TDRI Quarterly Review

Published in *TDRI Quarterly Review*
Vol. 13 No. 4 December 1998, pp. 3-10
Editor: Tony Allison and Ryratana Suwanraks

Telecommunications: Future Growth Opportunities – Promising Areas of Expansion in Thailand*

Sumeth Vongpanitlerd**

Under normal circumstances, the task of predicting what lies ahead in telecommunications has never been an easy one. N-ISDN is one good example. At this time when the pace of technology and market development worldwide has never been so furious, allied with the current economic uncertainty, the task is made doubly difficult.

This paper shall attempt to present an analysis of likely growth opportunities in a number of major telecom services, namely fixed telephone lines, cellular phones, long distance and international traffic, cable television, as well as data communications, especially the internet. In order to lay the groundwork for the above analysis, a brief account of some important trends and implications in terms of recent technology advances and developments in the Thai market will be given first.

SETTING THE SCENE

In the foreseeable future, technology and deregulation will continue to drive the development of the telecommunications market worldwide. Thailand is no exception.

The Technology Factor

On the technological front, the twin pillars of changes—*digitization* and *miniaturization*—continue to provide the main driving force for rapid advancement in telecommunications and the computer industry.

Characteristics of the *miniaturization trend* are an *increase in capacity*, *shrinkage in size*, *reduction in costs*, and *enhancement in capability and performance*. This trend is most visible in the field of *microelectronics* in the form of *microchip* or *integrated circuits* (IC) that replace hundreds of millions of individual electronic components. The trend can also be seen in the development of *optical fibers,* which will become the *broadband transmission highway* (information super-highway) of the future, replacing metal-cable networks, or even threatening the satellite technology of today.

While the *shift from analog to digital technology* (or digitization) of telecommunications systems—ranging from customer premise equipment (CPE) to transmission and switching—not only exploits the profound individual benefits offered by the advances in microelectronics and optical fibers technology, above all it allows the integration of computer systems into telecommunications networks with consequences never before dreamed of.

Indeed, through digitization and the injection of intelligence into telecommunications networks and CPE, the networks have been transformed beyond recognition, with rapid and substantial improvement in the capability, functionality, quality, efficiency, and variety of telecommunications and information services. This results in increasingly lower prices, better quality and services to customers, higher and higher demand and usage. Since the beginning of the 1990s, this has caused unmatched overall growth of the world's information sector at about twice the world GDP growth rate.

The Regulatory and Business Paradigm Shift

These shifts have come about not only through rapid advances in technology, but also because the cost of implementing a given function in hardware (equipment) has fallen. Simultaneously, the sophistication and capability available for a given unit cost has increased greatly, culminating in many well known trends, with more in the pipeline. These include:

- The tearing down of barriers, physical and non-physical,
- The breaking down of the natural monopoly argument,
- The "Death of Distance," and soon, the "Death of the Minute,"
- The demand of consumers, particularly large global as well as local business users, for deregulation and competition,
- The privatization of traditional state-owned Public Telecom Operators (PTOs),
- The blurring of services and markets,
- The emergence of the internet and e-commerce,
- The rapid rise and growth in data over voice, and finally,
- The convergence of technology and markets into one single network of networks in the 21st century.

On the other hand, driven by fast-paced technology development, deregulation will undoubtedly open up vast growth potential and opportunities for both incumbent and new entrants. At the same time, changes create an about-turn from a natural monopoly to a new business paradigm in which:

- There is an increasing separation of embedded intelligence from the switch and decentralizing of network and operation intelligence,
- There will be market fragmentation into network (infrastructure) wholesale and retail segments, rather than on the traditional basis of products or services segmentation,
- Customer needs rather than network capabilities will drive applications and services,
- New niches will open for large, medium and even small-sized operators and service providers,
- Networks, better able to handle data traffic, not voice, will be the key to exploiting business growth,
- There will be greater technology risks for network operators.

The paradigm shift therefore poses as many threats as it presents growth opportunities to PTOs, making market reform and the necessary transformation of existing PTOs in many countries, including Thailand, a very difficult task. *And obviously, any attempt to predict the future of a sector such as this one, is a very risky proposition*.

