IP Telephony and the Internet: Colombia Case Study

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This case has been prepared by Gustavo Peña-Quiñones <gpenaq@col1.telecom.com.co>, with the assistance of Agustina Guerrero, <agustina@baedigital.com.ar>. "*Colombia: IP Telephony and the Internet*" is part of a series of country case studies produced in connection with the Third World Telecommunication Policy Forum (WTPF) on IP Telephony, Geneva, 7-9 March 2001. The WTPF case studies programme is under the direction of Dr. Ben Petrazzini, <Ben.Petrazzini@itu.int> Regulatory Affairs Advisor, Strategy and Policy Unit (SPU), ITU. Other IP Telephony cases, including Canada, China, Republic of Korea, Peru and Thailand, can be found at <http://www.itu.int/wtpf/casestudies/>. This report reflects the opinions of the authors and does not necessarily reflect the views of ITU, its membership, or the government of Colombia.

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1. Introduction

In Colombia, the entire telecommunication sector now operates in a competitive environment. There are more than 50 operators providing basic local telephone service, four cellular telephone operators, and over 100 value-added operators (see Box 1). Although the first liberalization provisions were put into place in the early 1990s, it took more than seven years to open up long-distance service to competition, and during that time the process was subject to various pressures from the main players involved.

The Ministry is currently preparing a new Telecommunication Statue aimed at fostering development of the sector in an environment of new technologies, convergence, connectivity and multimedia services, based on the principles of user protection and healthy competition.

In December 1998, Colombia became the first country in Latin America[1] to offer long-distance service from mobile telephones using Internet technology. The key factors in the emergence of this service were the rapid advances in IP technology, the bold commercial moves on the part of one cellular company and an apparent lack of clear regulations governing cellular and Internet Telephony. The process of opening up the telecommunications sector to competition gave rise to a number of disputes and to some investigations led by telecommunication regulatory and oversight bodies, and a great upheaval in the sector.

Three operators participated in providing long-distance service from mobile telephones using Internet technology, two from their cellular networks and one value-added operator that completed the link. After nearly nine months of operation, the service was suspended at the initiative of the value-added operator.

The various authorities involved have recently brought four investigations concerning the use of Internet Telephony to a close (see Table 6). The first of these concerned the Telecommunication Regulatory Commission[2] (CRT), the Colombian regulator, which closed the administrative investigations into *Comunicación Celular S.A*. (Comcel) without any major resolutions on the subject. However, the long-distance companies Orbitel and *Empresa de Telecomunicaciones de Bogota* (ETB) have challenged the decision of CRT, and these appeals are pending.

In the second investigation, the Ministry of Communications[3] (MinCom) fined each of the cellular and value-added operators an amount equivalent to 900 times the monthly minimum wage (approximately US$ 120'000).

The third involved the Office of the Superintendent for Trade and Industry[4] (SIC). This case was brought against Comcel for unfair competition and a fine of US$ 230'000 was imposed (equivalent to 2'000 times the monthly minimum wage). The long-distance operators are in the process of submitting a claim for some US$ 54 million for the damages generated by the conduct of the IP Telephony Service Provider (IPTSP).

In the light of the administrative actions against Comcel, the *Fiscalia de la Nacion* opened a fourth criminal process against that company. Yet, given the resolution of the Constitutional Court, which declared the law that provided the basis for the process (Art. 6 of Law 422/98) as unconstitutional, *Fiscalia de la Nacion* closed the case in October 2000 without any findings against Comcel.

The prosecution of the cellular and value-added companies for providing IP Telephony services over their networks is one of a number of actions

brought by the national administration to deter the diffusion of illegal or unauthorized IP Telephony services in the country.

In the second half of 1999, in response to complaints by long-distance operators, and on the basis of allegations to the effect that unauthorized international voice transmission services were being provided by some operators, the judicial authorities conducted inspections of the head offices of more than 20 operators legally established to provide value-added services. Some of the operators were closed down and charges were brought against them. Judicial authorities issued detention orders for the general managers or presidents of most of those companies. These cases, however, were dropped during 2000 due to a sentence of the Constitutional Court that declared Article 6 of Law 422/98 unconstitutional, and this decision led to the suspension of the trials in the lower courts.

The agencies responsible for developing policy and regulation for the telecommunication sector in Colombia are facing up to the challenges posed by globalization and convergence, while at the same time, they have embraced the task of promoting the development of the Internet as laid down in the National Development Plan.[5] These agencies are being called upon to resolve the delicate conflicts that have arisen as a result of operators with value-added licences offering IP Telephony services.

Box 1: Market structure and policies

The current regulatory framework of the Colombian telecommunications market

- All services are provided on a competitive basis.
- Network installation and service provision is fully regulated and requires prior authorization from this Ministry.
- The use of technologies, particularly IP-based technologies, is unrestricted.
- Service operators are ensured access to and use of networks and are entitled to cost-based remuneration for use of their networks.
- There are clear rules on interconnection and to prevent abuse of a dominant position.
- Service providers and network operators are free to use IP technologies for those services which they are authorized to provide.
- Internet access services are provided on the basis of open competition. Through a national policy entitled "Agenda for Connectivity", the Government is promoting initiatives aimed at fostering Internet access for less privileged members of society and use of information technologies by companies and the State.
- Similarly, private investment is actively encouraged and foreign investment is allowed without restriction, with the exception of broadcasting services which are subject to limits set by law.

Source: Colombian Ministry of Communications.

Table 1: Key events in the Colombian telecommunication sector, 1990-2000

Year	Key events	Summary
1990	Liberalization provisions	Provisions are adopted for the opening up of the telecommunication sector to competition, and the entire sector is regulated by Decree-Law 1900, which has the validity of an act.
1991	Political Constitution of Colombia amended	Introduction of the new Political Constitution of Colombia, which authorizes the provision of public telecommunication services by private companies and outlaws monopolies.
1992	First attempt to privatize Telecom	A draft act on the privatization of Telecom, the State-run company responsible primarily for the provision of the long-distance service, is submitted to the Congress for consideration.
	Telecom strike	In opposition to the privatization of Telecom, the latter's union, supported by the unions of other companies, call a strike, bringing telecommunications and part of the country's economy to a standstill.
	First licences granted to value-added operators	The first companies are authorized to provide value-added services, with numerous operating options. The Government of the day may have adopted this approach in order to smooth the way for the new service as an alternative designed to lessen the impact of any shutdown of the telecommunication sector as a result of Telecom's monopoly and its labour problems.
1993	Beginning of competition in local telephony	Emergence of the first joint local telephony ventures and widespread growth of new telecommunication services.
	Act on cellular telephony	The Act on cellular telephony is brought into force.
1994	Start of cellular services	Six licences are granted to cellular operators.
	The *Comisión de Regulación de Telecomunicaciones* (CRT) is established	Act 142 on public utilities is brought into force, establishing the telecommunication regulatory (CRT), and energy and water commissions, consolidating the options for liberalization of the basic local telephony services, authorizing CRT to draw up liberalization provisions for the long-distance telephone services, and setting out a clear regulatory framework for the basic telephone services defined as utilities. The Act also established the *Superintendencia de Servicios Publicos Domiciliarios* (Office of the Superintendent of Public Utilities), a body responsible for the supervision and monitoring of public utility companies and user protection.
1995	Long-distance liberalization	Adoption of initial provisions for liberalization of the long-distance service.
	New local carriers	The first local telephone companies commence operations.
1996	Competition and interconnection provisions	CRT issues clear regulations on competition, interconnection, access and usage charges, liberalization, etc.
	Initial requests	Requests made to the Council of State to the effect that CRT should establish provisions in respect of liberalization.
	Further industrial disputes at Telecom	An industrial dispute arises at Telecom. The issues include liberalization of the long-distance service, in which the union attempts to intervene.
	Liberalization process brought to a standstill	In August, a Telecom strike is averted with the Government's promise to allow further study and discussion of the liberalization process. This brings CRT's establishment of regulations to a standstill.

(continued)

Table 1 *(continued)*

1997	Liberalization process re-launched	On CRT's initiative, a plan is developed with a view to the liberalization of the long-distance service, backed up by a contingency plan to ensure continuing communications in the event of the paralysation of basic telecommunication services, based on use of the networks of all telecommunication service operators, and in particular those of cellular and value-added operators.
	CRT under pressure to proceed with liberalization	Five major local carriers go to court in defence of their equal rights[1], requesting that CRT be obliged to regulate the liberalization of the long-distance service and that local companies be allowed to participate.
	Liberalization regulated	CRT introduces regulation of liberalization establishing, among other things, a licence price of US$ 150 million and stipulating that 150'000 local telephone lines must have been brought into service by 31 December 1996.
	Illegal telecommunication service made punishable	In December, the Congress issues Act 422 setting a penalty of up to six years' imprisonment for anyone providing illegal telecommunication services.
1998	First licences granted to new long-distance operators	Two local telephone companies, ETB (Bogotá) and EPM (Medellín), the latter being 49 per cent owned by the country's two biggest corporate groups, each acquire a licence for the provision of long-distance service.
	Liberalizing long-distance	In December, the new operators commence long-distance service provision.
	Voice over IP service launched	On 22 December, Comcel launches its #124 long-distance call service at Col$ 770 a minute.
	Investigation of Comcel	On 23 December, CRT begins an investigation of Comcel's #124 service.
1999	Other investigations launched	Separate investigations against Comcel are initiated by the Ministry of Communications and the *Superintendencia de Industria y Comercio* (SIC).
	Pressure in respect of bypass traffic	Long-distance service operators put pressure on the Government by not paying their licence fees in protest at the existence of long-distance service traffic not being routed through them.
	Intervention by the Public Prosecutor against value-added operators	Investigations are initiated by the Public Prosecutor into unauthorized long-distance service provision.
	End of cellular exclusivity	The exclusivity originally granted to cellular operators comes to an end.
	Year of investigations	The investigations of Comcel by CRT, the Ministry of Communications and SIC continue throughout the year.
2000	Ministry of Communications investigation of Comcel concluded	On 2 February, the Ministry of Communications' investigation of Comcel ends with the adoption of Resolution 70.
	Internet promoted as part of Government policy	In February, the National Government launches its Agenda for Connectivity.
	SIC investigation of Comcel concluded	On 13 March, Resolution 4974 of the *Superintendencia de Industria y Comercio* concludes that Comcel has engaged in unfair competition and diversion of customers and imposes a penalty on the company accordingly.
	Ruling on appeals	On 8 May, the Ministry of Communications upholds Resolution 70, but reduces the penalty.

(continued)

Table 1 *(continued)*

2000	SIC rules on appeal	On 13 June, SIC upholds the resolution.
	Comcel files lawsuits	Comcel: 1. Files a lawsuit against the Ministry with the *Tribunal Contencioso Administrativo*; 2. Appeals and subsequently files a complaint with the hierarchical superior of SIC, and goes to court on the grounds that its fundamental rights are being seriously undermined owing to its requests being ignored. (See the details of the Comcel case.)
	Unconstitutionality of the law penalizing illegality in telecommunications	Ruling by the Constitutional Court on Act 422 98, leaving all the investigations carried out by the Public Prosecutor into the termination of international calls via value-added operators in Colombia hanging in the air.
	Scope of regulatory functions	Ruling by the Constitutional Court on Article 69 of Act 142 94, clarifying the scope of the functions of the regulatory commissions (i.e. telecommunications; energy and water).
	Compensation for loss of revenue due to bypass traffic	The long-distance operators Telecom, ETB and Orbitel call for compensation for loss of traffic.
	Flat-rate tariff	CRT issues new tariff regulations for Internet access.
	One of the investigations into Comcel concluded	On 29 October, the Office of the Public Prosecutor concludes its investigation of Comcel.

[1] The term used in Spanish is "*tutelar*", which refers to the bringing before a judge of a legal action for the speedy protection of right guaranteed under the Constitution when a person's fundamental constitutional rights, life, due process of law, etc., are at risk. Such action is used only as a last-resort means of defence or when the person is exposed to serious and irremediable damage.

Source: Research by the author.

[1] According to the operator's advertising when it began offering the service.

[2] *Comision de Regulacion de Telecomunicaciones*

[3] *Ministerio de Comunicaciones*.

[4] *Superintendencia de Industria y Comercio.*

[5] On February 2000 the President of the country issue a document entitled "The Connectivity Agenda: The Internet Jump", that presents a number of strategies and actions calling the country to embrace the information technologies with the aim of constructing the information society as national goal.

2. Telecommunications in Colombia

2.1 Introduction

Although Colombia may enjoy a favourable geographic location, its situation is one of the most controversial and complex among all the countries of the continent. For the past 50 years it has experienced continuous economic growth, despite the social conflict[6] that it has suffered throughout the same period. It was only in 1999 that the economy experienced a sharp downturn. The country's topography,[7] with a surface area of 1'141'748 km^2, mountain ranges, forests, valleys and rivers, and its own characteristic pattern of population distribution, with the main cities being located in the country's interior in the upper parts of the Andes, has constituted key challenges for the development of communications. Most of the Colombia's 40 million inhabitants[8] are concentrated within one-third of its surface area. The security situation has contributed to a higher level of urbanization than might otherwise have been expected, with the result that most of the population is to be found in some 50 cities with over 100'000 inhabitants, and according to DNP (<http://www.dnp.gov.co>) they account for over 71 per cent[9] of the urban population. Moreover, these cities are served by 85 per cent of the country's telephone lines.

