WORLD TELECOMMUNICATION DAY

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Mobile Everywhere — Hard to Make a Call Anywhere

by Abu Ahmad

NEW millennium began with a false alarm of Y2K bug when the mobile users in Bangladesh failed to make calls immediately after the midnight of December 31, 1999. They wanted to greet their beloved ones almost simultaneously. That inevitably caused network congestion and the situation became normal after a short while. The real alarm, however, remains and it has been getting louder everyday. Highest import duties on mobile handsets in South Asia coupled with the deliberate hindrance by BTTB on interconnection has not only been affecting business growth but has also been depriving the consumers of their consumer rights. While video conferencing is being done over the Internet, Telegraph Act of 1885 still governs the telecom sector in Bangladesh.

The industry, however, keeps on progressing defiantly. Mobile operators in business for seven years dominate 25 per cent of the market where GSM operators for 3 years control 20 per cent and they are expanding. It clearly reflects the 39 years old state monopoly and BTTB's lack of reflex towards the market. It is not surprising that the state owned enterprise has failed to fulfill its commitment of installing one million telephones by this year. BTTB is currently operating only 500,000 telephones. That's why three mobile licenses were issued in 1996 for the early recovery of Bangladesh from its poorest teledensity (0.40) in South Asia. That initiative was never materialised as the national telecom administrators have been doing everything possible to stall the mobile growth.

On April 29, 1998, the three GSM operators signed a revenue payment agreement with BTTB. Besides interconnection fees, the GSM operators pay the standard tariff for local, NWD and ISD calls to BTTB. The state-owned enterprise, however, pays nothing while its calls terminate at the GSM networks. The operators accepted such irrational settlement hoping for the required interconnections with BTTB's fixed network. But BTTB immediately cooked up another story of inadequate infrastructure and asked the mobile operators to develop it themselves.

BTTB sent the operators a proposal from Alcatel with a C&F price tag of F.Fr.13.8 million. The mobile operators would bear the cost of this project, while BTTB would retain the ownership. According to BTTB, 492 links (each bearing 30 voice channels) should be installed but the mobile operators would get only 96 links. Therefore, each operator would receive 16 links with BTTB's Tandem for local calls, 4 links with BTTB's TAX for nationwide calls and 4 links with BTTB's ITX for international calls. Besides bearing the project cost, the mobile operators shall continue to pay all standard interconnection fees to BTTB.

BTTB imposed such biased deal by twisting Article 3 of the operational agreement with the GSM operators. This Article says that all costs relating to interconnection shall be borne by the operator. Interconnection has been defined in Article 1.1 of this agreement as: "Interconnection means the connection between BTTB and the operator's networks for both-way transmission of telephone traffic between the networks of the two parties and for providing national and international telephone call connection to the operator's customers."

It is clearly evident that developing the fixed telephone infrastructure is in no way the mobile operators' responsibility but the contractual obligation of BTTB. If the mobile operators agree to render financial assistance to BTTB, the government must pay it back. Mechanism of the repayment is negotiable but the plan to extort the mobile operators' money is not only unprofessional but also in violation of the Public Safety Act. BTTB knows that very well and that's why they have magically created another issue by making GrameenPhone the scapegoat.

GrameenPhone recently applied for twenty E-1 (each carrying 30 voice channels) links to interconnect with BTTB exchanges in Sylhet and Khulna. This time, BTTB refused interconnecting GrameenPhone for using the nationwide optical fiber backbone. GrameenPhone leased the nationwide optical fiber network from Bangladesh Railway with the consent of the Ministry of Posts and Telecommunications. The operator has been rolling out its network through this nationwide transmission backbone. But BTTB defines it as a violation of GrameenPhone's operating license and refuses interconnecting at Sylhet and Khulna.

The government is not only endorsing the hypothesis of BTTB but also empowering the latter to keep thousands of mobile users from proper service. GrameenPhone has been victimized by BTTB as the former has been expanding its coverage in a formidable manner. Other operators shall be equally harassed by BTTB as they grow. The MOPT should intervene in order to ensure the sensibility of BTTB for the sake of spreading the benefit of mobile communications to every corner of the country.

Bangladesh had to wait six years to exceed the six-digit national total of its mobile users. Pacific Bangladesh Telecom Ltd. (PBTL), GrameenPhone, Telekom Malaysia International Bangladesh (TMIB) and Sheba Telecom enrolled 116,200 customers in October 1999. Country's first mobile operator PBTL launched CDMA services in the first quarter of 1999. It gave the customers a second choice for world-class digital mobile technology in Bangladesh. Winning this US $22 million CDMA contract helped Motorola remain in the local mobile market because all three GSM contracts were won by its European rivals. After fiercely competing with Samsung and Qualcomm, Motorola retained its vendor title with PBTL. Samsung, however, grabbed a consolation prize by supplying the handsets. It is in fact the first Asian handset vendor catering the mobile market of Bangladesh. Korean dominance on CDMA handsets continued when PBTL picked up Hyundai as the second vendor. Technical advantages of 13Kbps EVRC along with 8 Kbps QCELP are the major reasons behind PBTL's swing from Samsung to Hyundai.