The problem is bound to be compounded by the uncertainties triggered by the "Tomyam Kung Disease" (economic crisis) beginning in July 1997, which quickly spread to many other emerging economies around the world, and which has no end in sight.

THE BIG PICTURE IN THAILAND

Market Structure

Legally, the telecom market in Thailand remains a monopoly in which there is segmentation in basic telephony between two state-owned enterprises (SOEs). The Telephone Organization of Thailand (TOT) is the sole operator for the domestic market (including neighboring countries with common borders), while the Communications Authority of Thailand (CAT) has the right to all international services, including internet. Both, however, have the right to provide many value-added services (so-called related business segments), such as paging, cellular, and very small aperture terminals (VSATs). The right to satellite orbits and service remains with the Ministry of Transport and Communications (MOTC), which also oversees frequency management and allocation through the Post and Telegraph Department (PTD).

Saddled with inadequate human and financial resources, in the mid 1980s, the monopolies could not provide adequate basic fixed-line services, with waiting lists of up to eight years on average to have a phone line installed. The Government consequently saw fit to relax its tight control and private sector participation was allowed in the late 1980s through a build-transfer-operate (BTO) scheme of privatization in an effort to circumvent the lengthy and complicated process of revising a number of related laws.

Role of the Private Sector

The BTO move opened a floodgate of private sector investments, resulting in a dramatic expansion in telecom infrastructure and services never before seen. Some 30 concessions were given, mostly by the TOT and the CAT, as

well as the PTD and MOTC, to a number of local large companies. Many formed joint ventures with foreign telecom companies, such as NTT, Nynex and Singapore Telecom.

This important change of policy largely removed the pressure to meet the country's needs for fixed and mobile telephones as it underwent a considerable industrial structural change from an agricultural-based economy toward a manufacturing and service-based economy in the mid 1980s. Rightly or wrongly, the country was able to achieve double-digit GDP growth rates over three consecutive years at the turn of the decade, and registered an average of about 8 percent growth up to 1996.

Under the TOT's concessions to TelecomAsia Co., Ltd. (TA) and Thai Telephone and Telecommunication Co., Ltd. (TT&T) to install 3 million phone lines beginning in 1993—later increased to 4.1 million lines—the number of lines almost tripled in six years. From about 2.5 million lines or a teledensity of 4.3 per 100 population in 1993, the figure jumped to 7.1 million lines, representing the current teledensity of 11.6 per 100 population.

The rise in the supply of cellular phones is even more dramatic. With the service introduction in 1986 by the TOT and in 1987 by the CAT, there were a mere 100,000 subscribers by 1989. But with the entry of Advanced Info Service Co., Ltd. (AIS) in 1990, and Total Access Communications Co., Ltd. in 1991, the number of cellular phone subscribers has shot up to some 2.2 millions at present, a 20-fold rise in under a decade, representing a penetration rate of about 3.67 per 100 population.

Table 1 lists major services and infrastructure providers through BTO arrangement by the private sector in Thailand, while Table 2 provides some important country and market indicators.

Sector Reform in the Making

The Thai Government has set in motion a master plan and timetables to reform the Thai telecom sector. There is no denying that the main driving force is the commitment made to the World Trade Organization (WTO) to open the Thai market fully by the year 2006—a move triggered by and a consequence of the globalization phenomenon sweeping the world.

The current Telecom Master Plan envisages the following important changes and goals:

- By 1 October 1999, the Thai telecom market is to be open to local competition. Licenses will be issued to the TOT, the CAT and a number of new carriers with majority Thai shareholders.
- An independent and self-financing regulatory authority will be responsible for the administration of the New Telecommunication Act, licensing, codes of practice, interconnection issues, and consumer interest protection, etc.
- The conversion of concession agreements into equity, debt or an asset transfer is to be completed by 31 March 1999.
- The corporatization is set for no later than January 1999 and the privatization of the TOT and the CAT through a process of placement to (most likely foreign) strategic partners with up to 25 percent share-holding by April 1999, a private placement by October 1999, and floating of shares in the local and foreign stock markets at a later suitable date. Eventually, the government will become a minority shareholder in the privatized TOT and CAT.
- Finally, the full liberalization of the telecom market where all qualifiers, local and foreign, are allowed to enter and exit the market at will on an equal basis, will commence on 1 January 2006.