According to the National Administrative Department of Statistics (DANE <http://www.dane.gov.co>), the Colombian economy grew by 0.6 per cent in 1998. The growth rate in the communication sector fell from 18.1 per cent in 1997 to 8.8 per cent in 1998. The GDP per capita in 1996 was US$ 2'185.[10] One factor which has had a drastic effect on the economic and social situation of the country in recent years is the high level of unemployment, which, at around 20 per cent, has had a considerable influence on personal safety and the well-being of the community. In 1997, the average number of people per household was 3.5, the average income per household was only 370'000 pesos (some US$ 350) per month, and the illiteracy rate was 11.3 per cent. Furthermore, the income was largely concentrated within a small proportion of the population, to be found in the main towns and cities. Despite being one of the world's major coffee producers, Colombia has diversified its output, with oil and other products now making a significant contribution to national production.

2.2 General status of telecommunications

Colombia's geographic features, the distribution of its population, the fact that the main cities are located in the upper parts of the Andes mountains, the existence of isolated areas that are inaccessible by means of transport and the tropical and inhospitable conditions that prevail, are all factors which make the telecommunication sector one of the most important for the country's development. It is for this reason that intensive use of the Internet is, and will continue to be, of key importance. The concentration of wealth in Colombia has been a critical factor in the country's economic and social development and will prevent most of the population from accessing the services provided by the Internet. According to DNP, the "unsatisfied basic need indicators" fluctuated in 1993 between 59.5 and 21.7, as with most developing countries, the rural areas are where the most unfavorable conditions are to be found. As already mentioned, 70 per cent of the country's population lives in cities with over 50'000 inhabitants, which is precisely where the basic telephone service is available, with 84 per cent of lines, accentuating the difficulty that people in rural areas and on low incomes have in gaining access to service. One has, moreover, to take into account the

peculiar manner in which local telephone companies are called upon to provide their service, since they are obliged to provide subsidies to low-income population groups.[11] The situation is therefore one in which a relatively high penetration of telephones has been achieved in the cities, even in low-income groups.

There is a certain degree of competition in the area of local telephony[12], and although the fixed line penetration rate in most cities is relatively high, with high level income groups having at least one telephone line per dwelling, and with low-income groups the rate averaging between 10 and 20 per cent, the lack of subsidies and the high overall cost of access has led to low levels of Internet penetration. Fortunately, many parts of the country have been witnessing the spontaneous appearance, thanks to private initiatives, of Internet cafes, kiosks or public facilities where computer terminals are available to provide access to the network at more or less reasonable prices (5'000 pesos—or US$ 2.80—per hour of connection time).

In 1990, when a process of opening up began in the telecommunication sector, the first comprehensive provisions were put into place. However, the pressures exerted by certain players (unions within the monopoly enterprise, economic and political sectors) resulted in the process taking seven years and being structured within the framework of coercive forces that prevails in Colombia. The long-distance service effectively remained a monopoly until 1999, when two new companies came onto the market following its deregulation in 1997. Until 1997, tariffs were kept at a high level—a situation that seems to have been exploited by value-added operators. Licences granted after 1992 and following the Telecom strike[13] were fairly broad in scope, specifying little in terms of what they authorized[14], all of which has resulted in a lack of regulatory clarity.

Furthermore, as from 1994, cellular operators became new players in the field of telephone service provision, including the domestic long-distance service[15], as a result of the way in which the regulations and licences were structured. In the absence of any clear regulatory provisions governing interconnection, the Government exerted its power over Telecom, the sole long-distance operator at the time, forcing connection without all of the corresponding economic and financial issues having been resolved.

Finally, the trunked access (trunking) service, given the nature of the equipment it uses and of its network, is in a position to compete with the mobile service, and possibly to an even greater degree were it to be assigned numbering.[16]

Table 2: Telecommunication objectives forecast for Colombia: 1998 to 2002

	Units	1998	1999	2000	2001	2002
Population	Inhabitants	40'772'994	41'539'011	42'229'301	43'035'394	43'775'839
Investment	US$ 10 x 6	1'003	1'471	1'301	1'363	1'466
Fixed lines	lines	7'593'419	8'231'889	8'949'279	9'351'823	9'935'212
Mobile Cellular	subscribers	1'800'229	2'227'000	2'620'000	2'937'000	3'237'000
Paging	subscribers	112'000	164'690	220'650	271'730	312'790
Teledensity	%	18.62%	19.82%	21.19%	21.73%	22.70%
Mobile density	%	4.42%	5.36%	6.20%	6.82%	7.39%

Source: adapted from Mincom, 1999.

Thus, the local basic telephony service is provided by 50 companies which form five corporate groups (the majority owned by municipalities or the State), with almost seven million lines in service, concentrated in the largest cities, where the regulations make it mandatory to subsidize low-income users through the revenue generated by imposing a surcharge on high-income users. The long-distance sector comprises three operators, two of which began providing service in early 1999; two of them are State-owned[17], while the other is only 50 per cent privately owned by Colombian interests. The mobile service is provided by four companies to which the A and B bands are assigned; together they account for some two million users. The value-added service is available from over 100 companies, and the trunking service is provided by four companies with national coverage, one of which possesses a system and network that are fairly similar to those of the cellular operators, as was mentioned earlier.

2.2.1 Prices and tariffs

Since its creation, CRT has been responsible for tariff regulation throughout the sector; however, it has been active only in the regulation of tariffs for the basic (local and long-distance) service. Its regulations provided for controlled tariffs through adjustments on the basis of formulas geared to ensuring efficiency[18] for incumbent operators and tariff-setting freedom for new operators or entrants.

The cellular mobile service, like other telecommunication services, has unregulated tariffs, although they could be regulated at any time if CRT so decides. The tariff regulations have been modified by Acts[19] intended to change the prevailing structure in certain services. Such interventions have served to create confusion in the regulatory structure, all the more so if one bears in mind that legislation in Colombia, as in most other countries, undergoes many changes in the processes of study and adoption.

Generally speaking, the tariff regulations adopted by CRT seek to do away with subsidies and to set up pricing mechanism closer to a cost-based system. To this end, and at this entity's initiative, SSP established regulations for a single accounting system of prices and costs for companies providing basic services. This system was first put into practice in 1999.

A process of tariff rebalancing was begun in 1996, including the setting up of an economic procedure for interconnection and involving far-reaching changes to the system of participation agreements between local and long-distance companies by establishing charges for access and use that represent real call termination costs. The results of this restructuring, as yet unfinished, will have a strong impact on Internet access, since the charges per time unit of local connection have increased considerably, benefiting users of the long-distance service, where charges have been substantially reduced, and those users are experiencing the impact of the wide variety of economically attractive offers currently being made.

2.2.2 Composition of the market and competition

The competition in local telephony remains confined to State-owned companies. In the international long-distance sector, three of the five entities involved are State-owned, and the remaining two private companies are linked to one of the three operators. The domestic long-distance sector, however, includes cellular operators and companies of private and mixed origin, associated with two private investors participating with a long-distance operator in the provision of this service, these being investors who in turn compete with one another in the mobile service. In a way, the trunking service competes, or seeks to compete, with cellular and value-added operators when they carry voice and when they intervene in the long-distance market.

Table 3 shows a comparison of the prices of the services provided by the different operators. It does so from a broad point of view, without taking into account the regulatory restrictions that

prevail within Colombia's market structure. The convergence of different services, many of which present similar features, is a fact. For example, cellular operators compete with fixed or basic operators, the trunked service competes with cellular operators, and so on.

As can be seen from Table 3, the price structures of the different services, where competition is possible, are marked by significant discrepancies. At the regulatory level, the local market prices are regulated when the operator is established, and when cellular and trunking services may compete with one another. Price structures are subject to different marketing and competition programmes, since each service has its own level of competition. Although the Internet does not influence cost structures and levels of service internally, it does have an effect on the external market, where since 1999 it has constantly been providing special offers and discounts.

The attitude of the user with respect to such services varies according to the type of call in question. While many users are not concerned with quality but cost, provided the connection is of an acceptable standard, whereas, corporate users or individuals within a company attach far more importance to quality than to price. Within this context, the bigger business user requires high traffic volumes, seeking data handling solutions or direct private connections with remote offices, while the medium-sized business customer will use public services, and the medium and high-income domestic user will make use of all the available options, but still making cost a priority.

2.3 Organization

In the past, the telecommunication sector in Colombia was governed by the Ministry of Communications. In 1990, however, Act No. 1900 of 1990 was passed, marking the first steps toward the opening-up of the sector. In 1991, the new Political Constitution was adopted, marking a new step towards deregulation. The provision of domestic public services was given a structure and the *Comisión Nacional de Televisión* (CNTV) was established, consolidating, in principle, the legal framework for the deregulation of telecommunications, which was developed with the passing of the Act on Domestic Public Services in 1994 and put into its final form in July 1999. At the institutional level, there remained five government entities governing telecommunications, each having a different regulatory function:

1) The Ministry of Communications (Mincom), responsible for policy, the granting of licences and spectrum management.

2) The *Comisión Nacional de Televisión* (CNTV), a constitutional body responsible for all functions relating to television, including management of the spectrum allocated to this service.

3) The *Comisión de Regulación de Telecomunicaciones* (CRT), responsible for regulatory matters relating to competition, tariffs and interconnection for basic local and long-distance telephony, set up under the Act on public services, and having last year been made additionally responsible, under Decree No. 1130, for the regulation of all other telecommunication services, for the definition and drawing up of basic technical plans and for proposing the national telecommunication plan.

4) The *Superintendencia de Servicios Públicos Domiciliarios* (Office of the Superintendent for Domestic Public Services) (SSP), responsible for supervising and monitoring the provision of domestic public telecommunication services, including local basic and long-distance telephony.

5) The *Superintendencia de Industria y Comercio* (Office of the Superintendent for Industry and Trade) (SIC), responsible for detecting and controlling restrictive and unfair practices in the area of competition in telecommunication services of a non-domestic nature. There are also a number of trade union organizations within the sector, including the *Cámara Colombiana*

de la Informática y las Telecomunicaciones (Colombian Chamber of Informatics and Telecommunications) (CCIT), the Asociación de Empresas de Servicios Públicos Andesco (Andean Association of Public Service Enterprises), and the *Asociación Nacional de Empresas de Telecomunicaciones de Colombia* (National Association of Colombian Telecommunication Enterprises) (ADETELCO).

2.4 The Plan

The aim of the present Government's National Development Plan, called "Goals for Constructing Peace", is to open up access to communication services for all citizens through extending coverage to all parts of the national territory.[20]

In addition, the Plan sets out five strategies: consolidating the national coverage provided of telecommunication services; strengthening the regulatory and institutional framework; consolidating the deregulation of the telecommunication market; fostering the private participation of new players in the provision of services; and facilitating the development of the information infrastructure. Moreover, the National Informatics Plan establishes, among other things, strategies for developing a Government intranet, for using the Internet

Table 3: Telecommunication service prices in Colombia

Service	Average price per minute in 1999 (US$)	Remarks
Local telephony	0.007 to 0.015	High and medium incomes
Regional telephony	0.04 to 0.14	Service within *departamentos* or State
Domestic long-distance	0.04 to 0.22	Service throughout the country. The cellular service is also national.
Cellular to cellular	0.03 to 0.20	Calls within the country
Fixed or local to cellular	0.19 to 0.42	Calls within the country
Comcel service (#124)	0.42	Service provision ceased in September 1999
Cellular to fixed	0.03 to 0.20	The value of long-distance is added
Fixed to trunking	0.34	
Trunking to trunking to fixed	0.16	Charged by the second on-air
International calls to neighbouring countries	0.19 to 0.30	Average, taking account of special offers
International calls to the United States	0.19 to 0.41	Average, taking account of special offers
International calls to other countries	0.19 to 0.49	Average for European countries
Access to Internet - switched ISP	16.22 per month	Same charge regardless of use
Access to Internet via cable	70 per month	Same charge regardless of use

Note: All the above values are exclusive of Value Added Tax at 16%.

Source: Research by the author.

with emphasis on intercommunication, and for periodically updating standards for the standardization of technological guidelines.

2.5 Services

Table 4 shows, within the context of the regulations in force, information relating to licences granted by the Ministry of Communications, income for each of the services and the corresponding number of users. It will be seen that there are various operators and that there is generally competition within the sector, particularly if one takes into account technological convergence and the manner in which the differences between the services established under Colombian legislation are becoming blurred.

2.5.1 Basic telephony

In the area of local basic telephony, there are more than 50 authorized enterprises and 39 providing this service. In some cities there are up to three operators, each with its own network, generating a degree of competition. These smaller operators, working on the local level, have in some cases joined together to form larger groups, operating at the national level.

