



# México

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Objectives:

- To find the barriers to Internet Development in México
- To see how the new National Action Party (PAN) Administration will change policies and break barriers
- To document Telefonos de México's (Telmex's) role in this development
- To make recommendations on these issues

We explore these objectives through the categories listed on your left. We hope you find this site useful, and send us feedback if you would like more information or to comment on our work.

Enjoy!

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## Economic Profile

	1998	1999	2000	2001
% Change in GDP	4.8	3.7	6.9	3.0
Nominal GDP (mil U.S.)	420972	4779478	561158	578745
Agr/GDP (%)	5.8	5.8	5.6	5.5
Ind/GDP (%)	28.7	28.8	28.8	29.2
Serv/GDP (%)	65.4	65.4	65.6	65.2
Consumer Prices (% chng)	15.9	16.6	9.5	7.9
Pop. (mil)	94.8	96.1	97.4	98.8
GDP/head (\$at PPP)	9062	9410	10100	10500
Unemploymt(%)	21.8	19.1	18.5	21.0
Cur. Act. Bal/GDP(%)	-3.7	-3.0	-3.2	-3.8

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### Education

Most public elementary and secondary schools in Mexico lack Internet, let alone computer access. Private schools and universities are slightly more developed, but still have not reached desirable levels. There are a variety of programs in place to change this situation and improve the adaptation of technology in Mexican education.

[General Education Big Picture](#): An investigation of statistics about elementary and secondary education in Mexico. This portion of the project also focuses on governmental and regulatory procedures to improve education, teacher training and to keep children in school.

[Elementary Education Statistics](#)  
[Secondary Education Statistics](#)  
 (From [www.sep.gob.mx](http://www.sep.gob.mx))

[Computer Science in Mexican Universities](#): An analysis of the availability and quality of education at the university level. This section explores the ability of Mexican technological institutions to provide a modern education despite economic limitations, and the steps being taken to further improve these technological programs. It is only with a solid human capital base that Mexico will be able to take advantage of the technological advances that are taking place on an international level.

[The Context of the Problem](#): This portion of the investigation takes the background information on education and presents the context of education and the Internet in Mexico today. The history of the Internet in Mexico is covered as well as who uses the Internet and why. The “digital divide” also is another important topic explored by this analysis. The result is a picture of Mexico that shows how much room for Internet growth there is and just how far behind the United States Mexico is.

[Theories and Solutions](#): This part of the analysis explains different options that are in place right now to help improve the educational system in Mexico in relation to the Internet. There are many different programs to distribute computers and software throughout schools, each offering an alternative to the next. This ensures there is no set path a school has to take. Additionally, there are programs to help strengthen the Internet to be a major presence throughout universities in Mexico.

[Cases and Examples](#): This portion of the analysis looks at specific cases, such as schools or school systems, and explains how the Internet has been developed in these environments.

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[Conclusions and Future Outlook](#): This information is a general summary of what was presented in the other sections and gives a future perspective of what the current programs will achieve.



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## **Telecommunications**

[Telmex, Avantel, and Alestra's Agreement](#) - Some details about this recent agreement

[Carlos Slim](#) - Exerpts of an article about him in Wired Magazine

[Avantel](#) - Case study

[Telmex](#) - Their domination in the Internet Marke

[Telecommunications Overview](#) - Some slides that paint a general picture of the Telecom Industry in Mexico

Links:

Telmex - [www.telmex.com.mx](http://www.telmex.com.mx)

Avantel - [www.avantel.com.mx](http://www.avantel.com.mx)

Alestra - [www.alestra.com.mx](http://www.alestra.com.mx)



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## **Technology Issues**

[Infrastructure](#) - Telmex and Avantel's infrastructure and new foreign investment is going to allow for internet infrastructure to be excellent.

[Interview with Arie Grapa](#) - Arie Grapa is the founder of one of the earliest ISP's in Mexico, Enternet. He was Avantel's first ISP customer. This interview gives great background information regarding the beginnings of the internet in Mexico

[Internet Culture](#) - Describes briefly part of the internet culture in Mexico

[Webpage and ISP's](#) - Describes in general requirements for web pages, ISP's and what different companies are doing

[EZLN](#) - The Zapatista Army for National Liberation has used the Internet successfully since the beginning of their struggle as a tool to distribute information and to gain national and international support, both emotional and economic.



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## **Labor Market in México**

[Mexican Employment and other Graphs](#) - This page illustrates many statistics concerning the labor market in México

[Mexican Labor Year in Review: 2000-The End of the System](#) - This is The United Electrical, Radio & Machine Workers of America (UE) publication on their review of Mexican labor in 2000. Other similar articles may be found here: <http://www.igc.org/unitedelect/> with new alerts posted here: <http://www.igc.org/unitedelect/alert.html>. Thanks to Dan La Botz for this information.





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## **Case Studies**

We conducted two case studies for ventures in México, one for profit, and one for non-profit.

[Avantel](#) - Telmex's main competitor, who recently made an agreement with Telmex, which will involve more foreign investment

[Red Escolar](#) - An initiative to bring computers and the internet to the forefront of today's education in México



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## **Conclusion: Headed in the Right Direction**

Government regulations are headed in the right direction. Because of pressure from the WTO (among other organizations) and the threat of no foreign investment, México's new administration is changing regulations to make telecommunications trading better.

Programs in education are improving. One of the main reasons the situation described above is not in place in Mexico today is money. These programs have Mexico on the right track; however, they are still in their early stages. Regardless, they will improve the number of computers with Internet access in Mexican schools. Education is one of the primary building blocks for where to implement the Internet since knowledge spreads far beyond the school and permeates society.

Internet access is becoming more and more available. Infrastructure is getting a much needed push from foreign investment, and from newfound competition against Telmex.

Telmex's monopoly is decreasing in size with better regulation, and competition will speed up technology in México.

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## Feedback

"Your front page is attractive and pretty well done. It is well titled and is easy to see at a glance. Overall, there are lots of good links in the site - good information!"

- Alan Murphy (amurphy@stanford.edu)

"Your page is very informative and makes me think about new possibilities I previously had not considered. Great job!"

- Eric Baal (ebaal@mac.com)

" This web page is a stimulating way of learning about the internet barriers. It intrigued me to want to learn more about the subject. I give the page an A+."

- Rachel Bird (rachelb@umail.ucsb.edu)

"The Mexico team obviously put hundreds of hours into this project. I'm really impressed with the in-depth research done to identify these barriers and possible solutions to them."

- Hugo Razo (hrazo@ucla.edu)

"I must say that I found this page to be both informative and entertaining. I've always considered Mexico to be the next logical source of all things technology. This page will serve, from this day on, as my proof to others. You have all done far and above that of the average webmasters. I say congratulations to you all for putting into text what I've been saying for years. Move over Toshiba, make room for Gutierrez; the eventual makers of fine cd-burners and even better digital cameras. Long gone are the days when those snooty people at Sony run us all."

- Jeff Chanley (Joeytdm@pcmagic.com)

## Your Comments

Please send us your feedback!! Use the form below to add your messages. Your input is very important to us, and will be placed on the webpage as soon as possible.

Name:

E-mail address:

Comments:

Press the submit button to send us your comments! Thanks!



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## Team México

This is our Team. We have put forward incredible amounts of hours for your viewing pleasure. If anything is unclear, you would like more information, or you just want to drop us a line, please feel free to contact us through e-mail, or through the feedback form.

We hope you enjoy the site!

[Jesse Cuevas](#) - Economics

[Kim Cowan](#) - International Relations

[Brian Bird](#) - Latin American Studies

[Gustavo Guevara](#) - Computer Science



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## Mexican Employment/Employment and the Composition of the Labor Force by Sector

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### Unemployment, January 1995 - January 2001



Note: Open urban unemployment as percentage of economically active population.  
Source: Instituto Nacional de Estadística Geografía e Informática.

<http://www.latin-focus.com/countries/mexico/mexunemp.htm>

Estadísticas sociodemográficas

### POBLACION DE 12 AÑOS Y MAS POR CONDICION DE ACTIVIDAD SEGUN ENTIDAD FEDERATIVA, 1998

Entidad federativa	Población de 12 años y más	Población económicamente activa		Población económicamente inactiva
		Total	Ocupados	
<b>Total</b>		<b>39 507 063</b>		
Aguascalientes	660 563	355 010	345 692	9 318
Baja California	1 664 589	968 653	951 949	16 704
Baja California Sur	306 119	178 383	174 926	3 457
Campeche	485 546	258 407	254 090	4 317
Coahuila de Zaragoza	1 626 905	950 700	922 531	28 169
Colima	366 328	216 836	213 470	3 366
Chiapas		1 548		
Chihuahua	2 507 076	259	1 531 252	17 007
		1 169		
Distrito Federal	2 152 930	818	1 145 893	23 925
		3 849		
Durango	6 734 225	643	3 695 390	154 253
Guanajuato	1 035 090	572 088	562 883	9 205
		1 699		
Guerrero	3 223 742	646	1 670 908	28 738
		1 247		
	2 090 432	391	1 236 926	10 465

Hidalgo	1 560 015	929 836	902 871	26 965	630 179
Jalisco		2 821			
	4 576 000	922	2 762 922	59 000	1 754 078
México		5 276			
	9 319 611	329	5 087 697	188 632	4 043 282
Michoacán de		1 513			
Ocampo	2 780 221	739	1 503 442	10 297	1 266 482
Morelos	1 161 392	658 672	647 351	11 321	502 720
Nayarit	676 406	416 371	413 247	3 124	260 035
Nuevo León		1 649			
	2 858 766	649	1 608 933	40 716	1 209 117
Oaxaca		1 348			
	2 376 821	274	1 330 335	17 939	1 028 547
Puebla		1 844			
	3 422 663	513	1 819 597	24 916	1 578 150
Querétaro de					
Arteaga	945 653	499 935	488 833	11 102	445 718
Quintana Roo	567 662	328 163	324 758	3 405	239 499
San Luis Potosí	1 604 314	804 173	795 244	8 929	800 141
Sinaloa		1 074			
	1 840 357	146	1 053 378	20 768	766 211
Sonora	1 631 742	973 037	948 711	24 326	658 705
Tabasco	1 329 894	733 459	718 595	14 864	596 435
Tamaulipas		1 116			
	1 935 956	175	1 080 988	35 187	819 781
Tlaxcala	733 168	405 008	394 888	10 120	328 160
Veracruz-Llave		2 879			
	5 011 315	132	2 823 900	55 232	2 132 183
Yucatán	1 217 383	699 026	690 347	8 679	518 357
Zacatecas	975 175	520 670	515 564	5 106	454 505

FUENTE: **INEGI**. Dirección General de Estadística. Dirección de Estadísticas de Corto Plazo.  
*Encuesta Nacional de Empleo, 1998.*

