Telecommunications Convergence, Competitiveness and Development of Broadband Internetworking Technologies Services: Impacts, Challenges and Proposals for Mexican Market Evolution

Gerardo Chavez

IEEE Mexico Council, Past-Chairman

ABSTRACT

The objective of this work is to provide the necessary elements to back up the fact that Mexico has not increased its levels of competitiveness and it neither has equaled to other countries in the region. Therefore, it is required to implement comprehensive reforms in sectors such as education, infrastructure, healthcare, information technologies and telecommunications, among others. Some of the difficulties that prevent Mexico to improve its competitiveness levels, are the lack of incentives that drive for an increase in the school-study grades of the population, asymmetry in the coverage and service offering in telecommunications that have concentrated their commercial activity mainly on the main capital cities, lack of transparency and the need to accelerate evolution of the judicial system. In order to attain a coherent strategy and promote reforms in the sector, we will analyze different and yet related aspects such as the adjustments needed in regulations, the availability of Broadband Internetworking Technologies (BBINT), expansion of the Telecommunications Industry (TI) infrastructure, mobile mainly, the promotion mechanisms for innovation and the existence of good conditions for research and development on this BBINT arena, to mention only a few of them.

I. BROADBAND INTERNETWORKING TECHNOLOGIES (BBINT) SERVICES OVERVIEW

a) BBINT status worldwide

Looking around the world for future telecom services, one of the bright spots is Broadband Wireless Data. There are many solutions that fit into this category, including:

- Wireless -- mobile operators;
- Public Hot Spots;
- Enterprise WLAN;
- Broadband wireless -- other operators.

For the purposes of this discussion, broadband is defined at 1.5 Mbps and up.

Broadband Wireless – Mobile Operator

The ultimate goal is obviously to have broadband speeds available through the mobile infrastructure from any location desired. Although mobile operators are heading in this direction, they are still taking baby steps. Flash OFDM (orthogonal frequency division multiplexing) and 1x-EVDO (evolution for data only) seem to be making the most headway in U.S. market deployments to date.

Public Hot Spots

Wi-Fi hot spots seem to be everywhere and even wireline telcos and equipment vendors now have a Wi-Fi play. The good news is the service will be easier to find and access and allow for users to taste broadband speeds over wireless. The bad news is there's so much hype and new vendor products flooding this market that many are destined to fail. Wi-Fi is an important technology that should be a part of the broadband wireless solution; therefore Wi-Fi is the stepping stone the industry and end users need.

Enterprise WLAN

Probably the most aggressive deployment of broadband wireless solutions to date is in the enterprise. WLANs allow for LAN-speed connectivity within buildings and campuses without any wires. On the flipside of the equation is security.

Broadband Wireless

There are three main categories for today's new generation of services: premises-based, portable and mobile. These services tend to be deployed by wireline telcos or wireless ISPs (WISPs) [1].

1-4244-1521-7/07/$25.00 ©2007 IEEE

II. COMPETITIVENESS AND CURRENT STATUS OF TI AND BBINT IN MEXICO

a) Competitiveness in Mexico

Competitiveness indicates how a country, a company or an individual's ability responds to open competition among several similar market participants and it is associated to the level of competence and efficiency shown in those markets.

The international consensus, based on empiric experience, considers critical issues that encourage competitiveness and development in a given country:

- Institutions
- Infrastructure
- Macro economy
- Healthcare
- Education
- Market Efficiency
- Technology

A country needs the development of all the factors as a whole. The progress of only one of them does not generate the same benefits as the progress of all.

Above all, we need to consider the consequences of this being left behind over productive investment attraction. On the list of countries receiving Direct Foreign Investment (DFI), published by the OECD, Mexico has fallen from position 3 to 22 in only one year. According to the Global Competitiveness Ranking, Mexico has been constantly losing competitiveness since 2003, going down from position 47 in 2003 to position 58 in 2006, as it was recently published by the WEF. What is more, Mexico is not only decreasing competitiveness compared to ourselves, but we can also see that other countries in the region, with similar economic and social conditions have obtained better grades than us regarding competitiveness.

b) TI status

Mexico, at the end of the 80s, driven by globalization market trends, decided to privatize and deregulate Telecommunications Industry. To start with, the government sold Telmex, the Mexican PTT, by December of 1990.

In order to fast-track deregulation process, Mexican government created a Federal Telecommunications Commission (Cofetel), with a full autonomy from Telecommunications Ministry in August of 1996.