Telecom, owned by the Government, which held the monopoly for the national and international long-distance service, now owns the controlling share in 16 smaller companies providing service in secondary and tertiary cities and in other areas of the national territory, including Bucaramanga, Bogotá, Barranquilla, Cali and Manizales, owning a little over 35 per cent of the country's internal lines.

Empresa de Teléfonos de Bogotá (ETB), under municipal ownership and currently in the process of privatization, holds 29 per cent of the country's lines, and is a new entrant in the provision of long-distance service.

Empresas Públicas de Medellín (EPM), also under municipal ownership, with 18 per cent of lines, is the third long-distance operator.

Transtel S.A. is owned by private investors, with three per cent of Columbia's internal lines.

Table 4: Licences and income for services in 1997

	SERVICE	Licence	Gross Revenue (US$ Million)	User
1	Local	55	1'090	6'000'00
2	Long-	3	1'262	
3	Mobile	6	415	1'500'00
4	Trunkin	38	9	30'00
5	Paging	120	60	200'00
7	Value added services Telematic	164	309	n.a.
			3'145	7'730'00

Note: In 1999, there were 12 mobile licences and two for global systems (Iridium and Globalstar).

Source: CRT, information for 1997.

Empresas Independientes, primarily under municipal ownership, with 14 per cent of the lines. The dominant player in this group being the *Empresa de Telecomunicaciones de Cali*, with over 500'000 lines in service.

Although basic local telephony has been deregulated and is fully open to competition, today no genuine competition can be seen between these five groups, and as the recent sale of ETB and the probable sale of one or two the other groups shows, in the future two or three corporate groups will retain control over this service, effectively reducing the forces of competition.

The long-distance service was effectively opened up to competition in 1999, with the introduction of two new operators, after many false starts, and in the face of strong union and political pressure. Although in theory, it was fully deregulated much earlier, there remained significant entry barriers, including the cost of the licence (US$ 150 million) and the requirement to have over 150'000 local lines in service as at December 1996, all of which limited the ability of new competitors to enter the market. Cellular mobile telephony operators are authorized to provide long-distance service at the domestic level and indeed do so, since the cellular service is considered to be national. New long-distance operators therefore compete with one another in providing the international long-distance service, and with the cellular companies in providing the domestic service, this being a key factor to take into account when studying the structure of the sector as a whole, particularly in view of the convergence of services that is happening to a greater degree in the context of the Internet.

2.5.2 Cellular mobile telephony

Provision of this service began in 1994, with the country being divided into three zones, within a structure involving one private and one mixed operator per zone (i.e. a total of six operators), and allowed these operators to enjoy a five-year period of exclusivity (which came to an end on 1 September 1999). The Congress recently adopted regulations for PCS licences, and the corresponding competition is expected to be held next year. So far as the process of company consolidation is concerned, there are currently only four operators, and at the national level this may fall to only two in the long term, thereby doing away with the zones originally established.

2.5.3 Value-added and telematic services

As from 1992, and following a major Telecom strike, the Ministry of Communications made this service subject to regulation and began issuing licences. To date, 164 companies are authorized to provide value-added services, in addition to which they are generally authorized to provide services through the Internet.

2.5.4 Other services

In the area of trunking there are 38 companies, ten of them using their licence for private telecommunication activities and only four being authorized to operate at the national level. They have over 50'000 users. In the area of radio paging, there are 120 local operators accounting for over 200'000 users. Twelve licences have been issued for the carrier service. Private networks have in all cases to be authorized by the Ministry of Communications. Global systems (Iridium and Globalstar) were authorized in 1999.

In the area of sound broadcasting, there has been a great proliferation of commercial AM and FM radio stations, with a total of 1'338 licences having been granted to community stations providing a public service.

So far as television broadcasting is concerned, the National Television Commission has granted over ten licences to subscription television operators, and there are licences for five national, seven regional and four local channels.

2.6 Networks

The national networks operated by Telecom reach almost every corner of the country, while those of *Interconexión Eléctrica S.A.* (ISA),

cellular operators and a number of private network and value-added network operators provide regional coverage and connection to other countries. Telecom's network was constructed within the framework of a monopoly enterprise providing all services, and, as in most other countries at that time, the operator also performed regulatory activities. It now has a digital microwave network covering most of the national territory, a fibre-optic network exceeding 4'000 km in length, and an analogue microwave network. In addition to this, it has a PDH, an SDH and a fibre-optic trunk network.

For its network, ISA took advantage of the national grid to construct a fibre-optic network using digital technology based on STM-16 systems, linking the main cities of Bogotá, Medellín, Cali and Barranquilla, and the company expects to extend the network to 18 further cities in the near future. It also has a digital microwave radio-relay network using SDH technology with a number of satellite connections.

In addition to the above, the new long-distance operators have supplemented ISA's network with extensions which comply with their service provision expectations. Likewise, the cellular operators have constructed networks of their own that are supplemented by a number of leased portions. Finally, a number of regional operators such as ERT and EDATEL have constructed networks of their own, covering the regions of Antioquía and Valle del Cauca.

[6] According to Nicanor Restrepo in "El derecho a la Esperanza", if the security situation in Colombia was similar to that in neighbouring countries, the average annual economic growth rate would have been 9 per cent, which in his estimation would amount to US$ 42'999 million.

[7] *Source:* Atlas de Colombia, Instituto Geográfico Agustín Codazzi, fourth edition, 1992.

[8] Source: DANE (<www.dane.gov.co>).

[9] Source: DNP (<www.dnp.gob.co>).

[10] For economic performance data for the period 1950 to 1997 see <http://www.banrep.gov.co/estad/dsbb/srea_001.pdf>.

[11] Dwellings have been classified according to their quality, and not in terms of a direct relationship with the owner's income. This system is known as stratification, the dwellings having been categorized into six strata, where stratum six denotes the highest income and stratum one the lowest. The tariff structure established in the past enables and obliges each company in each city to impose a surcharge of up to 20 per cent for service provision at strata five and six, i.e. those relating to the highest income brackets. This surcharge, known as a contribution, is intended to subsidize subscribers in the lowest income strata (i.e. 1, 2 and 3) with respect to tariffs for fixed and variable consumption and connection charges. This system makes it possible, within a single company and city, to provide for tariff-based cross-subsidies in the basic telephone service between high-income and low-income subscribers.

[12] Three companies are operating in Bogotá, one with two million lines, another with 300'000 lines and the other with 30'000 lines. Competition is also present in other cities.

[13] In 1992, when the first attempt was made to deregulate the telecommunication sector through the privatization of Telecom, the country was paralysed by a major strike lasting over ten days.

[14] Licences for the provision of value-added and telematic services with national and international coverage, establishing that the services in question lie in the realm of data-processing. Services lying in the realm of transmission, including point-to-point and point-to-multipoint voice transmission services without connection to the public switched telephone network. Also, authorization for the installation of a value-added network for the provision of this service, with national and international coverage, using radio waves, physical cables and satellite systems coordinated for Colombia, including the corresponding uplinks and downlinks. Taken from a licence granted in 1993.

[15] Article 1 of Act No. 37 of 1993 provides that the cellular mobile telephony service is a public service of national scope and providing national coverage.

[16] Local numbering has been recently assigned to it by CRT.

[17] Telecom: 100 per cent State-owned; ETB: owned 100 per cent by the city of Bogotá; Orbitel: owned 51 per cent by the city of Medellín.

[18] The CRT report refers to the following achievements:

√ Access charges are fully operational, following a levelling process lasting almost two years.

√ Local service tariffs have risen in real terms by a little over 20 per cent in the past two years, with an estimated real growth in local telephony service prices of some 30 per cent.

[19] Act No. 422 of 1998 provides that users of a telecommunication operator who set up a call that requires the services of one or more interconnected operators shall pay for those services in full at the tariff established by each of the operators or by the competent authorities, in accordance with the tariffs in force for each service.

[20] Telecommunication sector - current situation and forecasts, Ministry of Communications, May 1999.

3. The Internet in Colombia

Telecom, the old State-owned telecommunications incumbent,[21] established its first Internet connection in March 1994. The precursor to that connection, however, dates back to 1986, when a group of Colombian institutions joined together in an effort to establish computer services for the country's higher education system. The institutions taking part were the University of the Andes, the National University, the Colombian Institute to Promote Higher Education (ICFES) and Telecom. The network they established was the National University Network of Colombia (RUNCOL). By entering into payment-for-service contracts and by skirting administrative rules and procedures, this group of institutions succeeded, in 1990, in establishing a 9.6 kbit/s satellite link between the University of the Andes in Colombia and the Columbia University in New York. This was the first step in providing access to a global data network through connection to Bitnet[22] (see Figure 1). This access was initially used as a working tool by the academic and scientific community, such as the Telecommunications Institute (ITEC) an arm of Telecom dedicated to teaching and research, and other pioneering universities in this field.

Thanks to a joint effort by several universities, with support from Panamsat[23] and assistance from ICFES and Colciencias (the Science Council of Colombia), an Internet connection was established in May 1994 for the node of the University of the Andes Computing Centre[24]. Initially, this provided direct access for the entire Andes academic community. Access was gradually extended to the general public, free of charge, and the number of users eventually totalled more than a thousand. Subsequently, this venture cam to be known as CETCOL (Colombian Science, Education and Technology); it used the network known as INTERED and opened as a fee-paying service available to the general public.[25] For its part, the University of the Andes succeeded in being assigned responsibility for administering the <.co> domain and the Class B address in 1991.

Initially, the spread of the Internet was a great concern for Telecom, since the Telecom commercial arm assumed that the Internet would lead to a reduction in the use of the X.25 data network. Nevertheless, in 1994, Telecom connected itself to the Internet to provide an internal service for consultation by its staff, at speeds of 9.6 kbit/s. Soon after, this connection was opened to the general public and a special service was set up called SAITEL (Telecom Internet Access Service).[26] This was the first commercial Internet service provider (ISP) available to the general public in Colombia.

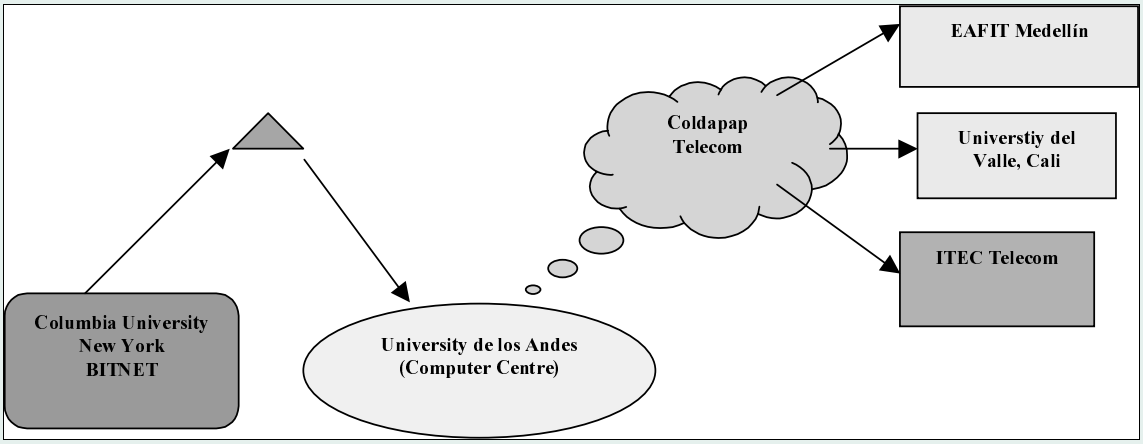
With the coming of the World Wide Web in 1994, new ISPs emerged, among them IMSAT, CABLENET and COLOMSAT, and started offering Internet connections on a regular commercial basis. In a market entirely open to competition and free from regulatory restrictions, these firms started offering a wide variety of services with different tariff plans.

At about the same time, in November 1993, the Colombian Information Technology and Telecommunications Association (CCIT) was established as a trade organization bringing together major private telecommunication and information-technology companies in the country. As of the beginning of 2000, CCIT had flourished with 38 affiliated companies, including telecommunication service operators as well as equipment and technology suppliers and consulting firms. Among its services, CCIT offers an up-to-date information service on rules and regulations governing this

field, on the nationwide infrastructure, and on the equipment suppliers operating in the country.