It is expected that *competition at all levels,* from *network*, *resale*, to *retail,* if properly promoted and efficiently regulated, will surely benefit consumers of telecommunication services where there will be *greater variety* of product offerings, *choice* of providers, *better product* and *service quality*, and *lower prices*.

All of this, if realized as planned, will expand the market in ways never before possible. Simply put, there will be no shortage of *growth opportunities in all areas for current and future network and service operators*.

IS THERE LIFE AFTER THE EXPLOSIVE FIXED-LINES GROWTH?

Even before the currency crisis finally surfaced in mid-1997, and which triggered the economic downturn across much of Asia, trouble signs were evident in the financial states of both TT&T and TA. The crisis just made matters worse.

With half TA's lines (about 1.3 million) unsold in the Bangkok Metropolitan Area, and about one-third of the 1.5 million lines TT&T has built in major town centers across the country waiting to be connected, it is only natural to ask if Thailand is facing a surplus in fixed-line telephones.

Certainly, it would take at least several years to connect the above-mentioned excess capacity of 2 million lines. But that does not mean there is an overall excess of fixed-line supply over demand for the entire country. Far from it, there is currently an unmet demand for fixed lines of 726,000 lines, of which more than 681,000 lines are from residents in provincial areas, according to the current waiting list (Table 3). The TOT is busy fulfilling this demand through its 800,000 million line infrastructure building program.

It is obvious that Thailand has the rare distinction of having a substantial excess and a considerable shortage of fixed-line supply simultaneously, all because of wrong business decisions made by private investors, and the failure of policy and regulatory controls on the part of the policy makers and SOEs concerned.

While the waiting list of Table 3 shows only an unmet demand of 44,000 lines in Bangkok, and 682,000 lines for the rest of the country, the actual unmet demand is anybody's guess, but certainly it is much more. The reason is clear. The existing telephone network (except rural public phones) has yet to cover two-thirds of the country in area, and some 60 percent or more of the population is still without telephone services. The waiting list represents largely the demand for service within the area covered by the existing network.

According to the forecasts by the TOT (1998) and the Thailand Development Research Institute—TDRI (1997 prior to the economic meltdown) in Table 4, it is likely that the country will need to install between 5 to 7.5 million additional lines over the next eight years, the majority of which should come from the presently unserved provincial areas.

There are a number of reasons that lead to the belief that there are plenty of growth opportunities presented by much more additional fixed-line demand throughout Thailand.

The demand forecasts in Table 4 make use of traditional modeling techniques based on historical growth patterns linked to the economic and demographic data of a particular country. But in the face of likely immense changes following future market reforms, regulatory changes, and the great leap forward in technology advances in recent times, coupled with the unavoidable business paradigm change, there will certainly be great potential for additional telephone lines for both the incumbents and new entrants to exploit. Not least of which is the second-line market, in addition to the many first-time phone users, those seeking to access the internet, to surfing the World Wide Web, and to be part of the global e-commerce, a subject to be touched upon subsequently.

TALK WILL BE CHEAP AND PLENTIFUL

With the market liberalization toward the end of 1999, it can be expected that telephone calls, especially domestic long-distance and overseas calls, will become much cheaper and far more affordable in line with plunging cost trends around the world.

Currently, domestic long-distance call rates range from three to 18 baht a minute (day-rate), while international calls range from 30 baht a minute (to HK, Singapore), 37 baht a minute (to North America), to 42 baht a minute (to the UK, for example).

The telecom cost structure has undergone dramatic reductions in recent years. These cost reductions tend to be passed on to end users in countries where there is effective competition in the market. For example, while British Telecom's (BT) quality of service improved considerably between 1986-1993, there was an overall price reduction in real term of over 30 percent. Similarly, in Japan, domestic long-distance calls were reduced by 55 percent and international calls by 61 percent during 1985-1994. New Zealand experienced a reduction of 46 percent in long-distance calls during 1986-1993, and the US a reduction of 40 percent during 1984-1989.