On the other hand, paid TV has still market coverage about 13.7% and since October 2006, cable operators are able to offer new multi-play value-added services like telephony over IP, besides current Internet access, home-banking services and establish metropolitan local telephone networks, to compete mainly against traditional local telecom service providers. In fact, this new business market opportunity for cable operators is now creating a next-generation of products and services oriented to match these broadband technology capabilities for voice, video and data that they have on hand. In Mexico, there are more than 150 cable operators spread all over the country that cover around 304 cities, and they are now planning an investment for about US$ 1 Billion to modernize their current infrastructure and to increase their coverage up to 387 cities [3].

Between the major players on the Mexican market we currently have and their current evolving role are: Telmex, in association with the new AT&T, has now recently expanded to Latin America thru the acquisition of former AT&T Latam assets in the region and a controlling stake in Brazil's Embratel, and also the Cellular-arm of Grupo Carso, Telcel/America Movil, with also a main presence across all Latin America and the Caribbean; Telefonica group, focused here only on wireless operations via its mobile unit MoviStar; Alestra, jointly formed also by the new AT&T, BBVA- Bancomer (second largest Mexican bank) and Steel-manufacturer Alfa; Avantel, a joint venture of MCI and Citi-Banamex (First Largest bank), now recently acquired by Axtel CLEC, a joint venture of Cement company Cemex, and Bell Canada International; Iusacell, now divested from Verizon and owned by Grupo Salinas holdings, and under a merger process with previously owned cellular company Unefon; Protel, and finally Marcatel, a joint venture of IXC Communications, Westel and Siemens[2].

Mexico is a unique telecoms market in Latin America: it combines fast growth in telecoms services and an stable macroeconomic environment. The latter has resulted in a resilient currency, which translates into sustained service

revenue growth measured in dollar terms. Combined revenues of fixed voice, datacoms, mobile, Internet, and pay-TV services originated in Mexico will grow from US$18.7bn in 2002 to US$28.1bn in 2007, representing a compound annual growth rate of 8.5%. Despite the anticipated growth, competing carriers will have difficulty staying afloat. Incumbents Telmex and Telcel will be the anchors of Telecom market growth in the next five years [3].

c) BBINT status

The development of BBINT and their incidence in productivity are not only dependent of the companies and industries devoted to producing and distributing the related goods and services. On the contrary, the telecommunications sector, or rather the advantage that we take from that sector for productive purposes are closely linked to aspects such as legal and regulatory, availability of infrastructure, ability to adopt new technologies, aptitude for innovation, behavior of the financial system and economic conditions, among others.

Similarly, investment in infrastructure is a necessary condition for the advance of the telecommunication sector. The degree of infrastructure is at the same time cause and consequence of the country's development. Economic growth rises by 0.1% with every percent point that telecommunications infrastructure increases. This means that 10% of the increases in our total GDP can be explained by the services derived from communication infrastructure. It can be said that in a semi developed economy as the Mexican, the dominant effect is a growth of the infrastructure, thus generating a supply driven demand for it. According to the National Institute of Geography and Informatics (INEGI), only 8.9% of the micro economic units and 95.1% of the big ones, use computers for administrative tasks. Even worse is that the percentage of micro companies that use the Internet to relate with their clients and providers is 5.8% versus 84.5% of the big ones. This underlines the productivity backwardness we have in comparison to other countries due to the modest use of BBINT.

In regards to personal access to telecommunications services, we find that the number of people with any type of access to telecom services is very low. Only 79% has a telephone line, either fixed or mobile, in opposition to countries like England or Switzerland where saturation reaches 100%. Analyzing the income, the percentage of the GDP that Mexico gets from telecommunications has increased from 1.53% in 1990 to 2.64% in 2003, while the average in OECD countries is around 3.19%, according to that organization.

In addition to this, the World Economic Forum placed Mexico in position 55 among 114 countries classified by their Index of Potential for Connectivity during 2005-2006. This index measures how likely are the countries to use the opportunities offered by information and communication technologies, and in it Mexico occupied position 47 during 2001-2002, 44 during 2003-2004 and position 60 during 2004-2005[5].

Direct foreign investment in the sector is restricted due to conflicts in the regulation. For companies in the business of mobile services and Internet, for example, there is no limit regarding participation of foreign capital, while for fixed telephone services, there is a maximum limit of 49% participation of not Mexican capital, and a resulting negative impact in terms of restraining an effective competition and provoking slowness in the development of the country. This phenomenon is not limited to the field of telecommunication, but considering the important part that contents would play in a convergent system, we should not make it difficult to those companies interested in Mexico to make investments in radio or TV broadcasting.

d) BBINT opportunities

Areas of opportunity remain for carriers in Mexico to exploit and induce even greater growth of telecom service revenues. For instance, fixed broadband adoption and mobile data have yet to take off in a massive way [1]. Revenues from mobile services have also been growing at a steady pace and are fast approaching the size of the fixed local services market. Then it is estimated that at YE2006, revenues from mobile services will be roughly 85% of fixed local service revenues [4].