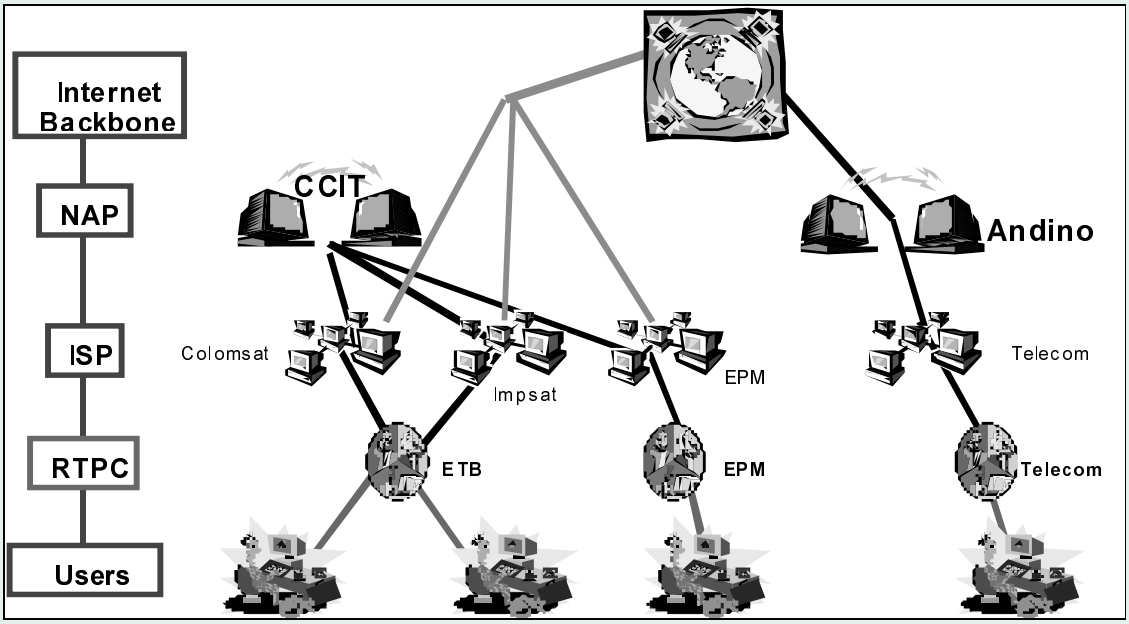
The emergence of CCIT generated certain other major initiatives in the sector, such as the establishment in early 1999 of the first Network Access Point (NAP)[27] in Colombia (see Figures 2 and 5), bringing together the country's largest Internet service providers (ISPs).[28] The purpose of the NAP is to channel and route communications exchanged between users on the various Internet access networks.[29] Since the NAP was implemented, it has offered equal conditions and opportunities to all operators linked to the it and information concerning traffic volume, speed, traffic ratio, utilization time, degree of congestion and other operational matters.

Figure 1: Connection to Bitnet



Source: Prepared by the author on the basis of interviews.

Figure 2: Internet connections in 1999 with NAPs



Source: CRT. Proposals for the Internet access rate scheme, 24 January 2000.

[21] Telecom is a corporation established in 1947, which held a monopoly on long-distance service until 1997.

[22] In the late 1980s, Telecom built the X.25 data network This was critical in connecting the Colombian universities to Bitnet.

[23] Panamsat offered a 50-per cent discount on the service cost for a 128-kbit connection in Homestead, Florida, which was in turn connected to NSFNET.

[24] An important feature in the development of the Internet in Colombia was the design and implementation of the internal network of the University of the Andes, using TCP/IP protocols. Once access to Bitnet was in place, this made it possible for coverage to be extended to both student and faculty alike, and created a ready-made pool of users for eventual connection to the Internet.

[25] CETCOL, which was established with the cooperation of Colciencias, ICFES and the main universities, was designed according to the NSF concept to promote the establishment of a database shared by universities. It was a pioneer in providing Internet access prior to the advent of commercial Internet service providers (ISPs).

[26] Before SAITEL was offered commercially to the public, it was a research division of ITEC. It had about a thousand users connected to the Internet, most of them companies or entities such as the *Federación Nacional de Cafeteros* (National Federation of Coffee Producers), and Ecopetrol (the Colombian Oil Corporation).

[27] Network Access Point: a junction point where major Internet service providers interconnect with each other. Also known as Internet Exchanges (IXs), connection at one or more of these NAPs means "connected to the Internet"

[28] These ISPs include Americatel Colombia, Andinet-on-Line, Colomsat S.A., Comsat, Corporación inter red, Emtelco S.A., Empresas Públicas de Medellín, Global One Communications, S.A., IBM de Colombia, S.A., Impsat S.A., Rey Moreno Ltda., Teleglobe Colombia S.A., Firstcom, and Diginet Colombia Ltda.

[29] Cisco Systems, Inc., donated the routing equipment for the connection of the first 16 ISPs connected to the NAP.

4. Profile of the Internet market

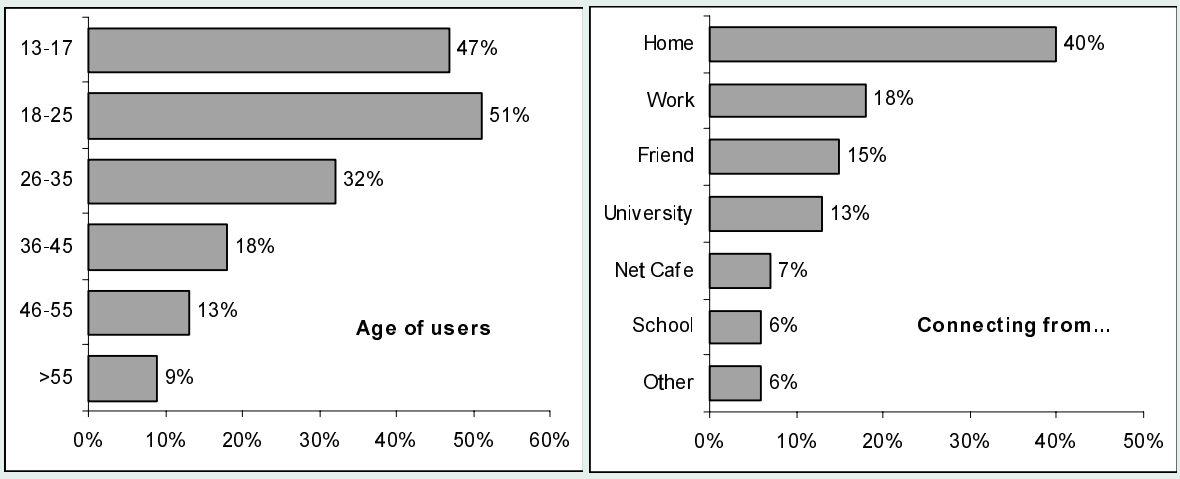
The number of Internet servers in Colombia stood in July 2000 at 44'413.[30] The number of Internet accounts has also grown at a steady pace. In December 2000, CRT carried out a survey that identified some 107'000 Internet dial-up accounts throughout the country. The survey did not include users in Bogota (estimated at some 100'000) nor did it include users of free Internet services or business accounts.[31] Hence, taking into consideration users in Bogota, those who access the Internet from cafes, or from universities, and those who have access through local networks in companies and organizations, and the booming growth of Internet usage in the educational institutions it is estimated that by early 2001 there were more than 1'000'000 regular Internet users in Colombia.[32]

According to a recent national survey[33], some 51 of the people between the age of 18 and 25 use the Internet regularly. Most of them access the Web from home. Some 15 per cent do it from the home of friends or family (See Figure 3). The great majority of Colombians on the Web are university students followed by professionals.

However, many users still have only limited access to PCs and modems and are, at present, unable to acquire their own due to the low level of the average income and the high cost of such equipment. The monthly minimum income per capita in 2000 was US$ 124 and the cost of purchasing a computer and a modem was approximately US$ 600, so purchasing the necessary equipment to access the Internet would require more than four

Figure 3: Young and home-based

Percentage of people surveyed that use the Internet in Colombia, (left-hand chart) and location from where they access the Internet (right-hand chart), September 2000.



Source: CINTEL <http://www.cintel.org.co/index.htm>.

times the minimum monthly income. In comparison, the cost of a television set is approximately US$ 100, which means that buying a television requires less than the average monthly income.[34] This means that the growth of the PC market has been rather slow. In 1998 there were 249'311 PCs in the country. Two years later the PC market had added only 13'289 reaching 262'600 personal computers. Consequently, it will be some years before Internet access is extended to the majority of Colombians. However, according the recent figures, the number of Internet hosts which combines the two digit country code, ".co" and the three digit generic Top Level Domain (gTLD) code (.com, .edu, etc) reached 77'910 in July 2000 (see Figure 4).

There is a considerable number of ISPs operating in the Colombian market. Of the 134 firms that hold a value-added licence issued by the Ministry of Communications, only the larger players like Telecom, Latinonet, Impsat, Cablenet, EPM, Telesat, Colomsat, Global One, Rey Moreno, and 54 others of various sizes, offer Internet connections. However, the bulk of market share in Colombia is divided between only a few of these ISPs (see Box 2).

As of early 2000, a wide variety of rate plans were to be found, starting at as little as three dollars for four hours a month. The rate for unlimited Internet access ranged between US$ 15 and US$ 40 per month, at speeds of 30 to 56.6 kbit/s. Cable television operators in Bogotá offered home Internet access in addition to the regular television service for US$ 34, plus US$ 60 per month for 300 MB. This price included a modem, installation and a network card. As of early 2000 some ISPs (such as <www.tutopia.com>; <www.gratis1.com> and ETB) started offering Internet connection free of charge.

The wide variety of ISPs has brought a great deal of competition and, consequently, a broad array of services, prices and promotions are being offered. Since January 2000, for example, one company has been offering Internet access free of charge, a development that will surely lead to significant changes in the pricing scheme currently in force in the market. Another company has been offering a computer with an Internet connection for US$ 50 per month under a locked-in three-year contract, and many firms are offering special rates for students.

Yet, aside from the benefits that competition will certainly bring, the reduction of rates for Internet services have been considerably improved by a recent CRT decision, which approved Resolution 307 and established a flat fee of US$ 9.50 for 90 hours of access to the Internet. Most ISPs are connected to basic local networks by means of switched lines or access connections, or by means of E1 lines leased under individual contracts, which are usually standard-clause contracts, established for any user. Thus, approximately 50 E1 lines account for the total transmission capacity of all Colombian ISPs having servers in the United States. Some ISPs, however, have the potential to expand that capacity immediately, among them Telecom and Global One. In 1999, IP connections grew by 250 per cent (20 per cent of the capacity is by fibre optics and 80 per cent by satellite).[35] The Maya cable brought further expansion in mid-2000 to the already available connectivity. According to some official estimates, as of late 2000, 80 per cent of the total capacity available in Colombia was being used.

Recent months have seen a spurt in the volume of Internet traffic originated by the ISPs linked to the NAP (Figure 5, left-hand chart). In the first nine months of 2000, traffic volumes tripled, from some 320 Mbit/s in January 2000 to 950 Mbit/s in September 2000.

Most of the rapidly growing traffic is linked to the various services offered by companies in the market, such as e-mail, Virtual Private Networks (VPNs), application hosting, content services, web browsing, distance learning and network management. However, recently there has been a significant change in traffic type. In

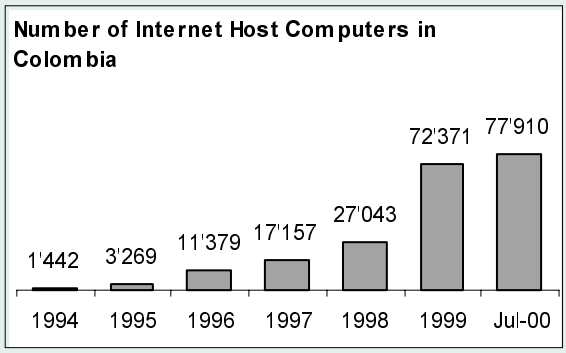
November 1999, e-mail took 46 per cent of the traffic while 39 per cent went to browsing; by September 2000 the situation has been reversed with 46 per cent of the traffic devoted to browsing and some 35 per cent geared towards e-mail (Figure 5, right-hand chart). At the end of 1999, the sites most often visited included banks, radio news programmes, a newspaper, the Ministry of Health, the Chamber of Commerce, a university and an airline.[36]

Most government agencies have created their own web pages, where they post information about their respective areas of responsibility. Prospects for increasing the scope of application of Internet services are excellent. In Bogotá, for instance, a network has been set up to connect institutions of learning, and it is hoped that by the end of 2001 they will all be connected to the Internet by means of a city-wide network. Some public utilities are now set up to accept requests and enquiries via the Internet. Another example, involves a procedure that the CRT has established for issuing regulatory documents and other materials.[37] A group of professors at the National University of Colombia is investigating possible applications in the field of medicine, and banks and businesses have already produced web applications and means of contact via the Internet. The newspaper El Tiempo has participated in the Grupo de Diarios América Project <http://www.gda.com> which operates an Internet portal geared to the Spanish and Portuguese language content market.

Contrasting with the rather restrictive approach that some sectors of the national administration have taken with the challenges posed by IP Telephony, the government has been strongly promoting the adoption of the Internet and its services both within the government and in civil society in general. The government launched, in early 2000, a program called, "Agenda Nacional de Conectividad: El S@alto al Internet" (The National Connectivity Agenda: the Jump to the Internet). The program provides clear guidelines and policies to promote the adoption of Internet services among various government agencies, and more generally by those institutions involved in the economic, social, and cultural life of the nation (see Box 3).