CDMA is a long-term strategic option for PBTL as this technology supports fixed and mobile services from single infrastructure. Being the only operator having nationwide license for fixed wireless services, PBTL is diligently addressing the potentials. The operator contracted Fujitsu Corporation to roll out Synchronous Digital Hierarchy based microwave link over the Dhaka-Chittagong highway. Seamless radio coverage will enable the mobile customers of PBTL to keep on talking while traveling through the 220 kilometers long and most important highway of Bangladesh. Besides, PBTL will spread its coverage on both the sides of this highway through spur links. This will enable the operator to roll out its fixed wireless network throughout the areas adjacent to the highway. PBTL has primarily chosen Motorola's fixed wireless terminals to cater that market.

Leading operator GrameenPhone took a number of giant leaps in 1999. Besides doubling its 30,000 subscribers total of 1998, they made history by introducing prepaid services in September 1999. It stimulated the market immediately and the growth is very impressive. The prepaid users currently represent 16% of the GSM segment. Introduction of Short Message Services (SMS) also delivered the bounty of GSM technology. GrameenPhone introduced both way international roaming with 11 operators of 9 countries, which has lately grown to 20 operators of 12 countries. Earlier they introduced dual band GSM handsets in order to maximize the roaming advantage of its subscribers.

Highest accomplishment of GrameenPhone was connecting Khulna and Chittagong with the country's first Synchronous Digital Hierarchy based microwave radio link. It completed the circular loop of GrameenPhone's nationwide optical fiber network. This photonic backbone has empowered the operator to expand its geographical coverage to 41 districts and six divisional headquarters in 2000. GrameenPhone's targeted 100 per cent subscribers growth in this year seems extremely conservative. The operator already has an impressive clientele comprising 94,000 users and this number is expected to exceed 100,000 by the end of next month. Its village phone scheme consists of 1,600 subscribers and this award winning poverty alleviation program is being deliberately jeopardized by BTTB's refusal to provide interconnections.

Interconnection scarcity has also discouraged AKTEL and Sheba from launching any sales campaign in Dhaka during this year. The government should resolve this crisis, which has been artificially created by BTTB. Otherwise, all the rosy words of providing advanced telecom services shall remain ineffective in this world telecom day.

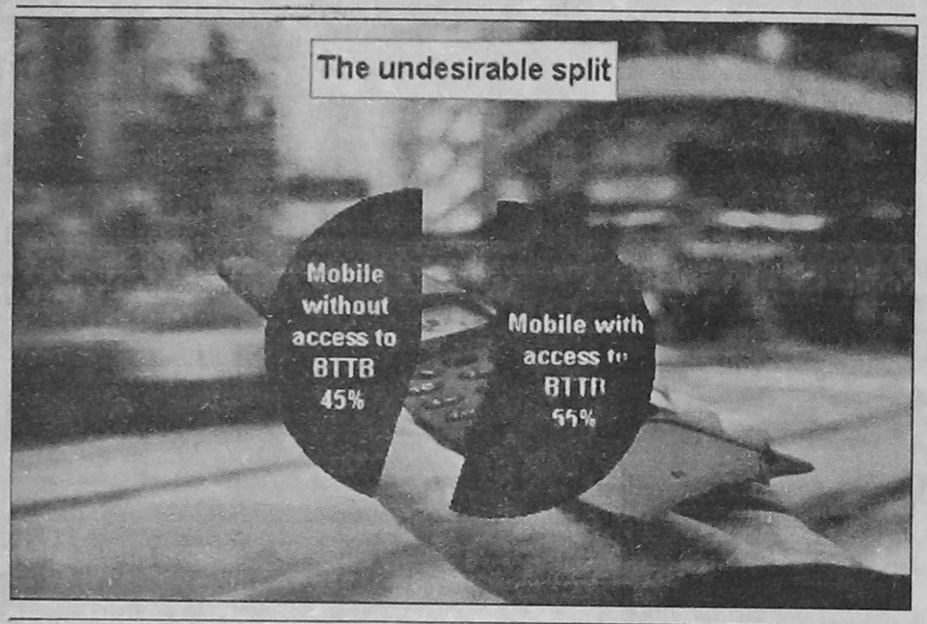
Table 1

Current state of the Mobile market

Operator	Brand	Mode	With BTTB	Without BTTB	Total
PBTL	CityCell	AMPS	18,000	0	18,000
PBTL	CityCell Digital	CDMA	12,800	5,200	18,000
Grameen Phone	GrameenPhone	GSM	29,000	*65,000	94,000
TMIB	AKTEL	GSM	25,900	1,700	27,600
Sheba	Sheba World	GSM	7,000	5,000	12,000
			92,700	76,900	169,600

Source: Respective operator

*Including 25,300 prepaid



Technology Review: The Mighty Number Seven

by Taufik Mahmood

EARLY telephone networks were the result of years of evolution, with little thought about future technology. Based on analog equipment, the telephone network of the early telephone companies was not well suited for services such as data and video. Many individual technology service providers began popping up during the 1960s, providing packet-switching network and data communications services the telephone companies were just not equipped to provide.

