is a data-optimized version of CDMA2000 providing peak rates of more than 2 Mbps, with an average output of over 700 kbps. This fast technology is parallel to DSL service and can support video streaming data and large byte file downloads. The stipulation for CDMA2000 1xEV-DO is to delivers maximum number of data (Megabyte) at the lowest cost possible.

Being the selected technology, CDMA offers the best packages in mobile technology. CDMA builds on the former CDMA systems and improvised on it like the Orthogonal Frequency Division Multiplexing (OFDM and OFDMA), advanced control and signal procedure, improved interference signalmanagement techniques, end-to-end Quality of Service (QoS), and new antenna techniques such as Multiple Inputs Multiple Outputs (MIMO) and Space Division Multiple Access (SDMA).

The advantage of this improved packages include the following: (1) lead performance (e. g. data speed, capacity, latency), (2) spectrum efficiency, (3) advanced mobile services support (4) IP compatible (5) device selection (6) seamless evolution path and and ;(7) global/network coverage flexibility. Best of all it leads lower cost of total ownership (CDMA Development Group, 2007).

UMTS (Universal Mobile Telecommunications System) is the mobile telephone standard in Europe, set by ETSI. Unlike GSM, the UMTS follows layering protocol for data networking. The topmost, being the services layer, is for allocation and data speed. The control layer located central, assists in upgrading actions and allows dynamic allocation and tagging of data to a specific bandwidth. Bottommost is the connectivity layer where any transmission technology can be seconded and the voice traffic will transport over ATM/AAL2 or IP/RTP hence trafficking by signal bandwidth is prevented (GSM server, 2007).

EDGE (Enhanced Data For Global Evolution) allows GSM the aptitude to handle services for the 3g telephony. It facilitates data transmission at a high speed of 384 kb/sec. EDGE employs TDMA (Time Division Multiple Access) frame structure, logic channel and 200kilohertz carrier bandwidth. The same bandwidth with that of GSM sytems enables system compatibility (3G, 2006). System compatibility assures upgrade efficiency and low cost which had been the problem of most G3 networking systems (Lapping, 2006).

The constituents of 3G is vast and caters to the technological whims of the techie addicts and the businessmen all over Europe, Asia, South America and

Africa, however, like all new technologies, there has been a bone of contention among manufacturers. From the time that the idea of 3G arises and the time when it was marketed, obstacles seem to be always around the corner. As mentioned earlier, there are various networks of 3G which had actually lead to licensing disagreements arising from different terms of conditions from different parties involved.

High debts incremented by the telecommunication parties during the past years, which may actually pose as a threat to the development of 3G. Also, operator troubles are unsupported by state finance. The expenses associated with license are ghastly. The main problem of 3G all boils down to money. 3G service is new hence network coverage is limited. Also, the cost of technology is cumbersome for the commoners and the internet flat rate is high at some countries. The main problem with the upgrade of technology to 3G is that there are some price qualms associated with the introduced and advanced technology. Fortunately, most of the leading handset manufacturers like Broadcom puts an end to this entire anxious price tirade, and eventually managed to produce more 3G technologies aiming to facilitate its spread globally and probably to stimulate its economic demand. Broadcom generated the Cellairity chipset with astounding cost of $100 (Hyatt, 2007). This price resolution may, in the long run, predict to be a good start of consumer availability for 3G.

Broadcom may have initiated reduction in production cost but would other companies follow? 3G is a huge risk of investment in consumer market. 3G's sophistication actually caters to that businessman who conducts their businesses assisted by the wireless networks. Unfortunately, the turn of

events is that businessmen constitute only a small population in the global networking arena. For the sophisticated technology to be truly cosmopolitan in character it had to be used by most of the networkers and mobile-users all over the world. For now, it is strangely delimited to those who can really afford it.

Looking at the positive side of things, the situation of 3G consumer ratio would not always be the same. Like all things, needs change, and observing the evolution of mobile technology from the rustic analog model to the latest 3G types, one can only predict that consumer needs would be inclined towards technological enhancement and that technological enhancement would be better suited to the needs of the consumer.

What is more is that needs change, mobile techie trends may also change. The 3G model is now currently being improvised from more than 3G to 4G.

4G Technology: Super-satisfaction guaranteed?

Only time will tell.

References

- *3G* . (2006). 3G store. Retrieved Nov 22, 2007 from http://www. 3g. co. uk/All%20About%203G. htm
- *3G Technology* . (22 Aug 2007). Qualcomm. Retrieved Nov 22, 2007 from http://www. 3gtoday. com/wps/portal/subscribers.
- CDMA Development Group. (2007). *3G-CDMA2000* . Retrieved Nov 22, 2007 from http://www. cdg. org/technology/3g. asp.

- GSM server.(2007). *Evolution to 3G.* Retrieved Nov 22, 2007 from http://www. gsmserver. com/articles/evolution_to_3g. php.

- Hyatt, J. (2007). *Broadcom Enables 3G Mobile Phones at 2G Prices with New CellAirity™ Chipset.* Retrieved Nov 22, 2007 from http://www. broadcom. com/press/release. php? id= 815794.

- Lapping, K. (2006). *Cost and Software Incompatibility Stymie 3G Growth.* Ernst and Young Ltd. Retrieved Nov 22, 2007 from http://www. ey. com/global/content. nsf/South_Africa/06_Sept_05_Costs_software_incompatibility_stymie_3 G_growth.

- Xavier, P. (?). *Licensing of 3G Mobile.* Swinburne University of Technology. Retrieved Nov 22, 2007 from http://www. itu. int/osg/spu/ni/3G/workshop/presentations/xavier_1. pdf.