An important step to support the implementation of the Connectivity Agenda has been the approval of Resolution 307 by the CRT to introduce flat tariffs for Internet services and requires local access providers to charge a flat rate of US$ 9.50 for 90 hours a month of Internet access, instead of the US$ 54 that would have been charged for 90 hours if the rate was the standard charge for local calls.[38]

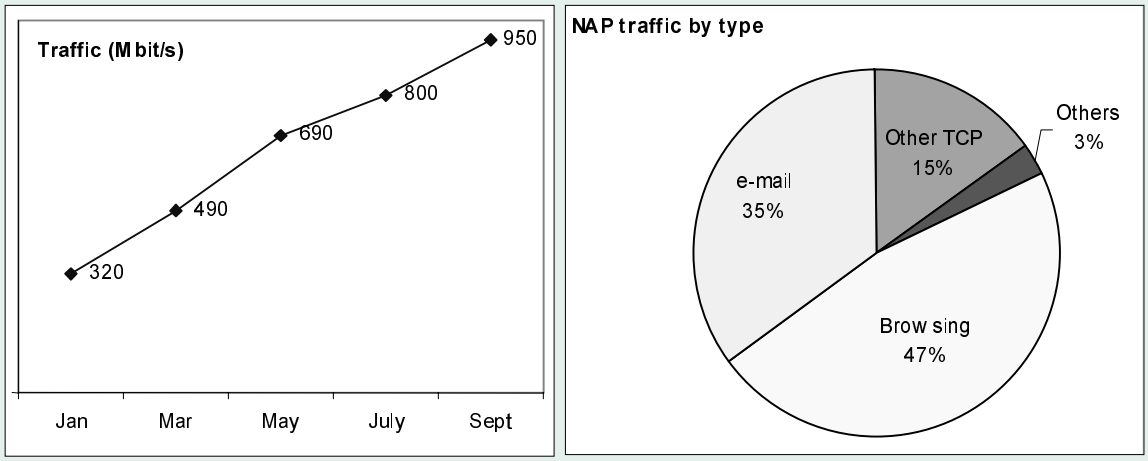
Figure 4: Host computers in Colombia



Source: ITU Internet reports: IP Telephony <http://www.itu.int/ti/publications/INET_00/index.htm> (partially based on data from the Internet Software Consortium <www.isc.org> and RIPE <www.ripe.net>).

Figure 5: Volume and type of NAP traffic

Growth of Internet traffic 2000 (right-hand chart) and traffic type (left-hand chart) recorded in the Colombian NAP (September 2000).



Source: Cámara Colombiana de Informática y Telecomunicaciones, NAP.

Box 2: Market leaders

The main Internet service providers in Colombia, 1999

Telecom: Telecom entered the Internet business in 1994, offering service by means of its digital microwave network to 1'000 users in Colombia's main cities. By the end of 1999, Telecom had 35'000 residential subscribers, representing a 35-fold increase in six years, and some 190 corporate subscribers.[39] By these figures, Telecom ranks as the country's largest ISP. Through its extensive IP network, Telecom offers Internet services in more than 35 cities in the country. Thanks to its national fibre optic network, the company is positioning itself as the most technically advanced ISP in Colombia. In 1998, it began offering high-speed broadband connections for residential and commercial subscribers using xDSL lines. It has plans to put a NAP into service, to be situated in Barranquilla at the landing point of the Pan American cable where it will be linked to Telecom's fibre network. This NAP will serve ISPs not only in Colombia, but also in Ecuador. Telecom also has a national SDH microwave network. It uses a 50-teleport DOMSAT satellite system as a back-up, and offers packet-connection services through ITEC, the arm of Telecom that is developing applications for distance education and other services.

Colomsat: Colomsat, which is part of the NAP operated by the CCIT, has been providing Internet access since 1995, offering dial-up access and dedicated connections by means of digital lines and ISDN connections for residential and commercial subscribers. At the end of 1999, it had over 20'000 subscribers. In 1998, with a view to strengthening its corporate customer base, Colomsat entered into an agreement with CompuServe to provide integrated Internet solutions for corporate users. Colomsat offers microwave connections and local last-mile connections by cable in Bogotá, and its customers in Cali and Medellín can access the service through ISDN lines. The company uses its microwave infrastructure for domestic Internet transmission and an international Texcom satellite access to Florida to connect to the Internet infrastructure of MCI, based on a frame relay platform. The company has also concluded contracts for other international connections to double its transmission capacity. Speeds range between 33.6 kbit/s for dial-up access to 64 kbit/s and above for high-speed access. Colomsat does not offer its own content, but it does have a web page that provides connections to a number of content and electronic-commerce sites.

ImpSat: ImpSat began operations in Colombia in 1996, and has become another of the country's main Internet service providers. It was bought in August 1999 by the pan-regional El Sitio portal. The firm is now conducting IP voice tests. ImpSat has operating nodes in Medellín and Bogotá, and is in the process of installing network nodes in Viejo Caldas and Barranquilla. The average Internet access speed is 33 kbit/s, and most clients are migrating to 56 kbit/s. ImpSat uses its own international link for its Internet infrastructure. It does not offer any content of its own in Colombia, but it does now form part of the network of El Sitio portals.[40]

ETB: The Empresa de Telecomunicaciones de Bogota (ETB) is a new but very dynamic and successful ISP that has grow quickly. One of the basis of the success of the company is a new and innovative program by which users can access Internet services without having to register with the company. In this way, ETB has attracted a large number of its traditional voice telephony clients.[41] Another of the reasons the company has lured a large number of customers is the fact that is the only company that has quickly implemented the flat fee requirement of the regulator.

Source: Telecom, Colomsat, ImpSat and ETB

Box 3: Connecting Colombians

The "Agenda Nacional de Conectividad: El S@alto al Internet" (the National Connectivity Agenda: the Jump to the Internet) was launched by the government in February 2000. The document lays out some clear objectives and strategies to promote the Internet in the country and to bring all Colombians closer to an informatized society. Some of the main objectives and strategies of the document are:

- Civil Society: Promote the use of Information and Communication Technology to offer equal access to education, jobs, justice, culture, and recreation, among others.
- Industry: Promote the use of Information and Communication Technology to support growth, competitiveness, access to markets, and the creation of jobs.
- The State: Provide the National Administration with the connectivity required to facilitate the administrative tasks of the state to serve the citizen.

The strategies of the Agenda are: 1) Access to information infrastructure; 2) Strengthen the national telecommunications infrastructure; 3) Provide access to information technology to the great majority of Colombians at reasonable prices; 4) Use of information technology in education and training students in the use of information technologies; 5) Strengthen human resources specialized in the development and maintenance of information and communication technologies; 6) Raise awareness of the population of the importance of the use of information technologies; 7) Improve the competitiveness of national companies through the adoption and use of information technologies; 8) Promote the growth of the national information and communications technologies industries; 9) Promote the national content industry; 10) Place the Colombian cultural heritage online; 11) Improve the functioning and efficiency of the State; 12) Increase transparency and accountancy of the national administration's procedures and practices; 13) Improve public services through the use of information technologies in government.

The strategies have been articulated into various programmes and projects under the leadership of various government institutions and agencies. The projects are centrally coordinated to guarantee the efficient use of human, technical and financial resources.

In summary, the entry into service of the NAP, the enacting of the law on electronic commerce, the promotion of initiatives to foster Internet access for less privileged members of society and the use of IT by companies and the State through policies outlined in the National Connectivity Agenda, and the increase in the installed capacity of the country's networks as a result of the long-distance service being opened to competition, have all been positive factors for the development of the Internet. On the other hand, and as is the case with many other countries, limited international connections, old analogue hardware in parts of the national network, regulatory problems as highlighted by the Comcel case (see section 6.2), and the difficulties in applying rules and regulations to value-added services, have hampered the rise of the Internet in Colombia.

[30] See Internet Software Consortium at <http://www.isc.org/ds/WWW-200007/dist-bynum.html>.

[31] A survey of CRT, "Propuestas al Esquema Tarifario de Acceso a Internet, Enero 24 de 2000" ["Internet access rate proposals, 24 January 2000"] at beginning of 2000 estimated some 380'000 dedicated and university users, 110'000 dial up users and 4'000 users connected by cable modem.

[32] IDC estimated some 735'000 users for 2000 and 1'517'000 for the year 2003.

[33] Centro de investigacion de las telecomunicaciones <http://www.cintel.org.co>.

[34] The density of television sets per 100 inhabitants is a better indicator, which suggests that a Web-TV system could gain acceptance in Colombia. Even though, with nearly 22 television sets for every 100 inhabitants, Colombia ranks 98th among countries worldwide, it ranks close to its Latin American neighbours. On the other hand, it does indeed fall behind in comparison with the most developed countries, which in every case have more than 45 television sets per 100 inhabitants.

[35] "Los servicios de Internet en Colombia" [Internet services in Colombia], R. Lievano, Adviser to the General Coordinator of CRT. Paper given in La Jolla, California, on 9 November 1999.

[36] See <http://www.nap.com.co>.

[37] See Part VIII, Chapter IV, Article 8.40 of Resolution 87 of 1997, which can be consulted online at <http://www.crt.gov.co>.

[38] For more details see <http://web.crt.gov.co/Normatividad/normatividad_1.php3>.

[39] According to information provided by the ITEC research division.

[40] Another major provider is Global One, inasmuch as it administers the end cable television connection which offers not only cable television reception but also Internet connectivity.

[41] The company had over 2 million clients in late 2000.

5. Legislation and regulations related to the Internet

In 1999, the National Government transferred most regulatory functions for telecommunication services from the Ministry of Communications to the CRT.[42] However, a recent decision of the Constitutional Court of Colombia[43] clarified the scope of the functions of CRT.

The court argued that: "It should further be noted that neither the President's legal entitlement to delegate nor the fact that the President actually delegates can be taken to imply a regulatory competence or capacity on the part of the commissions that can be on a par with the law or in competition with it, or the power to establish regulations under the laws on public services, this being the exclusive prerogative of the President of the Republic under the terms of No. 11 of Article 189 of the Constitution, and as such not open to delegation. Thus, the regulatory acts established by the commissions are, in their totality, subject to the law, to the regulatory decrees issued by the President and to the policies established by the National Government in the respective sphere. Moreover, as the commissions are answerable to the Ministries of Economic Development, Mines and Energy and Communications, it is clear that they are each, in accordance with the foregoing, subject to the guidelines and policies issued by the respective minister, since, as provided by Article 208 of the Constitution, the ministers shall act as administrative chiefs of their respective departments. At the same time, it is to be reiterated that, in accordance with Article 189 of the Constitution, the President of the Republic is the supreme administrative authority."

While responsible for regulating telecommunication services, the Ministry had not taken any kind of specific regulatory action in this regard. In fact from, the national policy standpoint, the Ministry announced officially that it would not regulate the Internet.

Although this has not been explicitly stated in any rule or regulation, it appears that Internet access is being considered by the country's telecommunication authorities as a service that should be made available to the entire population, falling in this way within the framework of universal-access programmes.

The rules for opening long-distance service to competition, which were implemented in September 1997, required long-distance operators to establish integrated social telephony centres (CITS). The Compartel II plan, the programme recently launched by the *Fondo Nacional de Comunicaciones* (National Communications Fund) with the aim of providing low cost communication services, also aims to establish over 80 centres similar to those provided for under the rules for long-distance operators.[44] Furthermore, in January 2000, the CRT, taking a rather proactive approach to the development of the Internet, prepared a full report on an appropriate rate structure to promote the Internet.

In a complementary action, the National Congress took its first action to clarify regulatory matters in the area of electronic commerce by enacting Law 527 of 1999. In this Law, provisions have been made and regulations laid down with respect to the use of electronic communications, covering electronic commerce, the use of electronic signatures, and provisions for the creation of certification bodies (see Box 4).

Subsequently, at the end of October 1999, a public charge was brought against Law 527 by the representative of the *Colegio Colombiano de Abogados Notarios,* the Colombian College of

Notaries, who claimed that the law was unconstitutional. The grounds of this complaint were that the law gave the certification bodies (natural or corporate persons), and the Chamber of Commerce, the power to attest to authenticity, whereas this was a function properly reserved to notaries. The charge also stated that in Colombia, not only did the Constitution provide for public attestation to be a public service, but it also provided that it was a function reserved to notaries, and hence all documents were the fundamental, principal and final purpose of the notarial profession. Consequently, there was a need to update provisions regarding such mechanisms as electronic signatures so such services could be provided by notaries. The plaintiff also considered that there was no justification for transferring the supervision of international attestations of authenticity done by notaries and notary functions to a Superintendent other than the Superintendent responsible for notary and registration functions. Several rulings and legislation issued between 1999 and 2000 has partially given the reason to the notaries and have set them as certification authorities.[45]

Box 4: Changing the rules of the game

Law 527 of 1999 lays out principles with respect to the admissibility and legal force of electronic communications, such as the presumption that when such a communication can subsequently be retrieved for purposes of consultation, this will satisfy the requirement that the communication in question be set forth in writing. It is also made clear that an electronic communication is deemed a document and is presumed genuine on the affirmation of the person who prepared, wrote or signed it. It is in this respect that the certification bodies take on special importance, and pursuant to the law, they must be authorized by the *Superintendencia de Industria y Comercio*. These bodies may be public or private corporate entities, whether domestic or foreign, or chambers of commerce. From this, it can be seen that a contract remains valid and binding even if one or more electronic communications were used to conclude it. Finally, the law establishes clearly that consumer rights must not in any way be impaired; and it provides an appropriate period (12 months) for the *Superintendencia de Industria y Comercio* to make the necessary organizational provisions in order to discharge the responsibilities assigned to it. Under the law, electronic communications are accepted as authoritative under the Code of Civil Procedure, and an electronic signature has the same force and effect as a handwritten signature.