Broadband Internet access has been slow to take off in Mexico even when compared to countries with lower or similar Internet account penetration; recently Telmex launched a major campaign to introduce its High-speed Broadband

Prodigy Infinitum solution nation-wide with an aggressive estimate of more than 1,000,000 subscribers' penetration by end of 2006. In Latin America, there are also a number of markets where broadband access is rapidly taking off mainly for Internet access purposes although Chile is already testing IPTV applications. In Chile, Brazil, and Venezuela, the uptake of DSL accounts is the main catalyst of broadband adoption. Telefónica, the Spanish operator, has been among the most successful operators in marketing DSL across the Americas, mirroring some of the strategies used in Spain [4].

III. IMPACTS AND CHALLENGES OF TI AND BBINT IN MEXICO

Mexico faces an important challenge which is to modify its political agenda to include the TI and BBINT as a priority, trans-presidential project which should be tailored to the new context of the sector: Convergence. Convergence refers to the integration of all images, video, data, voice and other components that could be transported trough the same networks, so the users can have access to them from a variety of terminal sites. This phenomenon is today taking place in telecommunications, radio, television, communications, and software and equipment manufacturing as well.

The regulatory evolution must also consider the competitive benefits that regional integration has in face of an intense international competition. Other important measure to improve the efficiency of the sector is a clear definition on which will be the frequency bands that will require a license of use and which ones will be of free access so that all agents can profit from the current and the upcoming technologies such as Power Line Communications (PLC), WiMax and 3G, among others.

a) Regulation Evolution and Convergence

The trend of all agents in the telecommunications sector is to offer and demand convergent services, this is, the unification of several services in one single network, for example, to offer voice, data and video services by means of the paid TV companies. This represents benefits both for the providers in the form of scale economies, cost reduction, etc, as for the consumers in the form of fare reduction, payment simplification, less paperwork etc.

Convergence not just considers the service providers and consumers, but it also includes companies that develop and manufacture the devices without which this convergence would not be possible. A third and fundamental element for convergence is the regulation.

b) Regulation Impacts

- Control over contents and price. - Parallel to a change towards convergence is an increase in the value added and content-related services. It is not clear whether the administration, price and content, beyond legal restrictions over content such as porno or virus regulations are appropriate for authority actions. Uniformity in the offer of contents is among the parameters to be established in the market. This means for example that the operators of paid television must have access to the same loop of channels, which would allow them to compete in equal conditions. In Mexico, where almost all local TV contents are in the hands of a couple of participants, this measure takes great importance as it counts on content developers to adopt anti-competitive measures that result in disadvantages for consumers.

- Market equity for services. - Apart from regulator's content control is provider's content control. Many of the new services that clients demand every year are provided by independent content and service operators. If the operators restrict and control access to content, consumers will have limited options and new service providers will be left out of the bigger segments of the potential market. This is part of the network neutrality issue.

- Interconnection. - Interconnection with convergent networks could use gateways so that the traffic supports legacy competitive networks.

c) Economic Impacts

- Pricing. - While in many cases, convergent networks require new capital investments, they typically result

in lower cost networks for the operators. These economical impacts must be part of the "basic service" price. Additionally, the definition of basic service must be reconsidered in the light of Internet and the offering of new services. It is important to underline that due to the limited purchase power of most of Mexico's population; the highest economic layers of society and also the small and medium sized companies will be at the beginning, the first to get benefits from the lower prices of the convergent offering (bundling of different services in the same invoice). For this reason it is advisable to introduce laws that allow the least favored sectors of the population to access convergent services.

- The choice of providers and the elimination of traffic controllers (gatekeepers).- As the networks go beyond person to person communication and turn to person to machine and machine to machine, a reasonable level of foreign source content must be considered as well as the traffic control or function of traffic control of the service provider.

d) Social Impacts

- Creation of value. - Creation of contents and new services has been the result of combining network convergence and open standards. Broadcasting models are based on a concept of limited channel space, high production costs, and few options for navigation or content search. These factors are less relevant today and should not structure the base of the content control concept in a convergent network.

- Censorship. - Censorship is a social/government, non commercial determination. Although there could be limitations about the content that a user can access to due to legal restrictions, the provider should not be allowed to make one sided restrictions nor limit the access to some little commercial contents in a discriminatory way.