<http://www.inegi.gob.mx/estadistica/espanol/sociodem/fsociodemografia.html>

#### Estadísticas sociodemográficas

#### POBLACION OCUPADA POR SECTOR DE ACTIVIDAD ECONOMICA SEGUN ENTIDAD FEDERATIVA, 1998

Entidad federativa	Población ocupada	Primario a/	Secundario b/	Terciario c/	No especificado
<b>Total</b>	<b>37 796 736</b>	<b>7 817 369</b>	<b>9 444 760</b>	<b>20 365 673</b>	<b>168 934</b>
Aguascalientes	345 692	42 030	100 666	202 492	504
Baja California	951 949	70 240	315 403	505 470	60 836
Baja California Sur	174 926	28 930	33 039	112 957	0
Campeche	254 090	74 686	42 819	136 567	18
Coahuila de					
Zaragoza	922 531	96 000	327 716	496 976	1 839
Colima	213 470	39 885	37 910	135 223	452
Chiapas	1 531 252	862 356	166 283	501 944	669
Chihuahua	1 145 893	178 577	398 778	551 103	17 435
Distrito Federal	3 695 390	10 799	812 557	2 865 107	6 927
Durango	562 883	162 780	122 690	271 652	5 761
Guanajuato	850 133	288 265	550 154	9 205	2 509
Guerrero	1 236 926	465 557	167 227	601 522	2 620
Hidalgo	902 871	279 899	221 264	397 973	3 735
Jalisco	2 762 922	433 088	743 449	1 579 766	6 619
México	5 087 697	449 912	1 493 551	3 127 615	16 619
Michoacán de					
Ocampo	1 503 442	498 649	303 890	697 569	3 334
Morelos	647 351	98 156	143 540	405 166	489
Nayarit	413 247	116 151	64 961	231 655	480



Nuevo León	1 608 933	91 128	528 136	988 715	954
Oaxaca	1 330 335	533 823	228 435	567 671	406
Puebla	1 819 597	450 874	541 072	823 558	4 093
Querétaro de					
Artega	488 833	69 845	141 432	276 325	1 231
Quintana Roo	324 758	39 580	48 866	236 033	279
San Luis Potosí	795 244	179 537	197 620	417 904	183
Sinaloa	1 053 378	277 186	180 304	588 761	7 127
Sonora	948 711	192 701	233 015	516 311	6 684
Tabasco	718 595	240 037	127 688	350 447	423
Tamaulipas	1 080 988	146 214	283 264	638 418	13 092
Tlaxcala	394 888	70 943	145 141	178 169	635
Veracruz-Llave	2 823 900	1 011 880	477 768	1 333 940	312
Yucatán	690 347	135 672	167 883	386 737	55
Zacatecas	515 564	181 989	98 239	232 722	2 614

a/ Agricultura, ganadería, caza y pesca.

b/ Minería, extracción de petróleo y gas, industria manufacturera, electricidad, agua y construcción.

c/ Comercio, transportes, gobierno y otros servicios.

FUENTE: **INEGI**. *Encuesta Nacional de Empleo, 1998*.

<http://www.inegi.gob.mx/estadistica/espanol/sociodem/fsociodemografia.html>

### Estadísticas sociodemográficas

#### EMPLAZAMIENTOS A HUELGA POR ACTIVIDAD ECONOMICA SEGUN ENTIDAD FEDERATIVA, 1999

Entidad federativa	Total	Agricultura, ganadería, caza y pesca		Extrac-Industria Cons-Electri- ción de pe- tróleo y gas nufac- ción agua turera			Comer- cio	Trans- portes y co- muni- cacio- nes	Servi- cios a/	Admi- nistra- ción No especi- ficado		
		Minería										
<b>Total</b>	<b>31 223</b>	<b>325</b>	<b>35</b>	<b>1 8 751</b>	<b>4 911</b>	<b>46</b>	<b>6 843</b>	<b>1 196</b>	<b>7 894</b>	<b>35</b>	<b>1 186</b>	
Aguascalientes	121	1	0	0	29	11	1	9	8	55	0	7
Baja California	2 043	7	2	0	736	346	3	344	54	545	0	6
Baja California Sur	228	0	0	0	2	56	0	33	0	137	0	0
Campeche	22	0	2	0	7	0	0	9	0	4	0	0
Coahuila de Zaragoza	186	13	1	0	62	7	9	43	5	39	3	4
Colima	70	0	0	0	3	6	0	17	1	43	0	0
Chiapas	37	3	0	0	1	23	0	3	0	7	0	0
Chihuahua	36	1	0	0	14	0	0	7	1	6	2	5
Distrito Federal	3 004	1	0	0	1 025	141	0	802	47	895	0	93
Durango	460	27	2	0	180	36	0	121	5	83	5	1
Guanajuato	260	10	1	0	126	22	0	60	2	33	0	6
Guerrero	716	4	1	0	43	99	1	159	9	395	0	5
Hidalgo	537	8	5	0	165	257	0	60	12	30	0	0
Jalisco	4 877	38	3	0	1 116	240	1	1 764	404	1 301	0	10
México	7 332	59	3	0	2 870	588	1	1 091	98	1 909	17	696
Michoacán de Ocampo	322	5	0	0	54	129	4	60	2	67	0	1
Morelos	747	21	1	0	97	299	2	134	18	127	1	47
Nayarit	263	2	0	0	17	65	0	42	110	27	0	0
Nuevo León	3 610	16	5	0	1 026	333	1	752	108	1 109	0	260
Oaxaca	214	0	0	0	14	117	0	53	2	28	0	0
Puebla	1 092	8	5	0	345	408	0	160	37	124	2	3

Querétaro de													
Arteaga	326	0	1	0	234	2	0	33	4	51	0	1	
Quintana Roo	779	1	0	0	10	163	0	280	35	286	0	4	
San Luis													
Potosí	113	0	0	0	55	30	0	16	3	9	0	0	
Sinaloa	188	13	0	0	21	41	10	34	1	63	1	4	
Sonora	1 067	77	1	0	113	302	1	206	137	197	2	31	
Tabasco	112	5	2	0	1	35	1	21	29	18	0	0	
Tamaulipas	468	0	0	1	159	104	11	108	5	79	0	1	
Tlaxcala	84	0	0	0	51	1	0	11	3	16	1	1	
Veracruz-Llave	1 808	4	0	0	155	1 045	0	385	46	172	1	0	
Yucatán	94	1	0	0	18	3	0	26	10	36	0	0	
Zacatecas	7	0	0	0	2	2	0	0	0	3	0	0	

NOTA: Información proporcionada por las Juntas Locales de Conciliación y Arbitraje, Locales de Conciliación, Municipales de Conciliación y Regionales de Conciliación.

a/ Incluye servicios financieros, comunales y sociales, profesionales y técnicos, de restaurantes y hoteles, personales, mantenimiento y otros.

FUENTE: INEGI. Dirección General de Estadística. Dirección de Estadísticas Demográficas y Sociales.

<http://www.inegi.gob.mx/estadistica/espanol/sociodem/fsociodemografia.html>

Estadísticas sociodemográficas

TASA DE DESEMPLEO ABIERTO POR GRUPO DE EDAD Y SEXO, 1990-99

(Por ciento)

Período	Total	Hom-Muje-		12 a 19 años		20 a 24 años		25 a 34 años		35 a 44 años		45 y más años	
		bres	res	Hom-	Muje-	Hom-	Muje-	Hom-	Muje-	Hom-	Muje-	Hom-	Muje-
		bres	res	bres	res	bres	res	bres	res	bres	res	bres	res
1990 a/	2.8	2.6	3.1	6.7	8.0	4.1	4.9	1.6	2.1	1.2	1.3	1.7	0.7
1991 a/	2.6	2.5	2.9	6.3	6.7	3.9	4.9	1.8	2.3	1.4	1.4	1.2	0.6
1992 b/	2.8	2.7	3.2	6.4	7.5	3.9	5.1	2.1	2.4	1.5	1.1	1.5	1.1
1993 c/	3.4	3.2	3.9	6.9	7.9	5.0	6.9	2.4	3.2	1.9	1.7	2.0	1.4
1994 d/	3.7	3.6	3.9	8.0	8.6	5.5	6.5	2.9	3.3	2.0	2.0	2.2	1.2
1995	6.2	6.1	6.4	13.0	13.4	9.3	10.8	5.3	6.0	3.9	3.6	4.1	2.1
1996 e/	5.5	5.3	6.0	10.9	12.3	8.3	9.5	4.4	5.7	3.0	3.2	3.7	1.9
1997	3.7	3.5	4.2	7.5	9.4	5.7	7.4	2.8	3.8	1.8	2.2	2.3	1.5
1998 f/	3.2	2.9	3.6	6.9	7.2	5.0	7.1	2.4	3.5	1.5	2.0	1.7	0.8
1999 g/	2.5	2.4	2.7	5.8	5.7	4.2	5.1	2.1	2.8	1.3	1.5	1.3	0.6

NOTA: Las cifras corresponden al promedio simple aritmético de los datos trimestrales.

a/ Las cifras corresponden a 16 áreas urbanas.

b/ A partir de enero las cifras corresponden a 32 áreas urbanas y desde julio a 34.

c/ A partir de abril las cifras corresponden a 35 áreas urbanas, desde julio a 36 y a partir de octubre a 37.

d/ A partir de julio las cifras corresponden a 38 áreas urbanas y desde octubre a 39.

e/ A partir de enero las cifras corresponden a 41 áreas urbanas y desde octubre a 43.

f/ A partir de enero las cifras corresponden a 44 áreas urbanas.

g/ A partir de enero las cifras corresponden a 45 áreas urbanas.

FUENTE: INEGI. Dirección General de Estadística. Dirección de Estadísticas de Corto Plazo.

*Encuesta Nacional de Empleo Urbano.*



# México

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## Avantel Telecommunications

**Company Overview-** Avantel Telecommunications Since the Mexican telecommunications market was opened to competition in January of 1997, Avantel has prided itself on servicing commercial and residential customers with cutting edge data transmission technology. With investments of over \$2 billion and over 2,000 employees, Avantel is committed to providing the highest quality transmission services with an emphasis on consumer satisfaction.

Avantel is a joint venture between Grupo Financiero Banamex-Accival (55%) and MCIWorldcom (45%), an alliance which blends immense resources and expertise. With an annual income of over \$30 billion dollars, WorldCom combines financial stability and diverse resources to identify the best growth opportunities in the industry with an outpost global network. WorldCom's strategy focuses on investments in high growth areas such as data/Internet transmission services and local and international communications services. It is the second largest provider of long distance service in the United States, with a fiber optic network over 45, 000 miles long.

Avantel was the first company to be awarded a long-distance license in Mexico, and is the premier challenger to the former national telecommunications company, Telmex. It maintains central offices in Mexico, Guadalajara and Monterrey. CEO Francisco Gil Diaz leads the company under a new philosophy of customer-client treatment which will purportedly lead to telecom services never before experienced in Mexico.