[42] See Regular Decree 1130 of 1999 for provisions established at the time of ministerial restructuring.

[43] *Corte Constitucional de Colombia*; Sentencia C 1162 2000.

[44] CRT Resolutions 86 and 87 govern the opening of the market. Resolution 86 (Articles 26 and 27) provides that long-distance operators are required to build and operate "centros integrados de telefonía social" (CITSs) offering the following services as a minimum: (a) automatic domestic and international long distance service, which must be made available to the entire community and be able to serve at least five users simultaneously, with access to the public switched telephone network (PSTN); (b) two computer terminals with Internet connections, which permit direct access to the Internet and provide electronic mail services, with individual mailboxes made available for distributing electronic mail to the community, and with the student population being given priority for their use; and (c) two fax machines providing the community with direct access to this service, with the student population being given priority for their use. The CITSs are to be located preferably in public educational institutions, and must be accessible to the community on a continuous basis. For more details on the Compartel plan, see the website <http://www.compartel.gov.co>.

[45] Some of the legislation concerned are Law 588 of 2000; as well as Decree 1747 and Resolution 26930 issued by the Superintendencia de Industry y Comercio regulating aspects of Law 527 of 1999.

6. IP Telephony in Colombia

In various sectors of the economy, the Internet is seen as necessary for the development of modern society and very important for economic development. However, most telecommunication operators in Colombia had not been thinking seriously until recently of using Internet technology to offer their services. The first and only case until early 2000 concerned a cellular phone company (Comcel, see section 6.2), which was unable to continue offering long-distance IP services because they were being offered in violation of existing laws and regulations.

In local telephony, which is completely open and where there are no regulatory restrictions, there is no evidence at all of any initiative on the part of these operators to offer IP Telephony.[46] The largest cable television service provider in Bogotá—Tvcable—with more than 200'000 subscribers and a cable network installed throughout much of the city, obtained numbering assignment by the CRT to start providing local telephony, but as of early 2001 the company had still not launched such services. Their forthcoming service packages will include television service, Internet service, and basic telephone service. Another company that could easily get into the local IP Telephony market is Firstcom, a former subsidiary of Telecom, and recently acquired by AT&T. The company has a good infrastructure in Bogotá and other cities throughout Colombia.

In long-distance, Orbitel recently began testing a voice communication service that provides a connection to the operator from a computer, using Ericsson software. ETB hopes to be able to offer long-distance IP service this year, but has no plans for local service. Telecom appears to be planning to offer IP voice services during 2001 at lower cost.

Value-added companies have very good prospects of getting into the local IP Telephony business, since they know the business, they have the equipment, and have operating structure in place. There are, however, strong constraints imposed on operators because of the cost of long-distance service licences (US$ 150 million) and those companies that have already paid for such a licence are pressing to keep the market closed to new entrants. Hence, it will be difficult to open up the long-distance market entirely unless some significant regulatory reforms are carried forward.

[46] Even in Compartel I, the programme recently launched by the *Fondo Nacional de Comunicaciones* (National Communications Fund) with the aim of providing low cost communication services IP services have not been considered at all. In Compartel II, a move towards the Internet services is expected.

7. Legal aspects of Internet voice service

It has been recognized since the advent of Internet access in 1994 that value-added service operators are legally authorized to permit access to the network and that such operators may connect to local networks by means of switched access or any other interconnection provided that it is acceptable to the interconnecting operators. Value-added operators may also build and operate their own bearer or transport networks, if they have the proper licence. These general principles were set forth at the beginning of the 1990s by Decree-Law 1900 that was later regulated by Regulatory Decree 1794 of 1991 (see Table 5). [47]

Colombia's new Constitution[48], which came into force in 1991, established that, while public services are inherent to the social aims of the State, private providers may still supply these services. This had not been explicitly stated before. Pursuant to the Constitution, Law 142, better known as the Law on Public Utilities was enacted in 1994. In addition to creating the CRT with a view to promoting competition in basic local telephone services, this law required the long-distance service be opened to competition, established that companies could freely enter the market for local telephone services, and set out the principles governing such services. This Law also created the Superintendencia de Servicios Públicos Domiciliarios, the Office of the Superintendent of Public Utilities, and established it as the agency responsible for monitoring and over-seeing telecommunication, water, electricity, sewerage and gas services. The enacting of this Law, in 1994, coincided with the arrival of the Internet in Colombia.

It was not until 1997 that the CRT, after a lengthy reform process, managed to open the market by issuing Resolutions 86 and 87 of 1997. Although those Resolutions did not contain any specific provisions with respect to the Internet, they did set a price of US$ 150 million for licences for new long-distance operators. Taken together, this fact and the existing provisions have caused problems in the overall regulatory structure, particularly in regard to the desired atmosphere of liberalization for promoting the use of the Internet and its applications.

7.1 Long-distance operators and value-added operators

Without a doubt, value-added operators can offer more services nowadays through the Internet than those referred to (in a non-exclusive listing) in Decree-Law 1900 of 1990.[49] In the early licences, there is tacit acceptance of value-added operators being able to handle voice traffic, if they do so under special conditions. The CRT and the Ministry of Communications have just made their official decision public in this matter, by means of an opinion (see Box 7) and Resolution 70/00, whereby the Comcel case was resolved.

Rapid technological innovations and the convergence of technologies and services have posed significant challenges to the existing regulatory frameworks in most countries. Colombia has been no exception in that regard, and a number of value-added operators in the country became increasingly involved in the transmission of voice over data networks.

Several of these operators have been affected recently by the actions taken by the Fiscalía, the Office of the Public Prosecutor, at the end of 1999, which started investigating at least 20 of them on the basis of accusations made by Telecom, ETB and Orbitel that they were transmitting voice over their networks.

Table 5: Defining telecommunication services

	Services	Definition	Criteria for the granting of telecommunication service concessions
Basic	Carrier services	Those services which supply the necessary capacity for the transmission of signals between two or more specified points in the telecommunication network. They include those services that are provided over circuit-switching or packet switching networks and those that are provided over non-switched networks. Examples of such services are those for the leasing of insulated pairs and of dedicated circuits.	May be granted to duly constituted specialized companies. Holders of concessions for basic services may not provide telematic or value-added services unless they hold the corresponding licence. Concession contracts for telecommunication services covering the operation and exploitation of the different types of basic service and of indirect broadcasting services are administrative contracts governed by the provisions of Decree Law 222 of 1983, or by any provisions that replace, modify or amplify it, or by the present Decree.
	Teleservices	Those services which in themselves provide the full capacity for communication between users, including terminal equipment functions. Such services include telephony (fixed, mobile and cellular mobile), telegraphy and telex.	
Broadcasting services		Those services in which communication is effected simultaneously and in one direction to various points of reception. Such services include sound and television broadcasting.	Through direct contracting, with the proviso indicated in the following article.
Telematic services		Those services which, using basic services as their support, provide for the exchange of information between terminals with established protocols for open interconnection systems. Such services include telefax, publifax, teletext, videotex and datafax.	Granted by means of a licence, within a framework of free competition, for both the national and international services.
Value-added services		Those services which, using basic, telematic or broadcasting services, or any combination thereof, provide full capacity for the transmission or exchange of information and which add additional facilities to the support service or satisfy specific new telecommunication requirements. Such services include the accessing, transmission, processing, delivery and recovery of stored information, electronic fund transfer, videotext, teletext and e-mail. Only those services that can be differentiated from basic services may be considered value-added services.	

(continued)

Table 5 *(continued)*

Auxiliary assistance services	Telecommunication services that are linked to other public services for the purpose of ensuring the safety of human life, State security or for humanitarian purposes. Such services include radio services for distress and the safety of human life, and to assist in meteorological provision and aeronautical or maritime navigation.	Granted by means of a licence.
Special services	Those services intended to satisfy, without any kind of profit or business motive, needs of a cultural or scientific nature. Such services include the amateur service, experimental services and services relating to industrial, scientific and technical research.	

Source: Decree 1900 of 1990.

Apparently, in 1999 there was a considerable amount of traffic being routed in the form of data over IP networks, because the three long-distance operators—namely Telecom, ETB and Orbitel—saw their traffic increase considerably after the Public Prosecutor started investigating the value-added operators, and according to unconfirmed reports, traffic to and from the United States increased by as much as 50 per cent.[50]

Countries, such as Argentina and Colombia (whose settlement rates with the United States on 1 March 2000 stood at 27 and 32.5 US cents per minute respectively), have been 'punished' by US carriers that have routed increasing volumes of traffic to those countries via refile or routes which bypass the accounting rate mechanism, such as the Internet (see Figure 6). In the case of Argentina, the estimated bypass traffic was almost equal to the total reported volume of traffic on the route to the United States in 1998 (i.e., just over 200 million minutes). In the case of Colombia, where call-turnaround was historically less significant, estimated bypass traffic amounts to around 160 million minutes. At the level of settlement rates that prevailed in 1998, the losses incurred by Argentina and Colombia from bypass traffic were over US$ 60 million for each country.

In the process of opening the Colombian market to competition, telecommunication legislation has become very complex. In the course of this process, penalties including imprisonment could be imposed for failure to abide by telecommunication rules and regulations. Law 422 of 1998, for example, states in Article 6: "Anyone who accesses or uses the cellular mobile telephone service or any other telecommunication service by means of the unauthorized copying or reproduction of signals which identify terminal equipment for such services, or taps, or use of unauthorized lines of the local switched basic public telephone service, extended local service, or long-distance service, or who provides or engages in unauthorized telecommunication services or activities for profit shall be subject to imprisonment for a period of four to ten years and a fine of from 500 times to 1'000 times the monthly minimum wage established by law."

The Constitutional Court of Colombia, one of the highest courts in the Colombian judicial system, issued in 2000 a decision that the extension to "or any other telecommunication service" was unconstitutional and, therefore, invalidated the basis under which the penal prosecution against the value-added operators and Comcel had been carried out.[51] This, however, does not invalidate the administrative process carried out against both Comcel and value-added operators.[52]

These regulatory and legal complexities can be exacerbated by technology. To take the case quoted above, when an operator is in a position in which it is practically impossible to control or stop the service: How can an operator tell the difference between Internet traffic originating by means of web-to-phone software and traffic originating at a telephone on the basic switched network? The question then arises as to whether hardware or software is available that the operator can use to filter communications transmitted on its network in order to ensure that it is not providing the unauthorized service and, if such hardware or software does exist, whether it is logical to force the operator to buy it or to force the user to deprive himself of the service. Whether regulation focuses on how the Internet is used or on the user's experience, the outcome is the same.

It is important to recognize that all voice services offered over the Internet are liberalized. Voice over the Internet is not subject to any regulatory restriction of any kind if it is provided from or to a computer.[53] On the other hand, existing provisions establish regulatory barriers which restrict access to international long-distance voice services via the Internet when such service is offered to or from a cellular telephone by operators other than those authorized to provide international long-distance service[54] or when the communication originates and terminates at a telephone.[55] This does not imply that authorized operators have any restriction on using IP technology or any other technology of their choosing in their services or networks. It is government policy to promote the Internet, as set forth in the National Connectivity Agenda, and clear activities in support of this are envisaged, such as considering Internet access to form part of the universal service.

As Internet coverage and access are broadened, there are ever more opportunities to use the Internet to offer voice services. The fact that all Colombian ISPs can be accessed from the United States means that the free calls offered via the Internet in the United States, or via toll-free "1 800" numbers, can also be offered from Colombia.[56]

It is very difficult, if not impossible, to maintain the regulatory structure that has existed in the past without taking into account the rapid technological change that the industry is experiencing. To what extent can services which are perceived by the user to be the same, be defined in the rules and regulations as being different?

7.2 The case of Comcel

In late 1998, Comcel, one of the operators holding a cellular mobile telephone service licence, concluded a contract with another value-added operator to offer a voice service via the Internet, which in the view of many in the telecommunication sector, was illegal.[57] The companies that had just received licences to provide long-distance services, for which they had paid US$ 150 million each, immediately raised formal complaints on the legality of the service offered by Comcel. The national administration subsequently launched four investigations.

The conflict erupted at the end of 1998 when Comcel published on 20 December 1998 in El Tiempo, one of the country's leading newspapers, an advertisement announcing that it was going to offer to its more than 500'000 customers a new service based on IP Telephony. The advertisement stated:

"Exclusively for Comcel users. Now it costs less to phone anywhere in the world with your Comcel cell phone than from a regular telephone. Using your Comcel cell phone you can call anywhere in the world and talk for just 770 pesos a minute (plus VAT) all inclusive, any time, any day. Just dial #124 + country code + area code + telephone number + Send."[58]

Orbitel, ETB the new long-distance operators and Telecom, immediately accused Comcel of operating in breach of telecommunication rules and regulations.