The international telephone network was facing the same problems. In many countries, just getting telephone service was a feat in itself. As international bodies began investigating alternative technologies for providing telephone service to the masses (such as cellular mobile), the need for an all-digital network became apparent. Thus arose the beginning of an all-digital network with the intelligence.

The International Telecommunications Union (ITU) commissioned a body named CCITT to study the possibility of an all-digital intelligent network. The result was a series of standards known now as Signaling System #7 (SS7). These standards have paved the way for the Intelligent Network (IN) and, with it, a variety of services, many yet to be unveiled.

The CCITT developed a digital signaling standard in the mid-60s called Signaling System #6 that would revolutionise the telephone industry. Based on a proprietary, high-speed data communications network, SS6 later evolved into SS7, which has now become the signaling standard for the entire world.

The secret to its success lies in the message structure of the protocol and the network topology. The protocol uses messages, much like X.25 and other message-based protocols, to request services from other entities. These messages travel from one network entity to another, independent of the actual voice and data they pertain to, in an envelope called a packet.

Common Channel Signaling (CCS) was first introduced in the United States in the 1960s as Common Channel Interoffice Signaling System #6 (SS6). Developed by the ITU, SS6 used a separate facility for sending signaling information to distant telephone offices.

The first deployment of SS6 in the United States used 2.4 kbps data links. These were later upgraded to 4.8 kbps. Messages were sent in the form of data packets and were used to request connections on voice trunks between two central offices. This became the first use of packet switching in the Public Switched Telephone Network (PSTN). The packets were assembled by placing 12 signaling units of 28 bits each into a data block. This is similar to the method used in SS7 today.

Signaling System #7 (SS7) was derived from the earlier SS6, which explains the similarities. SS7 provides much more capability than SS6. Where SS6 used fixed-length signal units, SS7 uses variable-length signaling units (with a maximum sized length), providing more versatility and flexibility. SS7 also uses high-speed data links (56 kbps). This makes the signaling network much faster than SS6. In international networks, the data links operate at 64 kbps. Study is under way to increase this in the United States to 1.544 Mbps, and internationally to 2.046 Mbps.

As of 1983, SS6 was still being deployed throughout the United States telephone network, even though SS7 was being introduced. As SS7 began deployment in the mid-1980s, SS6 was fazed off the network. SS7 was used in the interoffice network and was not immediately deployed in the local exchanges until many years later.

In fact, the first usage of SS7 was not for call setup and teardown, but for accessing remote databases. In the 1980s, the telephone companies offered a new service called Wide Area Telephone Service (WATS) like toll-free number, or nationwide common emergency number. It used a common area code like 800 for toll free and 911 for emergency in the USA. It became a problem for telephone exchanges, which uses the area code to determine how to route a call through the telephone network.

To overcome this problem, a second number was assigned to every 800 number. This second number was used by the exchange equipment to actually route the call through the voice network. But the number had to be placed in a centralized database where all central offices could access it. This database became a popular commodity for all telephone companies and still exists today.

When an 800 or 911 number is dialed, the telephone company switching equipment uses a data communications link to access this remote database and look up the actual routing number. The access is in the form of a message packet, which queries the network for the number. The database then responds with a response message packet, providing the routing telephone number as well as billing information for the 800 number. The switching equipment can then route the call using conventional signaling methods.

SS7 provides that data communications link between switching equipment and telephone company databases. Shortly after the 800 number implementation, the SS7 network was expanded to provide other services, including call setup and teardown. Still, the database access capability has proven to the be the biggest advantage behind SS7 and is widely used today to provide routing and billing information for all telephone services including 800 numbers, 900 numbers, 911 services, custom calling features, caller identification, and many new services yet to be offered.

The 800 numbers at one time belonged to one service provider. If subscribers wanted to change service providers, they had to surrender their 800 number. This was due to the location of the routing information. All routing information for 800 numbers is located in a central database and accessed via the SS7 network. SS7 is now used to allow 800 numbers to become transportable and to provide subscribers the option of keeping their 800 numbers even when they change service providers.

Without SS7, number portability would be impossible. Local Number Portability (LNP) is a service mandated in the USA by the government in 1996. It requires telephone companies to providing telephone number permanently to the customers. If customers wish to change their service from one operator to another, they would normally be forced to change telephone numbers. This is because of the way telephone numbers are assigned in switching equipment, with switches assigned ranges of numbers.

With LNP, the telephone number does not change. This requires the use of a database to determine which exchange in the network is assigned the number, very similar to the way 800 numbers are routed. Lately, the LNP also supports subscribers moving from one location to another without changing their telephone number (even if they move to a new area code). This obsoletes the former numbering plan and the way calls are routed through the

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