**Corporate Strategy-** Avantel has positioned itself as the leader in cutting edge technology that will provide cheaper data transmission services for the citizens of Mexico. Its innovative network designs allow faster and more reliable transmissions than existing structures, and its commitment to a higher level of customer service makes it very popular in the minds of many Mexicans. It is a first mover in telecommunications technology and is aggressively competing to take advantage of the huge forecast growth in Mexico. Avantel currently seeks to capture 35% of the telecommunications market in the next couple of years and then expand to further challenge Telmex.

**Technology/Products-** Avantel has recently introduced packet services, a private voice and data network based on digital standards, private line, fax service, and products such as Internet access and frame relay. Avantel also offers a full range of domestic and international long-distance telecommunications services - switched and non-switched voice, data and image transmission, phone lines, corporate calling cards, business conferencing services, and Internet access to business, governmental, and residential

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customers throughout Mexico.

In August 1999, Avantel obtained a local service permit and launched Avantel Servicios Locales, S.A. ("Avantel Local") to provide local telephone service early in 2000.

Avantel is also one of the fastest and most efficient options for connecting to the information superhighway. Connections are fast, immediate, and efficient due to Avantel's exclusive high performance network. By connecting to the internet with Avantel, consumers receive an email account with 5 Mb of capacity or 5Mb of space for a personal web page, both with unlimited use.

**Infrastructure-** Avantel initially invested \$1 billion in network infrastructure and is spending an additional \$1.2 billion over the next four years. A \$650 million project is constructing a fiber optic network around Guadalajara, Monterrey, and Mexico City, Mexico's three largest cities. This triangle represents 75% of all inland long-distance traffic in Mexico, and Avantel plans to extend the network to cover all of industrialized Mexico.

Avantel's 6,300 km optical fiber network allows hundreds of thousands of clients to communicate to any place in Mexico and more than 280 countries in the world with guaranteed savings. The quality of this operations network was confirmed when Avantel became the first telecommunications company in the world to receive certification ISO 9002. Avantel's innovative network design is based on three double rings around Mexico, Monterrey, and Guadalajara, with interconnectivity to any part of the country. This allows faster service, greater dependability, and continued service even if part of the network fails. Four Intelligent Power Stations, two Customer Service Centers, and a Network Monitoring Center provide increased customer attention and network security. Avantel's internet backbone reaches speeds of more than 1.000 Mbps with 99.98% reliability.

**Operations-** On January 19, 2001, Avantel announced the beginning of local telephone service in the Federal District and Conurbadas zones, and by next February in Monterrey and Guadalajara. The number 2 telecom official in the country, Javier Vieyra, publicly stated that Avantel had invested 200 million dollars to serve these local markets after numerous customer requests. Construction will continue throughout 2001.

A recent agreement also ended a four-year legal battle between Telmex, WorldCom and AT&T, and paved the way for further telecommunications growth. Telmex recently agreed to drop charges against Avantel and an AT&T affiliate, Alestra, when the two carriers each agreed to pay Telmex over \$60 million to satisfy past due fee claims of the incumbent monopoly. The Mexican telecommunications king also agreed to charge both companies 75% of its lowest commercial rate to carry long-distance calls to remote areas in its 'last mile plan'. Telmex surrendered some rights to fees on incoming international traffic and allowed its competitors to handle a larger portion of incoming traffic. Rivals agreed to stop all illegal routing of international traffic which Telmex claims costs it millions of dollars per year.





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## Case study of "Scholar Net" and Red Escolar

"Scholar Net" is a program started by the distributors of Linux that works with the Red Escolar program started by the Mexican government with the purpose of bringing computers and the Internet to all public elementary and secondary schools throughout Mexico in order to raise the quality of education. Using new methods of communication, important information can be shared by all parts of the country and the standard of education can be technologically revolutionized.

The program was established in the late 1990s and helps teachers and students to learn how to find information they are looking for and to establish informed opinions and questions about these topics. The program looks to accomplish the goal that all children become authors by having their work put online. Children would also be able to take advantage of the host of opportunities available through computers and the Internet ranging from information databases to email to computer programs.

Another goal of this program is to train children to have the skills necessary to continue to a technical school or to work toward a technical profession. Through "Scholar Net" and Red Escolar, the children have an early exposure to the current technological standards of the job market and can establish a foundation to continue technical training later.

But the program is not only geared toward future technically students or professionals. It also looks to inform the student population as a whole of what opportunities are available through computers and the Internet. In its most basic use, Red Escolar provides a simulated Internet that is broadcast over the country's educational satellite and is viewed on televisions. This way, children are able to grasp the concept of what the Internet does.

Red Escolar may either work alone or as a complement with other programs that provide computers and/or Internet access such as Tachyon.net, Microsoft's computer distribution program, the ILCE or an Electronic Peace Corps (not currently in place, but a theory). One major economic step taken by these programs is that Linux is the operating system put on the computers in Mexican schools. The OS and programs for it are entirely free and can be downloaded from the Internet. This saves a great deal of money. For example, Microsoft would charge \$50 per license of Windows 98, even at a discount rate.

Therefore, Linux and the Mexican government are working together to share the wealth of computers and the Internet to children in Mexico at the cheapest possible price.

The other programs mentioned above each can provide a specific way to help Red Escolar and "Scholar Net." Tachyon.net provides computers and wireless Internet access that would work with Linux and the Red Escolar wiring in place in schools to provide a computer lab of five to ten computers in a school for

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\$300-400 per month. Microsoft's computer distribution program and the ILCE work together, along with other computer companies to provide computers to schools. The ILCE will match whatever funds a school provides to buy a computer and then find the cheapest price on used computers from companies such as Microsoft. Finally, the Electronic Peace Corps would solicit used computers from computer companies and distribute them throughout Mexico.

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This page uses frames, but your browser doesn't support them.



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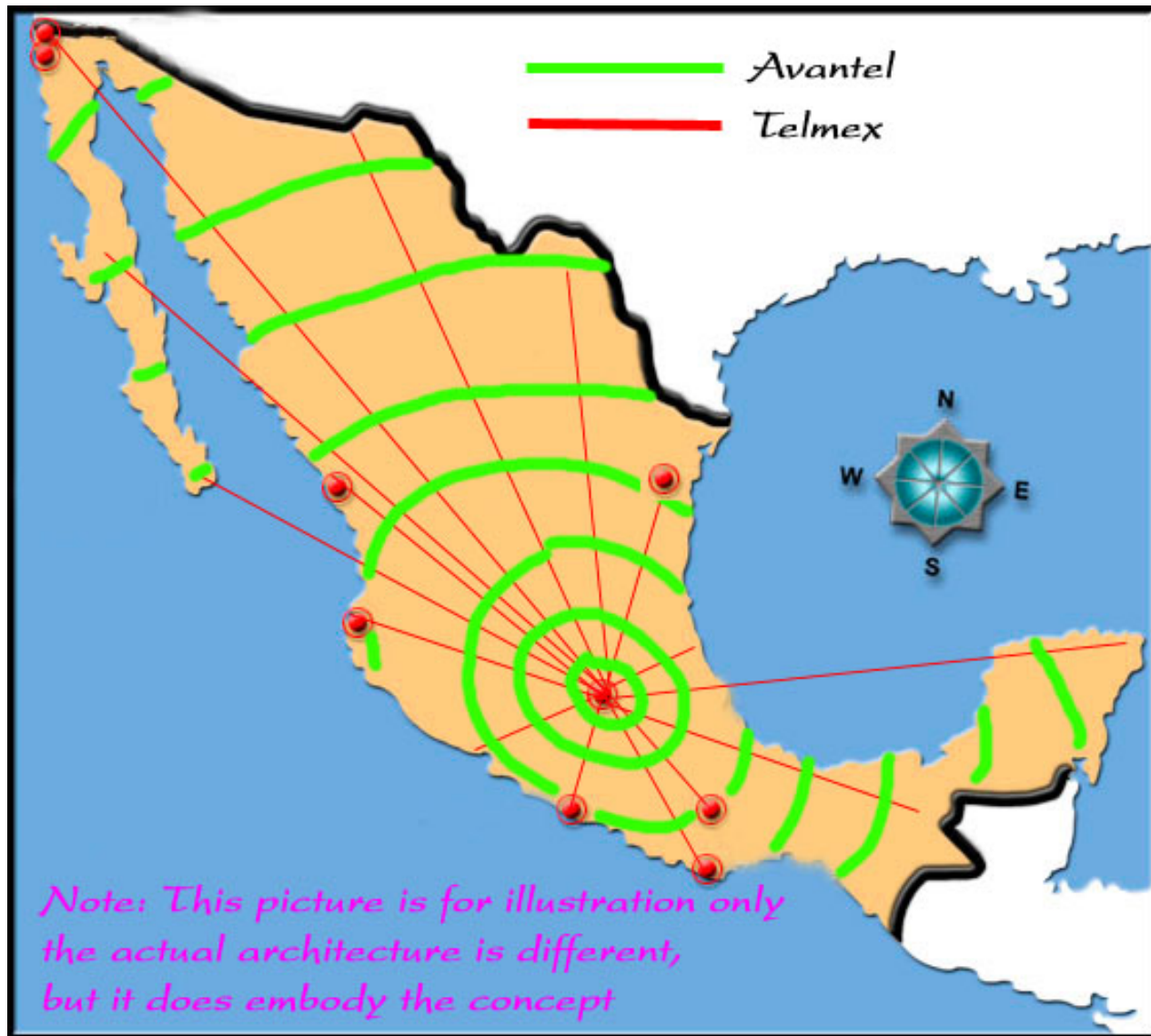
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### Infrastructure and Access

The image below is a representation of Avantel and Telmex's infrastructures. Avantel has a circular structure, and Telmex has a star structure. the advantage to the circular structure (not too well drawn, but close enough) is that if a line gets cut, you can still go around the circle in the other direction. With a star structure, if a line gets cut, then the transmission doesn't get through.



New investment from Avantel (resulting from the new agreement) will provide even better infrastructure than before. Competition resulting from this will cause Telmex to step up as well, which in turn will improve technology everywhere.

Local calls are not metered, meaning you get charged a fixed amount no matter how long the call. There are three free ISPs in México right now, Terra, Todito, and StarMedia. As far as internet access goes, people will only need a telephone line and a computer with a modem. In urban areas, ISDN, cable modems, microwave, and E1 lines are getting more and more affordable for businesses, but not for individual consumers.

The "last mile" connection problem will hopefully get better as Telmex and Avantel start getting on better terms. The only problem that remains now is if a consumer has a computer or not. In order to alleviate this cost, Telmex and Todito (among others) offer to sell brand name computers at a fixed interest rate for an extended period of time. This allows people to essentially take out a loan in order to have a computer.



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## **Entrevista con Arie Grapa**

En 1995, había tres proveedores de Internet: UNAM, ITESM, CONACIT. La UNAM y el ITESM (Tec de Monterrey) vendían acceso de Internet a compañías en forma de una línea de 64Kbps. CONACIT era la única entidad 'autorizada' para vender acceso de Internet.