In 1996, AT&T announced a residential rate of 15 cents per minute irrespective of distance (flat-rate) within mainland USA. Earlier in 1998, Qwest set a rate of 6.5 cents a minute flat-rate charge. Other long-distance providers in the US are set to follow with even lower prices in the near future. Such is the awesome power of progress in technology and competition. With falling prices and shrinking profit margins, usage and market sizes, however, shoot up

exponentially.

In Thailand, the use of domestic long-distance calls grew strongly in the first half of the 1990s, ranging from 20 percent to 35 percent despite comparatively high charging rates. The growth slowed down markedly in 1996 to 7.7 percent, and even suffered a negative growth of 1.4 percent in 1997 (Table 5), caused mainly by the economic crisis beginning in July of that year. However, there were other factors at play. It is undeniable that many calls were taken from fixed-line networks by cellular networks as the prices of handsets dropped. On top of that, in order to sign up new subscribers, cellular operators offered attractive calling plans with free minutes and/or hefty price reductions in a market where there already existed a distorted pricing structure in which long-distance rates charged by cellular phones are cheaper than fixed-line calls.

Thus, if one takes into account both fixed and mobile networks, the total growth in the numbers and minutes of long-distance calls should be much stronger, especially after the market opening expected in 1999, which promises to bring down fixed-call prices substantially in line with costs.

Likewise, outgoing international calls also show a strong though declining growth trend, due perhaps to competition from callbacks (which are bound to channel an unknown amount of calls from the CAT). For example, between 1990 and 1995, the number of outgoing calls grew with a compound annual growth rate (CAGR) of 21.3 percent from 25.5 to 66.94 million calls (Table 6), while the minutes of calls increased 18.34 percent from 95.6 to 221.9 million minutes, according to the International Telecommunication Union (ITU). Future competition will definitely bring prices down and usage up, including reducing the revenue lost to overseas callback operators.

THE WIRELESS PHONE MARKET KEEPS MARCHING ON

If past experiences of the more matured wireless communications in other countries are any indication, it is almost certain that there will be even stronger growth in the combined cellular and personal communications service (PCS) market well into the next decade.

At the end of 1996, there were about 35 million wireless users in Europe, representing a 53 percent increase over 1995. Total penetration across Europe saw a 50 percent growth from 6 percent in 1995 to 9 percent in 1996, the highest penetration being among Scandinavians (between 25% to 30%), the UK and Italy (around 11.5%), the lowest being France (4.3%).

In the US at the end of 1996, there were some 45 million subscribers, up from about 36 million at the end of 1995, representing a 30 percent growth, and a penetration rate of about 16.5 percent in 1996. According to Goldman Sachs, penetration will reach 27 percent by 2000, and 33 percent by 2005 at a CAGR of over 14 percent.

Indeed, growth in subscribers worldwide in the 1990s has been remarkable, increasing from 11 million to more than 120 million between January 1991 and September 1996 (Table 7). It is believed that further significant growth potential in the worldwide wireless phone market will push total subscribers to some 312 million by 2000. Most of the growth will come from countries with very low penetration. Thailand is expected to be one of these.

Between 1991 and 1997, the Thai cellular market grew from 0.14 million to about 2.2 million at a CAGR of 58.3 percent. It stands above the global growth between 1990–1996 at 49.9 percent, but below Asia Pacific's 67.9 percent. Cellular penetration in Thailand rose from 0.3 per 100 population to 3.66 at the end of 1997.

Assuming a conservative goal of reaching a penetration of 10 per 100 population by 2014, at a level for Singapore, New Zealand, or the UK in 1995, the forecast given in Table 8 shows that cellular subscribers in Thailand should grow from about 2.5 million in 1998 to about 6 million in 2008, representing a CAGR of just over 9 percent or a net gain in subscribers of some 350,000 a year.

However, an even higher growth should not be ruled out in the face of pending market liberalization and further introduction of new PCS services in the near future. For example, before the current crisis in Asia, ITU projected a CAGR of nearly 30 percent for Thailand between 1996 and 2000 when the total cellular market is expected to reach the 5 million mark.