IV. PROPOSALS FOR TI AND BBINT CONVERGENCE AND EVOLUTION

BBINT Convergence is a dynamic and continuous process and its effects will go beyond the media and technology corporations, causing profound changes in competitiveness and thus in the sustained growth and development.

Consequently, the telecommunications sector needs a regulatory agenda and public policies that help promote the adoption of those technologies far beyond presidential periods.

Therefore, a new Regulation for Convergence technologies or a Convergent Regulation must consider that:

1. The couple Network/Service is already completely dissociated. Traditionally, an operator obtained a concession to exploit a network for one service only. When the regulator established the conditions for network construction (rules for spectrum use, signage, etc) the characteristics of the service provided were automatically delimited. We need to move away from this so a convergent regulation must recognize that the networks now are multi-services and that their ability to integrate multiple applications from third parties make them also multi-play service provider.

2. The authority must maintain a centralized administration of the limited resources of the Nation such as the spectrum, in a way that exclusive exploitation by the licensed operators is guaranteed but tending to eliminate any regulations on the services delivered. Thus, a license for local telephony must only be such, without adjectives a "fixed", "mobile", "wired" or "wireless". The spectrum allocation mechanisms must be kept and even promoted, but at the same time, the locks that force the operators to keep obsolete technologies must be revoked.

3. The function of the regulator of executing controls to promote a healthy competition and an environment of different choices for the client is increasingly important.

4. The BBINT convergence process makes necessary to reevaluate the definition of basic service in light of the Internet era and the new service offering

5. With the BBINT convergence process, the operators will benefit of large savings derived from scale economies and scope. In highly competitive markets s fixed telephony, these savings are generally transferred to the users, but in those markets with little competition, it is important that the regulator balances the convenience of transferring savings to the user with the need for more investment.

V. CONCLUSIONS

Mexican market shows potential for growth due to significant pent-up demand for connectivity and the expectations of improvement in the macroeconomic climate during the next six years of new Presidential administration. Mexico is a dynamic telecoms market second only to Brazil in Latin America in terms of the size of the services market. Low levels of penetration across segments and positive macroeconomic prospects translate into good opportunities in the years ahead, particularly for players already in the market.

For Mexican operators Telmex and América Móvil (owner of Telcel), opportunities arise at the local and international levels. In the absence of significant regulatory changes and capital injections into competing carriers, Telmex and Telcel's grip on the market could grow stronger. Their success has enabled them to build the resources necessary for aggressive international expansion. America Móvil has rapidly become the largest mobile operator in the region and an important challenger to Telefonica group across Latin America and is poised for growth in Brazil, where it recently consolidated its operations and acquired new licenses [5].

Latest alternatives for new competitors in the market and competition considering a neutral interconnection policy must be sought after in order to increase coverage and quality, particularly of high speed services tending to lower prices. The efforts must be focused towards the implementation of high speed Internet throughout the country, particularly in rural areas, supported by accurate interconnections and strategies for network neutrality. It is necessary that the regulatory authorities in Mexico facilitate the entrance of competition in the market in order to accelerate technological innovation and lower the price of the services. Among the identifiable elements that prevent the entrance of competition in the market we can mention: limits to foreign investment that can act as protectionist measures for some operators already established in the market.

Finally, it is imperative to say that the core aspect of service convergence will be content transmission. This is the reason why it is critical to promote competition in this field, because contents will act as catalysts for the adoption of convergent offerings. A suggestion for the authorities in Mexico is to promote the entrance of investment for content development in such areas as radio, T.V. and Internet.

Today it is in the hands of the industry and authorities of the sector to effectively profit from telecommunications as a leading sector to access a superior level of integral development for the country.

VI. ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to the companies Select, RED Magazine, The Competitive Intelligence Unit, the TELECOM-CIDE institute and Pyramid Research for the usage and reference of part of their reports in this work. I also want to thank my wife Jamehel for her helpful support and comments to structure an earlier draft of this document.

VII. REFERENCES

1. G. Chavez, ISCC2005 paper: "Telecom Deregulation and Fast-changing Broadband Internetworking Technologies: Status, Impacts and Trends in the Mexican Market."
2. C. Islas, "Global Telecom 97 Opening Speech", October 1997.
3. Select, "Tendencias 2007", Annual Business Strategies Meeting, November 2006.
4. Gabriela Baez, "Pyramid Research. Communications Markets in Mexico 2006 Edition, January 2006".
5. The Competitive Intelligence Unit & The Institute of the Americas "Infocom-Mexico report 2006".