En esos entonces, Banamex y MCI se unieron para formar Avantel. Bancomer se junto con AT&T para formar Alestra. Avantel empezó a poner fibra de vidrio en la república, en forma de círculos, para evitar problemas con la configuración de estrella que tiene Telmex (Teléfonos Mexicanos). Con esta configuración, si se llega a cortar un cable, tiene otra forma de transmitir la señal telefónica o digital. Lo que hasta hace poquito no fue resuelto es que Avantel tenía que pedirle a Telmex que le conecte la "última milla" a sus clientes.

La "última milla" es la conexión del cliente al enlace de la otra compañía, que en este caso es Avantel. Telmex, para tratar de manipular a la competencia, se tardaba mucho al conectar esta última milla. Arie llegó a estar en negociaciones con Avantel para poder apurar estas instalaciones, pero finalmente nunca se hizo nada. Arie también tiene cableado directamente a Avantel, y así nunca se ha caído el acceso de Internet de él o de sus clientes (dial-up y webhosting). Hace poco era rumor que Avantel iba a poner dos líneas de 155 Mbps a los EEUU, pero no lo puede confirmar en este momento.

Alestra contrataba a Avantel para su servicio de larga distancia e Internet.

Avantel en ese entonces tenía dos salidas de Internet a los Estados Unidos, que es de lo más importante, para poder acceder el Internet en completo. Los EEUU tienen enlaces muy grandes al resto del mundo, y la mayoría del tráfico de Internet es ahí.

Ahorita, Avantel ya le ofrece a ISP's independientes que les subrenta el ancho de banda directamente al cliente por una cuota pequeña, para poder que crezcan los ISP's pequeños.

En los EEUU es más fácil poner un ISP (Internet Service Provider), porque las llamadas locales son gratis, pero en México, hasta hace poco, no era así. Ahora es un cargo fijo por llamada. Hay acusaciones de Telmex que cortaban la llamada local de acceso de Internet, para poder ganar más dinero.

Infosel tiene al periódico La Reforma, y vendió su división de telecomunicaciones a Terra, el proveedor más grande en México. Terra ahorita ya está dando acceso de Internet gratis.

Telmex tenía dos divisiones de Internet: Empresarial, con líneas fijas, y personal, con modem. Telmex se vio muy hábil al dejarle de comprar a la compañía más grande de cableado de cobre, y ya que estaban apunto de quebrar, Telmex los compro. Algo similar paso con Red Uno, el distribuidor de Cisco más grande en esos entonces. Igual, Telmex le compro Cablevisión a Televisa, por su potencial de dar acceso por cable, y para poder controlar esa parte de la industria. Hasta el momento, Telmex es la única compañía autorizada para poner conexiones ISDN, entonces también controlan ese mercado.

En los EEUU, los modems de 56.6Kbps están limitados a bajar información a 53Kbps, y a subir información a 33.6Kbps. Hasta ahorita, son muy pocos los ISP's en México que pueden garantizar que la conexión va a llegar a esta velocidad, y Enternet es una de las pocas compañías que logran hacer esto.

Network Information Center (NIC- nic.mx) es la asociación que regula los dominios de Internet en México. Fue fundada en el ITESM, y recientemente se despego y se hizo una organización independiente. NIC controla todos los dominios en México, y el registro de todos los ISP's.

También hay compañías que dan acceso por satellite, como Inversat.

Normalmente, un ISP puede sobre vender el acceso, porque la probabilidad que todo mundo este usando el ancho de banda completo al mismo tiempo es insignificante. Normalmente es al dos por uno, pero había un rumor que Telmex estaba sobre vendiendo al cuatro por uno. Avantel ahorita es la única empresa que garantiza el ancho de banda que vende.

El negocio de un ISP es comprar un ancho de banda grande, y vender a muchos clientes un ancho de banda mas chico.

America Online esta empezando a entrar a México en este momento.



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## **Internet Culture in México**

Here are a series of articles collected regarding Internet Culture in México:

[Messenger](#) - Microsoft's Messenger Service

[Fraud](#) - Fear of Internet Fraud deters e-commerce and new investment

[Bush goes to Mexico](#) - The US's new administration speaks to México's new administration, and discusses opening up trade and new investment.

[Credibility](#) - Lack of information regarding Internet Users in Latin America deters new investments

[E-Commerce rising](#) - This article shows how people are getting used to the idea of purchasing online

[Cibercultura in Mexico](#) - This articles demonstrates how Cyberculture in Mexico is increasing.



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Vast majority of instant messaging users use MSN Messenger

- Portable
  - Can use any computer that has Messenger installed
  - Contact list remains the same
    - Unlike competitors, don't have local files
  - Hotmail e-mail notification
- Hotmail interaction
  - Portable
  - Don't have to be at home
- Not everyone has internet access
  - Convenient to check e-mail on any computer
    - Your own home
    - Cyber-Café
    - Friends home
    - Work



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*September 29, 2000, 8:44 AM PDT*

## **Fear of Fraud Hampers Latin American Web**

A low rate of Net penetration doesn't help, either, but a researcher expects profits in 2003.

*[By Daniel Helft](#)*

Low Internet penetration and a perceived risk of credit card fraud are the factors that most restrain the takeoff of e-commerce in Latin America, according to the research group International Data Corp.

IDC polled 165 Latin American online merchants. Participants asserted that consumer wariness seems unfounded – 73 percent of them said they conduct secure transactions using the same technology as their U.S. counterparts.

"It will be critical to educate the target market over the next few years," says Anika Alford, director of Internet research for IDC Latin America.

Most e-commerce companies in the region offer their customers offline alternatives to pay for goods ordered online.

Alford says other important factors that curb the growth of online sales include the socioeconomic reality of the region: high inequality of income, low credit card penetration, high delivery costs and an inadequate telecom infrastructure.

But despite the significant hurdles, the figures show that online sales are growing fast, especially in business-to-business. According to IDC, total online sales are expected to be about \$1.8 billion this year, up from around \$500 million last year. Projections show that number shooting up to around \$11 billion in 2003. Only 10 percent of e-commerce involves b-to-b transactions, but that figure should surge to 75 percent three years from now, because most of the region's largest corporations are moving fast to open online channels.

Though most companies polled said they expected to turn a profit within two years, Alford considers such projections overly optimistic; she says that three years is more likely. She said profitability "will occur around 2003 which happens to coincide with the reach of a critical mass of users." About 12 million Latin Americans use the Internet, a number that is expected to triple by 2003.

Original Article: <http://www.idg.net/go.cgi?id=418633>





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February 15, 2001

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Web posted at: 10:10 a.m. EST (1510 GMT)

by Kevin Roderick

[Education](#)

(IDG) -- Call it the cowboy boot summit. George W. Bush takes his first official foreign trip Friday, to the ranch of Mexico's horseback-riding President Vicente Fox. The two new leaders are expected to talk about immigration, trade and Mexico selling electricity to California. Fox is also expected to continue his crusade to bring Mexico's 97 million people into the digital age with the help of U.S. investment.

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But standing in the way is a powerful force: Carlos Slim Helu, who controls Telefonos de Mexico, or Telmex, the country's dominant phone company. For years U.S. telecom companies have been trying to crack the \$12 billion Mexican market and have come up frustrated largely due to Slim's resistance. The faceoff got so contentious that last year the United States filed a complaint against Mexico with the World Trade Organization.

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Telmex operates nearly all of Mexico's 12 million phone lines, is the leading ISP and even sells discounted PCs that customers need to hook up to the Net. Slim's also a partner with Microsoft (MSFT) in T1MSN.com, Mexico's premier Web portal. His \$8 billion empire extends beyond technology to cigarettes, chemicals and retail, making him Mexico's biggest employer.

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Slim's clout doesn't stop at the Mexican border. In the United States, Slim and his three sons hold controlling stakes in Prodigy and the CompUSA retail chain, plus lesser interests in retailers OfficeMax (OMX) and Saks (SKS) . Last week, Telmex spun off its wireless business as America Movil, which begins life as one of the world's largest wireless providers, with 12 million subscribers.

For all of his technology plays, Slim doesn't use computers himself. But he believes in their power to transform Mexico into an economic powerhouse. In that, he and Fox see eye-to-eye. But whether the two men will work out the details of their considerable differences is still a question.

The first obstacle is politics. Slim built his fortune during the decades that the Institutional Revolutionary Party ruled Mexico, and he was close to former president Carlos Salinas de Gortari. Fox comes from the business-oriented National Action Party and campaigned against the PRI's legacy of corruption. Nonetheless, Fox and Slim need each other, and many expect them to find a way to work together.

That will take some doing. Fox wants to double the number of domestic phone

lines, and Telmex is the logical company to do that. But Fox's advisers say Telmex impedes progress -- its hold on the market allows it to resist competition and charge high fees. Daniel Suzuki Lavin, a technology manager at Allianz Mexico, a subsidiary of German insurance giant Allianz, gripes about poor service from Telmex. "They don't apologize, and there's no way to complain," he says.

Mounting political pressure and prodding from Mexican regulators, however, is forcing Telmex to change its ways. In January, Telmex announced far-reaching agreements to improve access for its chief rivals, WorldCom (WCOM) 's Avantel and AT&T (T) 's Alestra. "We have huge competitors now," says Telmex commercial director Isodoro Ambe Altar.

That's partly true. But Fox and Slim still have to work together on further opening the market and wiring Mexico.

Original Article:

<http://www.cnn.com/2001/TECH/industry/02/15/wired.mexico.idg/index.html>



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*August 28, 2000*

## **Latin America's Credibility Gap**

The absence of Internet ratings data is making business difficult for everyone. And CEOs are starting to get cranky.

*[By Daniel Helft](#)*

When investors in latin America merrily threw money at startups earlier this year, they didn't mind the dearth of information on Net usage in the region.

These days, however, weary fund managers and venture capitalists have a newfound love for statistical data. "There is money going around but investors are more focused, more realistic and want to stand on more solid ground," says Daniel Baranowski, an associate at consulting firm Bain & Co.

Finding solid ground, however, is difficult because reliable data on Internet traffic is nearly impossible to obtain. An estimated 12 million people in Latin America use the Web, a figure that is expected to quadruple by 2003. But no one is sure what these people are doing online because there is no independent third-party measurement here like that provided by [Media Metrix \(JMXI\)](#) and Nielsen [NetRatings \(NTRT\)](#) in the United States.

That is particularly troublesome in an area where Net companies made especially exaggerated claims when the good times were rolling.

"Investors are obviously turned off by a region where they feel everybody is lying," says [Fernando Espuelas](#), chairman of New York-based StarMedia Networks. The former poster boy for the Latin American Internet is frustrated because stock in his company, one of the first Internet success stories in the region, is down 80 percent from its high earlier this year. He blames the lack of Internet traffic data for StarMedia's fall from grace and is on a campaign to improve the measuring tools in the region.