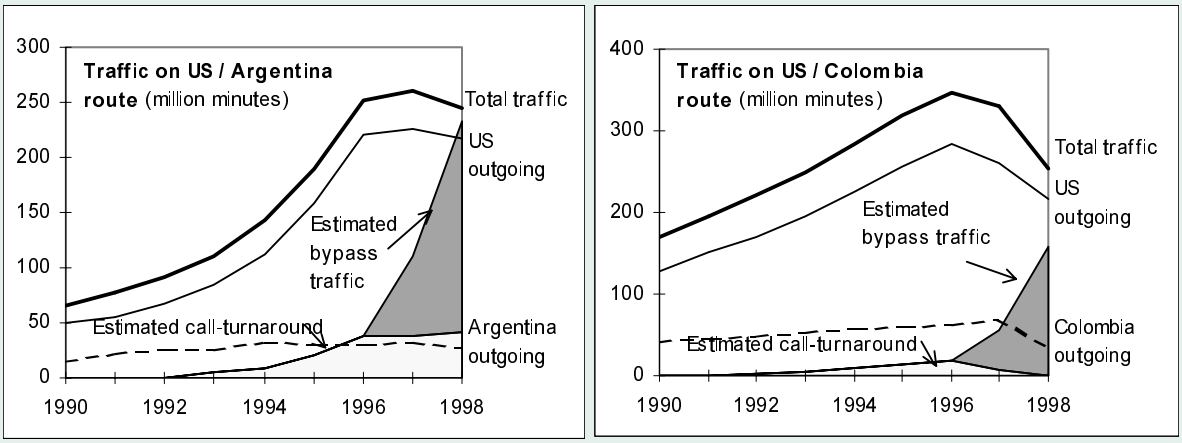
The next day, the CRT issued two Resolutions:

- The first established that all companies other than basic service providers that provided telephony services or were preparing to provide telephony services, regardless of the technology used, were brought under the regulatory function of the CRT and the oversight of the Office of the Superintendent of Public Utilities (SSP).
- The second ordered that an administrative investigation be started against Comcel to determine whether the service being offered by that firm could constitute unfair competition or lead to a reduction of competition between public telecommunication service companies.[59]

The Ministry of Communications also opened a preliminary investigation on 22 December 1998 (See Table 6). Its purpose was to determine whether there were grounds for Comcel being considered in breach of the telecommunication rules and regulations, and in particular in breach of the system for licensing the mobile cellular telephone service, by providing IP voice service for long-distance communications.

Figure 6: Bypassing the incumbents

Traffic balance on routes between US and Argentina and between US and Colombia, including estimates of call-turnaround and bypass traffic.



Note: "Estimated call-turnaround" traffic is the volume of traffic on a particular route that has been re-routed so that it appears that it is coming from the United States. This includes call-back, calling card and home-country direct traffic. It is estimated by applying the ratio between incoming and outgoing traffic that applied before 1992 to the subsequent traffic balance. "Estimated bypass traffic" is the volume of traffic on a particular route which is estimated to be rerouted via a least cost route (e.g., refile) or outside the accounting rate mechanism (e.g., via the Internet) such that it is not reported in official traffic statistics. It is estimated by comparing the projected growth in the total volume of traffic on the route, based on trends before 1996, with what actually happened after that date.

Source: ITU estimates. ITU/TeleGeography Inc. "Direction of Traffic" Database.

Box 5: Setting boundaries

Opinion by the CRT on the classification of value-added services.

CCIT question: " A particular telecommunication service can be described as operating as follows: A company outside the country receives a voice communication from the local switched public telephone network and puts it through technical coding, packing and routing procedures, and then delivers it to another company, in Colombia, which provides value-added services. The second company puts the communication through the reverse process, unpacking and decoding it and routing it so that it will be delivered as a voice communication once again on the local switched basic public telephone network of another operator. Following on from your previous responses, we would like to know whether the service just described can be considered a value-added service, or whether it is a switched long-distance basic public telephone service."

CRT answer: "As the question is put, and in keeping with the views expressed, we believe that the service described cannot be considered to be a value-added service distinguishable from basic international switched public telephone service. The reason is very simple. Even though there may be a connection between the networks of the value-added service in Colombia and switched public telephone networks, and even though the latter may be used as means of access or termination for communications sent to or from the authorized value-added network, whether in Colombia or abroad, as provided for by Articles 5 and 11 of Regulatory Decree 1794 of 1991, it is also clear that the value-added service, in so far as it involves the full capacity to convey a communication—that is, from one end to the other of a communication between user premises or terminals—must of necessity have distinguishing characteristics throughout the entire telecommunication transmission path."

Source: "Concepto sobre criterios diferenciales de los servicios de valor agregado", 19 January 2000. (CRT opinion on value-added services.)

The third one was carried out by the Office of the Superintendent for Trade and Industry (SIC). This process was concluded with penalties on Comcel for unfair competition imposing a sanction of US$ 230'000 (equivalent to 2'000 monthly minimum wages). Furthermore, long-distance operators presented a claim of US$ 54 million for the damages generated by the conduct of the IP Telephony Service Provider. Comcel, in its defence, challenged[60] the Superintendent of Industry and Commerce for having a family relation with the head of one of the long-distance carriers (ETB). The Ministry of Economic Development, which deals with such challenges, rejected the challenge in January 2001, which presumably opened the way to the demand for damages, which had been awaiting the resolution of the Ministry. But, in January 2001 also a new Law was passed in Congress trimming the mandate and powers of the Superintendencia de Industria y Comercio (SIC), including its ability to resolve matters such as the demand presented by the long-distance operators. Under the new legal scenario ETB, Orbitel and Telecom would have to submit their demand for damages to the judicial system of the country.[61]

Once the Ministry of Communications concluded its investigation in February 1999, *Fiscalia de la Nacion* (Office of the Public Prosecutor) launched an investigation into Comcel. This process was closed in October 1999 when the Constitutional Court of Colombia issued its decision that Article 6 of Law 422, that penalized those providing telecommunication services without a licence, was unconstitutional.

While from the standpoint of the relevant regulations and authorities, Comcel may have been in breach of rules governing the provision of services in the telecommunication sector, from the standpoint of the user, Comcel offered inexpensive international calls to any other telephone located anywhere in the world. Furthermore, the quality of the service, which often undermines IP Telephony services to the public, seemed to be quite reasonable.[62]

The arguments presented by Comcel, Occel and Rey Moreno to defend their service were oriented towards demonstrating that Rey Moreno was providing its service to a specific group of users of the basic Comcel and Occel support service, and that Rey Moreno was

adding value. The communications in question were neither basic switched international long-distance telephony nor cellular mobile telephony (for a technical description of how the service was carried out, see Box 6). Accordingly, the provisions requiring long-distance communications to be handled through licensed operators did not apply.

The curious point about Comcel's activities is that it is a major, well-organized cellular provider. With over 26 per cent of the country's cellular-telephone market, it is ranked among the top companies in the country, and it is in a good position to compete and expand its presence in the market.[63]

Another important and interesting aspect in this whole process is that two of the long-distance operators are major shareholders of Comcel. In 1998, when the company launched its IP Telephony service, ETB and Telecom—two of the long-distance carriers affected by the service—owned together at that time 39 per cent of Comcel. The remainder was owned by Bell Canada (60 per cent) and public service companies of Bucaramanga, Telehuila and other telcos and pension funds (1 per cent).[64] Through their participation in Comcel both ETB and Telecom tried to block the IP Telephony initiative and attempted in vain to fire the CEO of the company.

Why then would such a company decide to offer a service that would cause it such great problems? The most reasonable explanations revolve around the notions that Comcel managers:

- were sure that they could provide IP Telephony services and were empowered to do so under the existing rules and regulations;
- were not satisfied with the original conditions of their licence, and believed that the lack of regulatory clarity gave them good reason to take risks and press for regulatory change[65];
- believed that offering IP Telephony service through their network was an effective way to compete and to open new horizons in the market, while the legal risk of doing it was very low and could justify the decision to offer the service.

Indeed, the regulations in place include two important distorting factors, and taken together they make for a competitive environment, which has certain deficiencies. For example:

- cellular service operators are required to use legally established operators and do not receive any compensation for initiating or completing an international long-distance call through the companies that hold long-distance licences[66];
- billing is based on the "calling party pays" principle.

For these reasons, the cellular companies had in various ways restricted long-distance service from cellular telephones. Not all users can access domestic or international long-distance service. In the case of Comcel, only 3 to 5 per cent[67] of its subscribers have the service because subscribers must make a separate application for it, must demonstrate their ability to pay and must complete other procedures that makes it cumbersome and difficult to obtain the service.

When Comcel started offering its new service in December 1998, this coincided with the start of operations of the new companies that had obtained their long-distance licences a year earlier. Both the new long-distance operators and the established provider did a great deal of advertising suggesting that international long-distance charges were falling, and this caused an increase in the amount of traffic on cellular networks connecting to long-distance services. This brought about an increase in the amount of long-distance traffic being carried on cellular services, yet without the cellular services receiving any compensation for it. This distortion altered the structure of the cellular companies' revenues and expenses.

If one analyses the telecommunication services price structure, the prices offered by the #124 service would not

make the cellular user a clear winner, since most of the traffic is to the United States, and the promotional rates to that country offered by the new long-distance operators were lower and with a much higher level of quality than those offered by Comcel's IP Telephony service.

Generally speaking, the new service seemed to be aimed at broadening the alternatives available to cellular users and serving a market artificially closed by the same operator. This is borne out by the traffic volumes that the #124 service attracted in December 1998[68], when calling demand was high because of the holidays. Perhaps the appeal to a cellular user is being able to access the long-distance service from his automobile or when he is on the move. Comcel's IP Telephony service was offered for more than nine months, until the value-added company decided to suspend it. The company was taken over in the first half of 1999, and this could be a determining factor in the decision to suspend the service, alongside the pressure of government investigations.

The most important issue related to the introduction of this new service is that it gave a clear signal of the change in the structure of telecommunication services that was forthcoming thanks to the advent of the Internet, and particularly the need for the regulatory structure to evolve, accepting this new world and keeping pace with its development.

This situation led to great concern on the part of the CRT, and consideration is being given to courses of action which would lead to removing regulatory barriers without creating alarm amongst operators and other players. What is clear from the government's standpoint is that it believes in the importance of promoting the development and implementation of new uses of the Internet as they arise.

During preparation of the present report, the Ministry of Communications and the Superintendent for Trade and Industry wound up their administrative investigations. The Ministry imposed penalties on the three operators Comcel, Occel and Rey Moreno (see Box 7). The decision was appealed by Comcel and confirmed by Resolution 984 of 8 May 2000. The Superintendent's decision to fine Comcel and allow damage claims by the long-distance operators has been appealed. (See Table 6.)

Table 6: Judged by all camps

Summary of the various administrative and criminal processes generated by the presumed illegality of Comcel services.

20 December 1998, Comcel launches voice over IP services to call anywhere in the world at a fixed price.

CRT (*Comisión de Regulación de Telecomunicaciones*)		**Mincom *(Ministry of Communications)***		**SIC (*Superintendencia de Industria y Comercio)***		**Fiscalía (*Office of the Public Prosecutor*)**
Dec. 1998	Start of investigation (Res 132).	Dec. 1998	Start of investigation. Res. 70 00.	Dec. 1998	Start of investigation.	Further to the investigation of several value-added operators and to this case, legal action was taken against Comcel in 1999.
June 2000	Administrative action terminated owing to there being no further grounds for jurisdiction (Res. 271 and 272).	Feb. 2000	Breach of the telecommunication rules and regulations. Penalty imposed on the three companies Comcel, Occel and Rey Moreno.	Mar. 2000	Penalties imposed on Comcel for unfair competition and diversion of customers. Res. 4954 00.	
June 2000	Appeals by Orbitel and ETB.	May 2000	Res. 70 00 upheld, but breach of rules and regulations modified and penalty reduced. Res. 984 00	June 2000	Res. 4954 upheld. Res. 12835.	
Current situation: Appeals by long-distance operators against CRT Resolutions 271 and 272 pending.		*Current situation:* 1. In the view of the Ministry case is resolved; 2. Comcel brought an action before the *Tribunal Contencioso Administrativo* (TCA) (administrative disputes tribunal) for infringement of equal rights, ignorance of due process, etc.		*Current situation:* Comcel: 1. Took SIC to court in defence of its fundamental rights, contesting SIC's non-acceptance of the appeals; 2. Brought a remedy of complaint before the court of Cundinamarca; 3. Challenged the Superintendent on the grounds of having family connections with the mayor.		*Current situation:* Conclusion in second instance, on 31 October 2000, in favour of Comcel.
Future actions: A definitive end to the action. The service has already been deemed illegal and is not being provided. No actions or damages are expected, although the appeals are still pending.		*Future actions:* 2 TCA allowed the action. The final judgement could take three to four years. An appeal before the Council of State could take a further two to three years.		*Future actions:* 1. The defence of fundamental rights case appears to have been concluded in Comcel's disfavour; 2. Long-distance operators claiming damages amounting to US$ 54 million. SIC is expected to rule on the matter during the first half of 2001; 3. Passed over to the office of the Minister of Development for a decision.		*Future actions:* Case resolved.