CABLE TV AND DBS: AN UNCERTAIN FUTURE AHEAD

This is one area of the Thai telecom market where the prospect for growth is very much in doubt. The outcome will

hinge ultimately on the quality and cost of programming, and of course, on prices of services.

Currently, the estimated total number of cable TV and direct broadcast satellite (DBS) subscribers lies between 300,000 to 350,000. Nearly all the market share belongs to the United Broadcasting Corporation PCL. (UBC), a recent merger of UTV, a cable operator covering Bangkok, and the International Broadcasting Corporation PCL. (IBC), a nationwide provider based on wireless multichannel multipoint distribution system (MMDS) and DBS technology.

The major barrier to market growth is the limitation of programming to suit local consumers. To begin with, only a meager number of Thais can read English, an even smaller number can understand spoken English.

In addition, distinctly different needs and cultural differences exist between the West and Thais in terms of entertainment, news, and educational programs. The costs of producing Thai programs tailored for local consumption would be prohibitively high based on current penetration of 0.5 per 100 population, compared with over 23 televisions per 100 in 1997.

In addition, growth prospects are not good, at least for some time, in view of the economic situation and the near market monopoly condition of today.

BRIGHT PROSPECTS FOR INTERNET AND E-COMMERCE WAITING FOR TAKE-OFF

Imagine that only less than 3 years ago, there were 3 million internet users worldwide. Today, the total has soared past 120 million, a 40-fold increase with no sign of a slow down. By 2000, it could surpass the one billion mark.

ITU has predicted that annual global telecom services will exceed the US$1 trillion mark by 2001, from about US$726 billion in 1997, or nearly twice the 1994 total of US$513 billion. The rapid rise in revenue came amid drastic falls in service charges brought about by technology changes and competition in more and more countries. It can only mean that traffic (or usage) must have increased even more rapidly. The shining star is of course, the rise in "data" traffic over "voice."

Many people have predicted world data traffic will exceed voice traffic soon. In the US, it is projected that US firms will spend some $150 billion in 2001 in telecom services (from $90 billion in 1997) of which 80 percent will be data traffic. And the driving force behind this is the need for businesses to slash their time to market in order to stay competitive.

Businesses around the world are beginning to see the need to wire themselves up electronically into one digital supply chain using the internet and intranet to link their customers, factories, warehouses, supplies vendors, and so on. In the present globalization context, *fast response time is now more important than low labor costs*. Many big account customers are not just demanding "just-in-time delivery," but "inventory-handling" as well.

In short, firms around the globe must embrace e-commerce or risk going out of business.

For now, major use of e-commerce (hence major creators of data traffic) comes nearly exclusively from business to business or corporate transactions. But with anywhere, anytime communication that enables buyers to easily and quickly search for and compare products and prices, data traffic is bound to explode sooner or later.

Therefore the use of e-commerce will spread from corporate to consumers worldwide. For now, buying and selling over the internet is only beginning to be felt in:

- Personal finances, like banking, insurance, stock trading,
- Travelling, like ticketing, seat reservation, hotel booking,
- Shopping for products and services, like cars, books, music CDs, computer hardware and software, flowers, pizza etc.,
- Online auctions and exchanges for such things as energy supplies (gas and electricity), long-distance phone minutes, etc., in addition to a vast range of traditional items sold by auction houses.

Once Asia, including Thailand, is well on the road to recovery, there will surely be huge opportunities for networking

equipment, software, consulting services, and of course, data communication services.

To meet future business and consumer needs in fast emerging e-commerce activities, not only will there be huge demand to access the internet and the World Wide Web, a lot of business opportunities will be created for telecom operators (both network and service providers) in the form of:

- Increase in traffic (usage) revenues,
- Second telephone lines for consumers,
- Additional lines for (800) free-phone services for business,
- Leased line for corporate intranet.

This can only be good news for all future telecom investors and service operators anywhere, Thailand included. Thus, there are many good reasons on account of future competition and the take off in data traffic growth to conclude that the expected growth in the fixed and mobile telephone demand forecast given earlier could well be far too conservative after all.