Espuelas, however, didn't complain about poor data when times were good, so some consider his comments whiny. Nonetheless, some of StarMedia's competitors such as [El Sitio \(LCTO\)](#), AOL Latin America and Terra Networks agree on the need to measure traffic to Web sites from listening posts out on the Internet rather than inside individual companies.

Until external measuring is possible, dot-coms are using the internal approach and hiring auditing firms to verify their measurements of Web traffic to their

sites. Espuelas, for example, uses U.S.-based ABC Interactive and says he will pay for his competitors to have that same company audit their sites. El Sitio and the others scoff at his challenge, saying they've hired other reputable auditing firms to verify traffic to their sites.

All this is confusing to investors and advertisers who are trying to make sense of the market in Latin America, so they, too, are joining the call for better measurement of Internet traffic in the region.

"There really is a bit of a void of information," says Chris Hussey, Latin American Internet analyst at Goldman Sachs in New York. "The region would really benefit from a reliable independent third-party participant."

Audit firms such as ABC Interactive and Engage I/Pro do not fully solve the credibility gap because there are many ways that Internet firms can tinker with internal traffic figures. Even if auditors pore over the log files of a company's Web servers, people will always be suspicious of data that comes from inside Internet firms.

Ratings firms such as Media Metrix track performance outside company walls using software installed on the computers of select consumers, a method similar to measuring television audiences.

Even though figures from Media Metrix and other ratings firms are often criticized as unreliable, investors and entrepreneurs in Latin America say that flawed ratings data would be better than none at all.

Through a partnership with French market research group Ipsos, Media Metrix is setting up operations in Brazil, where it expects to be up to speed by the end of the year. The rest of Latin America is still a couple of years away from having those measurements. Nielsen has not brought its Internet ratings to the region.

While Media Metrix gears up, business is brisk for auditing companies even though dot-coms realize they are only a partial solution. Engage I/Pro says its business in Latin America has tripled since the beginning of the year. The company attributes its growth to startups that need to make a stronger case to investors if they hope to go public.

Convincing analysts of their true market position has also become more important for companies that are already publicly traded. Given the recent volatility in securities markets, a negative comment from a Wall Street bank can devastate fragile Internet companies. StarMedia recently lost \$1 billion in market capitalization in one day after Merrill Lynch downgraded the stock because its analyst estimated traffic figures to be lower than previously thought. El Sitio is down 75 percent from its IPO on the Nasdaq in December, in part because of concerns over how much traffic it really generates.

Increased concern about traffic figures is causing Internet CEOs to snipe at each other. Over the past few weeks, Espuelas has openly suggested that El Sitio, which is audited by Engage I/Pro, has inflated its figures.

El Sitio CEO Roberto Cibrian Campoy shrugs off Espuelas' attacks. "When you have to talk about yourself all the time it's because you're not that sure of where you stand," he says.

Espuelas sums up his position: "All I'm saying is that if I'm a midget, fine. But if I'm a giant, like a think I am, I want to stick out."

But with sagging stocks and scarce numbers to back up their claims, it's extremely difficult to tell the midgets from the giants right now.

Original Article: <http://www.idg.net/go.cgi?id=418633>



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*October 10, 2000, 4:55 PM PDT*

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### Latin American E-Commerce Heats Up

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Online retail will grow over 400 percent this year in Latin America, but it's still a minor market compared with Asia.

[Regulation](#)

*[By Joshua Hallford](#)*

[Telecom](#)

Despite worries about the long-term economic health of Latin America, the [Boston](#) Consulting Group and Visa estimate that \$580 million will be spent online in the region this year. That's an increase of 432 percent over 1999's total of \$109 million.

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But Latin American e-commerce is just a drop in the bucket compared with this year's retail e-commerce estimates for the U.S., Europe and even Asia which are expected to reach \$61 billion, \$9 billion and \$7 billion, respectively.

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In their survey of 85 online retailers released Tuesday, BCG and Visa found that Brazil is expected to contribute \$300 million, more than half of the region's total. The expected runners-up are Mexico with \$91 million and Argentina with \$82 million.

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The largest e-commerce draw in the region is consumer-to-consumer auctions, which will pull in \$192 million this year, up from a mere \$12 million last year. BCG and Visa attribute the strong growth to large-scale advertising, regional expansion, rapid growth in product selection and increased competition. Other top categories include computer hardware and software (\$72 million), brokerage and financial services (\$62 million) and entertainment items (\$59 million).

[Team México](#)

Although some categories are winning more buyers, only a few merchants are capturing the bulk of the market. The top 20 e-commerce sites account for 73 percent of online sales. BCG and Visa predict that only the top merchants, out of a current field of more than 1,300, will survive. Last year, a third of Latin American e-commerce spending was on U.S. imports. But that has declined rapidly. This year, only 7 percent of total e-commerce sales – \$40 million – will be imported from the U.S.

But forecasts can't be entirely rosy because e-commerce growth in Latin America is limited by the extreme economic disparities characteristic of the region – only the wealthiest few can afford to access the Internet, let alone participate in buying online. Currently, about 13 million Latin Americans – or 3

percent of the population – are online, according to IDC. And only 17 percent of Latin American adults can afford Internet access at home.

While Net access costs have declined 23 percent in Argentina, 20 percent in Mexico and 8 percent in Brazil in the past year, the price of getting online is far out of reach for the vast majority of the region's impoverished population.

Retail e-commerce is still in its infancy in Latin America, where just 58 percent of online orders were delivered on time and where 38 percent of purchases are paid for by methods other than credit cards.

"Not only do online retailers need to iron out some of their operational difficulties" like product selection, slow delivery time and poor customer service, according to BCG VP Thomas Weinrich, "They also have to develop business models suited to the unique challenges and characteristics of the Latin American market."

Original Article: <http://www.idg.net/go.cgi?id=418633>



# México

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*October 13, 2000, 3:46 PM PDT*

[Economic Profile](#)

## **Study: Cibercultura on the Rise in Mexico**

[Education](#)

A ratings firm evaluates Net usage south of the border, shedding new light on the Latin American market.

[Regulation](#)

*[By Genia Jones](#)*

[Telecom](#)

Undaunted in their march toward global Web coverage, ratings firms are moving to take the pulse of the online population in Latin America. The first results of a study in Brazil came from [Media Metrix \(JMXI\)](#) last month. Now ratings firm NetValue, based in Paris, has released a new survey on Internet usage in Mexico.

[Technology](#)

NetValue estimates 571,000 people in Mexico are online. When online, Mexicans spend less time on average than surfers in other countries studied by the firm – the U.S, Germany, France and the U.K. Surfers in Mexico logged on an average of 7.6 hours per month compared to the U.S. average of 11.2 hours. But Americans actually spend more time online than Net users in the U.K., Germany or France.

[Labor](#)

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Mexico's Net population also has a significant number of women and younger people. While Mexico's results show that 41 percent of the online population are women, only 34 percent of those logged on in Germany were women. The gender discrepancy is slightly wider in France, where 40 percent of Internet users are women.

[Conclusion](#)

The age of Mexico's Internet surfers was the youngest of all the countries surveyed. Those surfers between ages 15 and 24 account for 37 percent of all Internet users, compared with only 18 percent of the U.S. surfing population. In fact, 67 percent of all users in Mexico are under 34.

[Presentation](#)

Once online, Mexicans are more likely to use instant messaging, chat and audio-video features, and lead the U.S., Germany, France and the U.K. in these activities. Forty percent of Internet users in Mexico use instant messaging, with only 32 percent using it in the U.S.

[Feedback](#)

As in many countries, big-brand U.S. sites and domains are the most-visited Web destinations, with MSN.com attracting almost 68 percent of Internet users and [Yahoo \(YHOO\)](#) .com drawing 67 percent. Notably, the Yahoo Mexico site was visited by only 30 percent of surfers.

[Team México](#)

Original Article: <http://www.idg.net/go.cgi?id=418633>







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## Websites (web-developer's point of view)

- Professional looking
  - Well designed
  - Secure (ssl, encryption, etc)
  - Not too many banners
- Dynamic Content (ASP, JSP, CGI, etc.)
  - Interaction with Database
  - Change with users preferences
- Good Content
  - News, Search Engines, etc.
  - Stores - Products
    - Ability to compare
    - Consistent and Accurate information
    - Straightforward shopping
- Website needs to be “friendly”
  - If too much movement, dizziness effect (want to leave site)
    - Attention is distracted
    - Content is less apparent
  - Few advertisements

## ISP (Internet Service Provider)

- Tech Support
- Speed
  - Lower than should be (from personal experience)
  - 56K @ 2.5Kbits/sec, instead of 5Kbits/sec
  - Cable modem 12Kbits/sec instead of at least 30Kbits/second
  - Why? Because of implementation.
    - Noise lowers modem speed
    - Cable modem's are “shared,” so more people sharing, the lower the bandwidth
- Dependability
  - Accusations of cutting off phone calls to get more revenue
- Ease of use
  - AOL (America Online) in the US is very straightforward
  - Some ISP's such as Telmex offer free internet classes
- Lower bandwidth costs
  - Because so close to the US, can route information through there
  - No big wiring costs

## Portals:

- Todito (todito.com)
  - Website

- Very flashy, a lot of movement
- Large use of Flash, JavaScript
- Store
  - Not “friendly”
- Yupi (mx.yupi.com)
  - Website
    - Good, clean, professional
    - Banners need to be less attention grabbing
  - Store
    - “Links” to other sites
    - Not appealing, since it takes you out of the “comfort zone”
- Yahoo (www.yahoo.com.mx)
  - Has the effect of being translated
  - Search engine in Spanish
- Hispavista (www.hispavista.com)
- Wau (www.wau.com)
  - Wireless Internet Portal, in Spanish
  - Too specific
    - Need to have a certain provider (Pegaso)
    - Only certain phones work

## E-Commerce:

- Todito.com (dataflux-e)
  - Links to individually run stores
- PcPronto.com
  - Computer “super-store”
- PC-enlinea (www.pc-enlinea.com)
- Computer “super-store”

## 150 ISP's, and population

Jurisdiction	1970	1980	1990	2000	Change	% Change	% of Growth
Distrito Federal	7,006	8,831	8,236	8,591	1,585	22.6%	16.7%
Mexico (State of)	3,798	7,564	9,816	11,708	7,910	208.3%	83.3%
Total	10,804	16,395	18,052	20,299	9,495	87.9%	100.0%

Population in thousands

(<http://www.demographia.com/db-mxc7090.htm>)

Name	Abr.	Capital	A-L (km2)	Cf 04.06.1980	Cf 12.03.1990	Cf 05.11.1995	Cp 14.02.2000
Distrito Federal	D-F	FDist <a href="#">Ciudad de México</a>	1499	8831079	8235744	8489007	8591309

[http://www.citypopulation.de/Country.html?E+Mexiko\\$Mexico](http://www.citypopulation.de/Country.html?E+Mexiko$Mexico)

**E-commerce in México**

To buy products online, there has to be an advantage over retail stores:

- Price + Shipping = Lower
- Hard to find products
- Logistics
  - Time to get product to you
- Reputation
  - Warranty
  - Customer Service

Payment options:

- Charge on Delivery
- Deposit into their bank account
- Visa/ Mastercard

Why would you do any of these?