Source: Case study author.

Box 6: Convergence in action

Technical aspects of the provision of international IP voice service from Comcel's cellular service.

From the standpoint of the user: (a) A user who is a subscriber to the service dials on his cellular telephone #124 + country code + area code + telephone number + Send. (b) The user hears a recorded message that says, "Welcome to Comcel 124. The cost of this service is 770 pesos plus VAT. Your transmission is being processed." (c) Following the recorded message, after a wait of about 20 seconds, s/he hears a ringing tone to indicate that the dialled number is ringing. (d) The called party answers, and the communication begins, continuing until one of the two parties ends the call. (e) The voice delay perceived by the parties during the communication is similar to the delay experienced in a conversation carried by a geostationary satellite link.

From the standpoint of the Comcel cellular network: (a) The user dials on his cellular telephone #124 + country code + area code + telephone number + Send. (b) The signalling reaches the current call meter (CCM) on the control channel, the cellular handset is validated on the network, the user takes a voice channel and the call is processed. (c) The CCM filters out all dialled numbers of fewer than 13 digits or more than 18 digits, as well as all calls which immediately after the #124 include 57 (for Colombia) or the numbers 0 to 11 (which are country codes not used). Calls filtered out in this way are routed to a recorded message which advises the caller that an error has been made in dialling. (d) Calls not filtered out are routed to a recorded message that says, "Welcome to Comcel 124. The cost of this service is 770 pesos plus VAT. Your transmission is being processed." The calls are then sent to one of Rey Moreno's trunk lines and delivered by means of two E1 satellites with Colombian R2 signalling without being sent to ANI (Automatic Number Identification) (although they could be sent to ANI if the called party were to request it). For the number of the called party, the entire number dialled by the cellular user is sent, except for the initial character #. (e) When the called party answers, an answering signal is sent on R2 to the CCM from Rey Moreno. (f) The call is over when one of the two parties ends the communication, freeing the voice channel. (g) Each call generates its corresponding record of charges at the CCM, which is processed in Comcel's billing system.

From the standpoint of the value-added service operator: (a) The value-added service operator receives a call on its two E1s coming from Comcel, with the corresponding signalling on R2 indicating 124 plus the international telephone number. (b) When it reaches an MMCS switch, it is routed by an outgoing E1 trunk line and the signalling is converted to R2 international. (c) From the switch, the voice passes to an NKO-MiniPOP device, where it is compressed, packed, and converted to IP protocol, together with its signalling. (d) The information is sent by means of an IP session to the correspondent in the United States by means of a 640 kbit/s satellite link leased from Intelsat, and the correspondent in turn delivers it to its destination by means of a direct or indirect connection to the international telephone network. The IP address used by Rey Moreno is 10.10.3.1, which belongs to an intranet and does not have an assigned Internet address. (e) The MMCS system has the ability to charge for and differentiate between services using the first digits of the number it receives. (f) When the communication is ended by one of the parties, the session is ended and the links are freed at both ends.

Source: Dossier of the Comcel case, Telecommunication Regulatory Commission (CRT), Colombia.

[47] Decree 1900 of 1990, which has the validity of a law as it was issued pursuant to the special powers given by the Congress to the President.

[48] This did not amend Decree 1900 of 1990.

[49] According to Article 31 of the Decree-Law, "These services consist, *inter alia*, of the accessing, sending, handling, storage and retrieval of information, electronic fund transfer, videotext, teletext and electronic mail."

[50] One problem for the regulatory authorities is the lack of reliable information, particularly in regard to long-distance traffic. Initially Telecom considered this information confidential, and this has made it difficult to obtain historical series that would provide accurate and reliable data, and hence valid studies. Responsibility in this area has subsequently been scattered among a number of bodies, particularly the Ministry of Communications, the CRT and the Office of the Superintendent of Public Utilities, and of course these bodies have had no structure in place to handle or process the data, or produce timely reports. The most recent reforms have brought institutional clarity to the issue, giving the CRT responsibility for preparing a corpus of data on the sector, with the Ministry of Communications and the SSP as participants in this effort. The CRT is now setting about this important task, which will be of great benefit to the entire sector.

[51] The Constitutional Court decision states: VII Decision. By virtue of the foregoing, the Full Session of the Constitutional Court, administering justice on behalf of the People and by constitutional mandate, Resolves: to declare applicable Article 6 of the Act 422 of 1998, with the exception of the phrases "or other telecommunication service" and "or provides unauthorized telecommunication services or activities for profit" in the first subparagraph thereof, which are declared to be inapplicable. Likewise declared inapplicable are the second and third subparagraphs of that Article, which read as follows: "The above-mentioned penalty shall be increased by between one-third and one-half for any person found to have been exploiting on a commercial basis, either on their own account or through a third party, such access to or use or provision of unauthorized telecommunication services. A similar increase in penalty shall be imposed on any person who, in respect of third parties, facilitates access to or unlawful use or unauthorized provision of the service referred to in this Article." The present decision shall be notified, communicated, published, recorded in the Gaceta (Official Journal) of the Constitutional Court, archived and implemented.

[52] In Colombia the resolution of administrative controversies through the legal system can be an extremely long and complex process. On the other hand, a penal prosecution can be carried out and implemented in a very short time. In the case of value added operators the prosecutor acted swiftly—based on the law and the resolution of the Ministry of Communications—and stunned managers and CEOs of service providers with penal actions that were not expected until the resolution of the administrative procedures.

[53] It is worth stressing, however, that the regime governing both basic service and value-added service is one of open competition, and that while basic long-distance telephone service has to meet certain conditions, there is no express limitation on the number of operators that may be authorized to provide it.

[54] See Resolution 70 of January 2000.

[55] CRT opinion, "Concepto sobre criterios diferenciales de los servicios de valor agregado" ["Opinion regarding differential criteria for value-added services"], 19 January 2000.

[56] Dialpad offers free calling throughout the United States; Net2phone offers free calling from Colombia through a toll-free number.

[57] Although this paper refers to the case of Comcel, it in fact covers both Comcel and Occel as Comcel has purchased Occel and both are administered by a single president. The two continue to exist as separate entities because they cover different geographic areas of the country.

[58] The advertisement made clear reference to the fact that the new service would be based on IP technology, saying, "Thanks to Internet Protocol technology, talk to […]. The new service […] is based on the latest IP technology, […] Comcel is the first operator in Latin America to offer this IP service […]" and so on.

[59] The CRT investigation, owing to meticulous respect for due process and the right of defence, took more than a year and produced a dossier of more than 1'500 pages. The last action taken as part of the investigation was the issuance of Resolution 176 of December 1999, which left the CRT's decision in abeyance pending a decision by the Ministry of Communications.

[60] The challenge is a legal recourse that is available to a person when he or she believes that the judge or person responsible for ruling on an administrative action may be influenced by specific circumstances such as kinship. The former Mayor, Enrique Peñalosa (whose term of office ended on 31 December 2000) presided over the Board of Management of ETB, and was also a second cousin to the Superintendent of

Industry and Commerce. On those grounds, Comcel challenged the Superintendent. A challenge is resolved by the hierarchical superior, who, in the case of the Superintendent of Industry and Commerce, is the Minister of Economic Development.

[61] Under the old law there was a period of 15 days to present demands and SIC had 8 months to solve the matter and impose penalties if necessary.

[62] Indeed, in the investigation carried out by the Comisión de Regulación de Telecomunicaciones [Telecommunication Regulatory Commission] (CRT) on the provision of IP voice service, the following exchange took place, as transcribed in the background information included in the dossier: "Question: 'We're doing that test I told you about. Would you please tell me what time it is now in your location and how good the connection seems? How well can you hear me?' Reply: 'I can hear you very clearly.' Question: 'Do you sense any difference between this service and the service that you usually use for your international calls?' Reply: 'No, no difference. Sometimes there's an echo on regular calls to Colombia, but there's no echo on this line, I can hear you just fine.' "

[63] Although there are nominally six companies in Colombia's cellular-telephone market (two in each geographic region), effectively they have become consolidated into four service providers as two of them have been taken over by companies operating in the central region. In the central and coastal regions, operators have split the market fairly evenly, with each having won about 50 per cent of the subscriber base, while in the western region one of the operators has taken a lead, having won 56 per cent of the subscriber base compared to the other's 44 per cent.

[64] As of early 2001 Bell Canada holds Bell 70 per cent; ETB 20 per cent; Telecom 8 per cent, and the remaining shareholders 2 per cent. Changes in percentage of ownership are product of capitalization that was taken by Bell Canada but not others in the firm. As of 2000 Telmex is also an owner of the company through its participation in Telecom Americas who currently owns the shares that Bell has in Comcel.

[65] This latter approach is in part reflected by the "laws" that the president of Comcel seemed to go by. In his office's reception area they hand out a brochure that begins with the sentence "Laws should be broken if the circumstances require and you are willing to face the consequences, especially if they are obsolete and stand in the way of success. Three of what have come to be known as Peter's Laws are: "9. If you can't win, change the rules! 10. If you can't change the rules, ignore them! 15. Bureaucracy, like any other challenge, can be beaten by an unflinching approach, a tolerance for stupidity and, if necessary, a bulldozer."

[66] Esta situación fue resuelta por la CRT y los contratos de interconexión logrados en el 2000

[67] Statement by the president of Comcel in the CRT investigation dossier, Resolution 132, Comcel.

[68] According to the CRT dossier, traffic volume was between 6'000 and 20'000 minutes per day in December 1998.

8. Conclusion

The Colombian government is highly supportive of the development of the Internet in the country and has crafted a "Digital Connectivity Agenda" to wire the country and its institutions to the global Internet. Yet, even in those circumstances it found it very difficult to bypass or ignore existing regulatory and legal commitments that were breached by companies attempting to provide IP Telephony to their customers.

It is important to recognize that all voice services that can be offered over the Internet are liberalized. Voice over the Internet is not subject to any regulatory restriction if it is provided from or to a computer. On the other hand, existing provisions establish regulatory barriers which restrict access to international long-distance voice services via the Internet when such service is offered to or from a cellular telephone by operators other than those authorized to provide international long-distance service or when the communication originates and terminates at a telephone. This does not imply that authorized operators have any restriction on using IP technology or any other technology of their choosing in their services or networks.

The fact is that the regulatory framework that pre-dated the rise of IP Telephony in the country was a strong determinant of the outcome in the Comcel case. These developments seem to defy the commonly accepted premise that technological innovation will inevitably bypass most attempts of regulation, and therefore, it is not worth the effort of trying to set policies and regulations that attempt to shape the development and assimilation of a technology in a certain society.

Furthermore, it is worth noting that the experience of Colombia is not unique. A fairly large number of countries around the world either banned explicitly the provision of IP Telephony or has pre-existing legislation that restricts the provision of this type of service only by those with a licence to provide voice services—which in a large number of countries are only the incumbent carrier or carriers with exclusive licence or licences for such services. On the other hand, the countries that explicitly allow the provision of IP Telephony are relatively few.

Box 7: Enforcing the law

The Ministry of Communications issued Resolution 70 on 2 February 2000, by which it ended an administrative investigation concerning the three companies involved in the IP Telephony case and imposed penalties on them. The main body of the document, accounting for 14 pages out of the total 30-page length of the resolution, describes the service and analyses it against the criteria for defining a value-added service. It then discusses the four elements that distinguish the nature of a value-added service: that it must be a support service; that it must add features to the support service; that it must have distinguishing characteristics; and that it must satisfy specific new telecommunication needs. It then goes on to say, "It is not sufficient, then, under Colombian law, for it to possess the distinguishing characteristics referred to in Decree 1'794 of 1991, inasmuch as the conditions established in Decree-Law 1'900 of 1990 must be met in their entirety, and it cannot be considered a value-added service if any one of those conditions is not met." Its final conclusions with respect to the #124 service were as follows:

- The providers of the service were Comcel and Occel, the cellular providers, and not Rey Moreno, the operator of the value-added service.
- The communications used Internet Protocol technology but did not access the public Internet.
- "Colombian law classifies telecommunication services on the basis of a methodology and criteria focusing on an analysis of functionality, and not on the basis of purely technical criteria.".
- That the #124 service constitutes a teleservice[69] in which a connection is made between the TMC networks and the value-added networks of the operators involved, and one that the operators are not authorized to provide.
- That the definition of teleservices is not exclusive, and permits the provision of services not expressly described in the rules and regulations, provided that such services conform to the applicable terms and conditions and classification criteria.

The penalty imposed on each operator was a fine of 1'000 times the monthly minimum wage, an amount equivalent to approximately US$ 140'000. In the case of the Resolution by the Superintendencia de Industria y Comercio, the penalty was a fine—imposed only on Comcel—of 2'000 times the monthly minimum wage US$ 230.000.

Source: Adapted from Resolution 70 of February 2000.

[69] Teleservices are telephony, telegraphy, telex services, etc.