- Charge on Delivery
  - take personal check at time of delivery
  - 1.75% surcharge over total
- Deposit into their bank account
  - Buy online, go to bank, deposit into their account, wait for delivery.
  - Takes longer than going to store
- Visa/ Mastercard
  - Interest rates are sky high



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## **EZLN - Their use of the Internet to advance their campaign**

"El problema de Chiapas no se resolvera en la red; sin embargo, el Internet puede ser una herramienta poderosa para el activismo y la diffusion de la información (por ello, la existencia de esta pagina)."

Quote from <http://www.ezln.org/about-sp.html>

The translation of it would be something like: The problem in Chiapas will not be resolved on the net; nonetheless, the Internet can be a powerful tool for activism and the diffusion of information (for that, the existence of this page).

New years day, 1995, after one of the worst economic depressions in years, the Zapatista Army for National Liberation, EZLN, launched their campaign for indigenous human rights. The government attempted to isolate them deep in the jungles of the state of Chiapas, in order to silence them. However, they were able to get their views out in the public eye by using the Internet. This allowed for international support, both emotional and economic. Today, they control the content of two websites:

- [ezln.org](http://ezln.org) - This is the official site of the EZLN. Contains their mission statement, and information for economic support
- [ezlnaldf.org](http://ezlnaldf.org) - This is the official website of the so called "Zapatour", a peaceful march to Mexico City, led by EZLN leader, Subcomandante Marcos. This march is currently going on, and the EZLN's supporters are being kept up to date of all events that are going on.

Here are a couple other articles that are interesting:

[A Comment on the Zapatista "Netwar"](#) - This is a great article that outlines many of the issues surrounding the Zapatista's use of the Internet.

[The Zapatistas and the Electronic Fiber of Struggle](#) - This article was published in November 1995, almost a year after the EZLN launched their campaign.

[Bailing out Zapatista Prisoners](#) - Telmex and the Mexican Governments formed a plan to make bail bonds for Zapatista prisoners.

MEXICO: Mexico launches bail-bond program for Indians.

03/02/2001

Reuters English News Service

(C) Reuters Limited 2001.

MEXICO CITY, March 2 (Reuters) - The Mexican government on Friday introduced a joint program with telecoms giant Telmex to provide bail bonds to indigenous activists in state prisons.

The program, unveiled by President Vicente Fox during a tour of heavily indigenous Oaxaca state on Friday, is part of a government effort to strengthen access to the justice system for the country's 10 million Indians.

The initiative comes as Zapatista rebel leaders, who led an armed uprising in January 1994, are in the middle of a 12-state trek to Mexico City to press Congress for an Indian Rights bill.

"We want to avoid (a situation) where Mexicans remain in jail because of their poverty and not their crimes," said Carlos Slim, president of Telmex parent Grupo Carso.

Under the plan, Telmex would pay fines and provide bail bonds so that indigenous activists can be released. Slim added that the program would start with some 200 bail bonds financed by the Telmex Foundation.

The National Indigenous Institute (INI) said they would seek the freedom of a range of jailed Indian activists under the plan, including environmentalists from Guerrero state and Zapatista sympathizers in

MEXICO: Mexico launches bail-bond program for Indians

Chiapas.

"We are particularly interested in (freeing) Zapatista prisoners as this would contribute to the peace process," said INI justice director Francisco Lopez.

"We want to play an intermediary role so that people who have been deprived of their freedom for defending social causes can win it back."

Major Mexican companies are increasingly associating themselves with social issues.



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## **Telmex , Avantel, and Alestra's Agreement**

A recent agreement also ended a four-year battle between Telmex, WorldCom and AT&T. Cofetel, the Commission Federal de Telecomunicaciones, has been trying to limit Telmex's authority but Telmex has been challenging its authority in court. Due to U.S. pressure from the U.S. Trade Representatives, the WTO, and threats of decreasing U.S. investment, Mexican parties have finally agreed to end their disputes. This agreement paves the way for further telecommunications growth in quality, value, and technology. The terms were generally fair for all parties. Telmex agreed to drop charges against Avantel and Alestra when the two carriers each agreed to pay Telmex over \$60 million to satisfy past due fee claims of the incumbent monopoly. The Mexican telecommunications king also agreed to charge both companies 75% of its lowest commercial rate to carry long-distance calls to remote areas in its 'last mile plan'. Telmex surrendered some rights to fees on incoming international traffic and allowed its competitors to handle a larger portion of incoming traffic. Rivals agreed to stop all illegal routing of international traffic which Telmex claims costs it millions of dollars per year. The implications of this agreement are huge. Avantel and Alestra will now be able to compete on a more level playing field and consumers of all kinds should benefit from lower prices and higher quality due to an actual choice among service providers. The Mexican telecom market as a whole will also have more freedom to work with foreign companies now that the market has regained stability.



Wired, January 2001

Yo Quiero Todo Bell – Jonathan Kandell

“Competitive carriers in Mexico have essentially been mugged by Telmex – which has used its monopoly position to maintain its stranglehold on Mexican consumers,’ a typical WorldCom statement claimed last spring.” (p. 128)

“The recent inauguration of Mexican president Vicente Fox, leader of the center-right National Action Party (PAN), offers a ray of hope. Fox’s election brings to an end seven decades of often-corrupt rule by the Institutional Revolutionary Party (PRI) – an era during which strong political connections were considered business as usual. As part of his platform of economic reform, Fox has promised to bolster relations with the US and sever the cozy ties between politicians and Mexico’s leading magnates. Making good on that pledge would likely mean butting heads with the magnate most closely identified with the PRI: Carlos Slim. .. Fox has made declarations that appear to be aimed at [Slim].” (p. 128)

Telmex accounts for almost 25% of ‘La Bolsa’, and all of Slim’s possessions are almost half.

“With only 3 percent of Mexicans online, there’s enormous growth in providing Net access. To capitalize, Slim is using Prodigy, .. , which he now owns, to focus on the Spanish-speaking world.”(pg. 128)

“Slim purchased the biggest .. US computer retailer, ComUSA, and a month later he launched ... a joint venture between Telmex and Microsoft called T1msn ([www.t1msn.com](http://www.t1msn.com)).” (p. 128)

“Getting Mexicans online hasn’t been as easy as making Prodigy bilingual, though. ... computer costs are a significant barrier to the rapid growth of Net access. Another impediment has been the dearth of consumer credit – most Mexican banks are still recovering from catastrophic loan defaults suffered in the December 1994 economic depression .. So Slim cobbled together a deal under which subscribers agree to buy PCs – Acer, Apple, and Compaq – from Telmex at fixed interest rates and receive Prodigy for free. ... has generated the sale of some 70,000 computers” (p. 130)

Todito.com also adopted a similar strategy. IDC stated that computer sales rose 29% in the first quarter of 2000 than in the first quarter of 1999.

“Slim hasn’t hesitated to play hardball to preserve his advantage, and such is the root of complaints

coming from the American telcos. WorldCom alleges that Telmex's interconnection rates – the fees rivals must pay to use Telmex trunk lines – are several times higher than .. in Europe and the US. ... Telmex will often claim there's too much traffic and suspend links for rivals ... Telmex has suspended service to .. Alestra and Avantel .. claiming they owe more than half a billion dollars for unpaid connection charges ... Telmex offers special promotions to long distance customers at rates below what it charges rival carriers.” (p. 134)

“‘Telmex is just one big constant violation,’ fumes an official at Avantel. ‘And they have neutralized the regulatory agency, Cofotel.’ ... there is no tradition of strong independent regulatory agencies in Mexico, and the judicial system is notoriously vulnerable to economic and political influence – making Cofotel, Mexico's FCC, a sorry mismatch for someone as powerful as Slim. ... ‘For Telmex ... time is golden.’” (p. 134)

“Terra Networks, (already the second-largest Mexican ISP), StarMedia Network, and Todito.com have all offered unlimited free connections, collecting revenue from advertising and ecommerce.” (p. 138)

“There's also the question of Slim's longevity. He has a heart condition and a family history of relatively early deaths. When he underwent heart surgery in 1997, rumors that he was near death caused the Bolsa to plummet.” (p. 138)

# Market Overview, Telmex's dominance in Telecom and ISP markets, and recent regulatory developments to increase future competition.

## INTERNET MARKET

Jupiter projects that almost eight million Mexicans will be online by the end of 2003, and that the figure will rise to nearly 13 million in 2005—roughly a tenfold growth in six years. (See Figure 8.) Despite the anticipated explosive growth, however, only 11 percent of Mexico's residents will be online in 2005, or about one in every nine people.

This relatively low online penetration can be attributed in part to underlying economic conditions: While Mexico is the second-largest economy in Latin America, average consumption (about \$3,500 GDP per capita in 1998) is markedly lower than Argentina and Chile, and only slightly higher than in Brazil. Unlike Brazil, though, Mexico does not yet support a richly competitive access market to speed online adoption among its middle and wealthy classes.

### TELMEX DOMINANCE OF TELECOM AND ISP MARKETS

Telefonos de Mexico S.A. de C.V.'s (NYSE Ticker: TMX) is the leading provider of telecommunication services in Mexico and is headquartered in Mexico City.

Since being privatized more than 10 years ago, Telmex has made substantial improvements in its business infrastructure and has well positioned itself for a competitive market place. Since 1991, the company has more than doubled its lines in service from 5.3 million to 11.8 million, reduced the two-year wait for fixed-line access, invested heavily in a 42,000 mile fiber optic network that covers virtually the entire country, and has fully digitized its network. It has been actively involved in purchasing companies to increase its vertical integration as well. Management continues to pursue a 'makes-sense' strategy that is designed to improve customer service and efficiency, increase value-added

digital service penetration (i.e., voice mail, caller ID, call waiting), expand and reinforce its fiber network, and invest and integrate its existing infrastructure architecture to provide voice, data, internet and video under a common infrastructure.

Telmex holds leading market positions in fixed-line local exchange (95% market share), long distance (66%), data and Internet services (56%). The company's incumbent market position should enable the company operate in an increasingly competitive environment, and benefits from strong fundamentals in its core markets. Telmex's integrated telecommunications business includes a significant level of cash flow from its lower risk, fixed-line local exchange business, which lowers cash flow volatility and business risk. The company's strong cash flow and reasonable debt structure should provide ample cushion to satisfactorily meet all of its debt service requirements on a timely basis.

Sector fundamentals remain strong. Telecommunication penetration rates in Mexico continue to grow but remain low. From 1991 to 1999, local, domestic long distance, and international long distance per capita usage have increased from 339 to 930 minutes, 54 to 145 minutes and 16 to 69 minutes, respectively. Telecommunication growth rates continue to be supported by structural reforms that continue to drive economic growth in Mexico. The operating environment also benefits by the demand for data and Internet access services. These new services have been expanding at very rapid rates, which are expected to continue over the next few years.

Mexico holds an important advantage over major markets to the south in that local telephone calls are not metered. Instead, Telmex customers pay a monthly service fee that includes the first 100 calls each month and a charge of about \$0.14 for each additional call, regardless of the duration. (Telmex recently proposed—but quickly abandoned—plans to switch to metered pricing, after critics charged the move would stifle Internet use.) However, despite official reforms in Mexico, competition in basic telecommunications exists in name only for the most part. Both MCI Worldcom and AT&T offer long distance and international service in Mexico (through subsidiaries Avantel and Alestra, respectively); as of January 1999, three companies other than Telmex offered local service—in very limited areas. Telmex dominates both local and long distance markets, controlling almost all of the approximately 11 million phone lines in Mexico. Telmex wields its power competitively, for instance, competitors accuse the incumbent PTO of denying them access to high-speed lines needed to offer voice and data services. Meanwhile, Mexico's telecommunications regulatory agency, Cofetel, has been unable to impose the official guidelines it developed to control how Telmex, as the dominant carrier, charges competitors for use of its network.

Telmex's dominance in telecom spills over into the emerging access markets for both business and consumers. According to Cofetel, 11 states in Mexico harbor 30 or more ISPs, while Mexico City alone holds nearly 100 (estimates that do not account for the many tiny ISPs that launch and disappear each month). Still, Telmex's roughly 350,000 dial-up subscribers account for more than half of dial-up accounts in the country. (In 1999, Telmex consolidated customers of its ISP into the Mexican version of

Prodigy. Prodigy is jointly owned by Telmex, its parent Carso Global Telecom, and US-based SBC.) The next biggest ISP, Infosel, claimed only about 65,000 dial-up subscribers as of January 2000.

The state of access competition in Mexico is reflected in the comments of leading challengers to Telmex, many of which claim that the telecom giant unfairly stifles competition. Complaints range from charges that Telmex inflates its subscriber numbers by including trial accounts and users it has never billed, to the widespread accusation that the carrier intentionally disconnects local calls after 20 minutes to boost its revenues.

Telmex faces numerous challenges, as the Mexican telecommunications market becomes increasingly complex and competitive. In 1997, the Mexican long distance market was open to competition and 18 carriers were granted licenses, of which nine companies have established operations. Competition has resulted in a market share loss of approximately 34% to Telmex (primarily to two carriers that are backed by international telecommunication providers), lower international settlement rates and lower interconnection fees. Continued competition in the long distance segment

is expected to further modestly pressure operating margins and result in further modest losses in market share over the medium term.

Consumer access costs remain substantially higher in Mexico than in other parts of Latin America—most notably Argentina and Brazil, where brand-name access is available for about \$10 per month (not counting metered phone charges). Leading Mexican ISPs, on the other hand, all charge between \$20 and \$25 per month for unlimited access; Telmex's \$20-per-month fee is the least expensive of all the major providers. Unmetered access accounts for this price premium: Mexican ISPs do not have to compensate for metered phone charges, which can easily add \$20 or \$30 to consumers' final bill. Conversely, ISPs in South America know that per-minute charges shorten average session times, easing equipment and bandwidth burdens on the access provider.

Despite those differences, most analysts expect ISP charges to drop substantially in Mexico over the next 12 months as competitors cut prices to challenge Telmex and as more free ISPs enter the market. As of January 2000, only Libertis offered free access in Mexico; meanwhile the regional ISP IFX/Unete was preparing to move to the free model. Jupiter notes that Telmex's reputation among consumers is often as poor as it is among competing ISPs. A real opportunity exists in Mexico for a well-funded ISP challenger to eat into Telmex's share and even assume leadership with a heavily marketed approach that emphasizes lower prices, consumer friendliness, and access via multiple platforms.

However, competitors equipped to launch such a campaign against Telmex are not easily found in Mexico. Grupo Televisa, the reigning broadcast and print leader of the Spanish-speaking world, has a natural advantage in supplying content for and driving traffic to its still undisclosed Internet play. The company's primary access asset, a cable company, is co-owned with Telmex but Televisa also holds

satellite properties that could deliver Internet access. TV Azteca, another potential Telmex challenger, currently limits its Internet strategy to a promotional partnership with portal and ISP Todito.com. Telmex's access reign will probably remain uncontested until one of these media powers—or an international contender such as AOL—implements an aggressive Internet strategy in Mexico.

Recent establishment of dominant carrier regulations by industry regulator, Cofetel, and increasing pressure from the WTO somewhat adds to uncertainty and may further accelerate competitive forces. Telmex is currently challenging these new regulations with an uncertain outcome. However, despite these challenges, Telmex is well positioned to compete and maintain its market position over the near to medium term.

## MEXICAN REGULATORY AGREEMENTS

Telmex, Mexico's dominant telephone carrier, and its principal long-distance rivals signed a landmark accord yesterday that is expected to end years of bitter legal wrangles and open up the country's \$12bn (GBP8bn) telecommunications market to greater competition.

Avantel and Alestra, the Mexican companies part-owned by US carriers MCI WorldCom and AT&T respectively, agreed to pay Telmex some \$137m in unpaid fees. The three companies also said they would drop dozens of lawsuits paralysing the industry since it was opened to competition in 1997. "This agreement resolves all the disagreements of the past that constituted a barrier to the modernisation of our telecommunications market," said Roland Zubiran, president of Alestra. "This is a watershed in the history of telecommunications competition in Mexico." Pedro Cerisola, Mexico's telecoms minister, denied the agreement was aimed at defusing a US bid to seek World Trade Organisation arbitration over alleged trade barriers in Mexico's telecoms industry. But, according to Telmex officials, the accord is likely to resolve most US concerns.

For years Avantel and Alestra have complained that Telmex's near monopoly of the market and the unfair use of its dominant position has made it impossible to compete. In 1998 Mexico's antitrust agency declared Telmex dominant in five markets including local and long-distance services but rules regulating its dominant position have been blocked by Telmex in court. Under the new agreement, Telmex will not challenge a government decision to reduce the fees Telmex's rivals pay to complete calls on its network. The carrier also agreed to provide Alestra and Avantel with connections and digital trunking that the two companies say they had been denied.

The three carriers also began talks this week in New York with US carriers over the new interconnection rate for calls between the US and Mexico. According to Telmex officials, the current rate of 19 cents a minute - considered high by international standards - will probably be reduced. The US administration said it was encouraged by the deal but would not immediately withdraw its WTO case. The pact "seems

to have resolved most but not all of the issues", said a US official, citing in particular the problem of high international connection rates.

## AVANTEL CHALLENGES

Avantel, a Mexican telecom company partly owned by WorldCom Inc., plans to spend \$ 200 million this year to move into the local phone market after reaching agreement with Telefonos de Mexico on interconnection fees. Avantel agreed with Telmex in December to set the connection fee between networks at 1.25 cents a minute, down from 3.36 cents a minute last year. The reduction allows Avantel to offer lower rates to customers in its long battle to wrest market share from Telmex, the former state monopoly. In addition, Avantel's circular network design has is less vulnerable than Telmex's star design and has a safer and faster record in the last five years. Five years after long-distance service was opened to competition, however, Telmex still controls about 70% of the market.

Last December, Telmex, Avantel and Alestra SA, another long-distance competitor, finally struck a deal on interconnection fees, cutting Telmex's per-call charge by 63 percent and ending years of litigation. Competitors no longer need to bypass Telmex to have hopes for a profit.

But while the change makes competing in local residential service more feasible, it does not make it a priority. Avantel, jointly owned by Banamex Accival SA, the country's largest bank, with a 55 percent stake, and WorldCom Inc., the U.S. telecommunications giant, with a 45 percent stake, already offers long-distance and data services to many large corporations. Avantel has said it would focus first on retaining its market share among businesses, with a move into residential services more likely next year.

Avantel's director of local service, Javier Vieyra, said that the company would invest \$200 million this year, with a target of 10 percent to 20 percent of the business market by year's end. Mr. Vieyra also said that Avantel would start service in Monterrey and Guadalajara in February. The story is similar at Alestra, 49 percent-owned by AT&T Corp., which said that it too expected to offer local services in Mexico City, Guadalajara

and Monterrey.

## U.S. RATE CHALLENGES

Telmex executives are currently holding negotiations on the settlement fee in New York. A top Telmex executive said they would try to keep the

current level, and that further advances could bring larger rewards to the new administration of President

Vicente Fox in the form of increased foreign

investment. The deal also did not address all the issues that the U.S. brought before the WTO regarding Mexico's noncompliance with its 1997 WTO commitment to facilitate competition in its telecom market, according to a U.S. trade official.

Lingering international issues involve existing Mexican laws on

international interconnection fees, known as settlement rates. According to its laws, all international calls coming into Mexico must be subjected to a uniform settlement rate system. One key U.S. concern is that Mexican law stipulates that Telmex, as Mexico's

largest carrier, is the sole negotiator of settlement rates. With no competitive alternative to the current 19 cents settlement rate, Telmex has no incentive to reduce it. The U.S. complaint to the WTO seeks a change in Mexican law so a settlement rate can be negotiated that would reflect actual costs.

"The United States welcomes the progress that's been made in Mexico

but is looking to see what Mexico is going to do with respect to reforming its international services rules, which currently prevent competitive alternatives to the termination of international traffic in Mexico," the trade official said. "We are looking to see how Mexico intends to enforce its competitive safeguards against Telmex

in Mexico."

Enforcement has been difficult for Cofetel, Mexico's telecom regulatory body. A problem for U.S. and Mexican governments is that Cofetel has little control over Telmex. The dominant carrier thwarted Cofetel's initial regulatory efforts by challenging its regulations in Mexican courts, arguing that the regulatory body was acting

outside the scope of its legislative authority. Despite Cofetel's uphill struggle during the past three years, the recently agreed upon domestic interconnection fee is a Cofetel-established rate - a positive sign for Cofetel's future dealings with Telmex, said Rudy Baca, global telecom strategist for The Precursor Group.

"Fox wants to bring foreign investment to Mexico, and telecommunications has been a big-ticket industry," Mr. Fisher said. "Bringing competition to the Mexican telecom market would send a huge message to the rest of the world."



# Telmex Overview

- Telmex is a world-class telecommunications company that provides total telecommunications solutions to its clients
- Currently positioned as regional market leader in telecommunications with a presence in Mexico, The United States, Guatemala, Puerto Rico, and Brazil.
- With the participation of Carso Global Telecom, France Telecom and Southwestern Bell, Telmex is positioned to control the future as well
- Revenues last 12 months: 11,241,000,000, Profit last 12 months: 2,672,600,000
- Margin: 24%
- Over 63,000 employees in 373 branches

## Established Partnerships and Subsidiaries

- Several strategic alliances and subsidiaries to continually expand
- 49% stake in Empresas Cablevision SA de CV, 19% stake in Prodigy Communications Corp, a 50% stake in SBC International Puerto Rico Inc.

- Multiple fully owned subsidiaries include:
  - Anuncios en Directorios (ADSA)- Over 70 years experience in creating Yellow Pages, advertisements in every directory in the world
  - Red Uno- a leader in providing voice, data and video solutions for the corporate market
  - Telnor- provides telecommunications services in the state of Baja California and Sonora
  - Telcel- TELMEX's wireless division
  - Uninet- supports the Telmex data network with maximum security and quality
  - Telbip- provides paging services in 33 cities and 500 towns in Mexico
  - Kb/TEL-specializes in wireless data-network technology
- Recent partnerships with Tut Systems, Inc. to offer high-speed internet service in hotels throughout Mexico
- February 7, 2001, Telmex spun off its mobile communications arm, America Movil,
  - Assets bundled in America Movil had operating revenues of 19.15bn pesos (\$2bn) in the first nine months of 2000.
  - Cellular subscribers in Mexico, its largest market, have quadrupled since 1998, to almost 12m, of which it had almost 9m last September

# Company Overview of Avantel

- Avantel telecommunications has served customers with cutting edge data transmission technology since 1997
- Avantel has made investments of over \$2 billion and has over 2,000 employees
- Avantel is committed to consumer satisfaction
- Avantel is a joint venture between Grupo Financiero Banamex-Accival (55%) and MCIWorldcom (45%)
- This alliance which blends immense resources and expertise in identifying opportunities
- WorldCom's strategy focuses on investments in high growth areas such as data/Internet transmission services and local and international communications services
- Avantel is a first mover in telecommunications technology and is aggressively competing to take advantage of the huge forecast growth in Mexico
- Avantel currently seeks to capture 35% of the telecommunications market in the next couple of years

# Products

- Avantel has recently introduced packet services, a private voice and data network based on digital standards
- Includes private line, fax service, and products such as Internet access and frame relay
- In August 1999, Avantel obtained a local service permit and launched Avantel Local to provide local telephone service early in 2000
- On January 19, 2001, Avantel announced the beginning of local telephone service in the Federal District and Conurbadas zones
- Monterrey and Guadalajara by February
- With Avantel Internet consumers receive an email account with 5 Mb of capacity or 5Mb of space for a personal web page, both with unlimited use

# Infrastructure

- Avantel initially invested \$1 billion in network infrastructure and is spending an additional \$1.2 billion over the next four years
- A \$650 million project is constructing a fiber optic network around Guadalajara, Monterrey, and Mexico City, Mexico's three largest cities (75% traffic).
- Avantel's 6,300 km optical fiber network allows hundreds of thousands of clients to communicate

to any place in Mexico and more than 280 countries in the world

- Four Intelligent Power Stations, two Customer Service Centers, and a Network Monitoring Center provide increased customer attention and network security
- Avantel's internet backbone reaches speeds of more than 1.000 Mbps with 99.98% reliability.

## Operations

- Four-year legal battle between Telmex, WorldCom and AT&T ended recently
- Telmex agreed to drop charges against Avantel and Alestra when the two carriers each agreed to pay Telmex over \$60 million to satisfy past due fees
- The Mexican telecommunications king also agreed to charge both companies 75% of its lowest commercial rate to carry long-distance calls to remote areas in its 'last mile plan'
- Telmex surrendered some rights to fees on incoming international traffic and allowed its competitors to handle a larger portion of incoming traffic.
- Rivals agreed to stop all illegal routing of international traffic which Telmex claims costs it millions of dollars per year.



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## **President Fox and Federal Telecommunications**

The new Mexican government hopes to improve internet access in the country by increasing the number of telephone lines.

The Fox government wants to make telephones a basic service like electricity, doubling the number of phone lines within five years, President-elect Vicente Fox's top telecommunications adviser said.

In an interview on Thursday, the adviser, Emilio Goicoechea, a lawmaker who is secretary of the telecommunications committee in the lower house of Congress, said the Fox administration planned to foster investment with reforms to the federal telecommunications law.

Part of the vision is to make the Internet, as well as telephones, a basic service and to turn post offices nationwide into complete communications centers with public computers, he said.

With only 11 telephone lines per 100 people, Mexico has the lowest proportion of lines among Latin America's big economies. In some rural states like Chiapas in the south there are only 3 lines per 100 people, less than in very poor countries like neighboring Guatemala. "We are talking about doubling the current infrastructure in five years," Mr. Goicoechea said, "going to 25 lines per 100. A benchmark cost per line is about \$1,000. Multiply that by 13 million lines, and that gives you \$13 billion" in investment needed.

"Even with penetration of 25 percent, we'd still be below the international benchmark," he said. Industry analysts and insiders often blame Mexico's relatively slow growth in phone lines on a lack of competition because of the market dominance of the former state-owned monopoly Telefonos de Mexico, or Telmex, privatized 10 years ago.

**The Mexican dot-com community is giddy over newly elected President Vicente Fox. His ambitious economic goals--heavy on deregulation and foreign investment--could jumpstart the moribund Mexican Internet sector. Substantial legacy obstacles remain, however.**

It might take awhile for Sergio Rosengaus to get acclimated to the economic excitement currently enveloping his hometown of Mexico City. In the last two months, Rosengaus, the founder of dot-com startup accelerator [NCubo](#), has witnessed a surge in the hopes of Mexican dot-commers following the landmark victory in July's presidential election by Vicente Fox Quesada, the 58-year-old former [Coca-Cola](#) ([KO,info](#)) executive.

"The calm transition has immediately changed the state of mind of foreign investors and raised consumer confidence," says Rosengaus.

Fox's pledge of a seven-percent economic growth rate through deregulation and foreign investment was key to his electoral victory. It's a colossal task, to be sure, but several foreign venture capital firms appear up for the challenge.

Recently, scores of U.S. and European venture capital firms have set up shop in Mexico to help foreign-based businesses launch Latin American operations. UK-based [Antfactory](#), for example, the year-old Internet incubator fund, recently struck a deal with CVC Latin America, the VC arm of [Citigroup \(C,info\)](#), to invest in startups in the region and provide local staff to foreign companies. The firms announced that they expect to spend \$100 million in the region in the next 18 months.

The Mexican startup community is almost entirely dependent on this type of influx of foreign investment, says Rosengaus, because of the legal restrictions in getting capital from the public markets. Mexican law requires all companies that want to go public to prove that they've been profitable for at least two years. Lack of funding is the most significant obstacle to developing a thriving Internet business community, he says.

"If your company launched six months ago, how can you show profits for the last two years? In the U.S., there were some companies that didn't even have any revenue at all and they were coming out with IPOs," says Rosengaus. "Some of the businesses here are built on models that have been proven in the U.S., and they will eventually become profitable. But they require some capital to do so, and if you don't have a public market to finance, then what are your options?"

Grant Smith, a senior analyst with [The Yankee Group](#), says the lack of public market funds isn't the only obstacle facing Mexican startups. "The big [Mexican] banks basically don't lend to anyone but the biggest and strongest companies, and you don't see a lot of very big pools of capital."

Fox hasn't formally committed to modifying the law, but most analysts expect him to do everything in his power to open up the flow of capital to small- and mid-sized businesses.

For now, Fox has more pressing matters to attend to. His pledge to deregulate the telecommunications industry--namely, loosening Telefonos de Mexico's (TelMex) tight grip on the rollout of broadband services in Mexico--suffered a setback in early August when the Clinton administration filed a [World Trade Organization](#) grievance against Mexico. The charge? Essentially not acting fast enough in opening its telecom sector to the Mexican affiliates of U.S. giants like AT&T and WorldCom.

Rosengaus believes that until the deregulation occurs, the number of Mexican Internet users will remain at its paltry level, currently 1.3 million, or less than three percent of the adult population, according to [eMarketer's May 2000 eLatin America Report](#). eMarketer predicts online users in Mexico will reach 2.89 million by 2003.

Rather than sit back and wait for the market to evolve, many Mexican dot-com companies have started looking outside of Mexico for their customer base. A typical path involves establishing operations in Miami, getting funding from U.S. venture capital firms, and positioning themselves as a pan-regional Latin American player, says Smith.

"Most of the domestic startup projects I've come into contact with usually had a group of angel investors and were on their way to Miami to look for some real money," says Smith, who recently spent a week with Mexican Web hosting and ecommerce development companies.

Such a strategy introduces many logistical barriers, however, such as high tariffs on goods from certain countries, says Rosengaus. "We will eventually need local fulfillment for everything, and there is no clear cross-border agreement right now," he says. "[Many Mexican dot-com companies end up establishing] a new business in each of the countries where [they] want to make inroads."

### **Telmex and the WTO**

According to Los Angeles Time writer Chris Kraul the U.S. has filed a WTO complaint against Mexico's TELMEX.

Frustrated by "barriers to competition" keeping WorldCom Inc., AT&T Corp. and other carriers from fair access to **Mexico's** \$ 12-billion long-distance market, the United States said Friday that it will ask the World Trade Organization to intervene.

The announcement followed a breakdown in talks in **Mexico** City this week between the Mexican government and the U.S. trade representative's office.

To be filed next week in Geneva, the complaint against Telmex, the former Mexican national telephone monopoly, will seek WTO mediation or, if that fails after 60 days, binding sanctions.

Shares of Telmex traded over the New York Stock Exchange dropped \$ 2.56 to close at \$ 50.94 on Friday. The stock also tumbled last week on disappointing second-quarter earnings, which Telmex blamed partly on long-distance competition, including so-called illegal bypass operators.

U.S. trade officials contend that Telmex charges excessive access fees on calls originated by competing carriers within and outside Mexico. Those fees "adversely affect U.S. interests and deprive Mexican citizens of the benefits of



competition," U.S. Trade Representative Charlene Barshefsky said in a statement.

Telmex access fees can range between 3 cents and 4.5 cents a minute for domestic long-distance calls and as high as 19 cents a minute for long-distance calls originated outside Mexico, according to the trade representative. Those rates are two to three times the rates charged by most countries.

The high rates are discouraging investment in Mexico's **Internet** services and electronic commerce, Barshefsky said, and hobbling efforts to expand Mexico's relatively sparse telephone service.

Mexico's "teledensity"--phone lines per 100 people--is just 11%, trailing those of most other Latin American countries. Mexico has nearly as many mobile phones as fixed lines, said Bryan Prohm, senior analyst with Gartner/Dataquest in Raleigh, N.C.

Telmex contends that it has already lowered rates dramatically, and that the U.S. complaint is based on false information.

In a teleconference call to reporters from Mexico City, Telmex spokesman Arturo Elias Ayub said the company welcomed the U.S. challenge as an "opportunity to take the story of the opening of telecommunications in Mexico to an international level. We are confident that the opening is more than adequate."

In disagreement are WorldCom and AT&T, which have each invested hundreds of millions of dollars in Mexican long-distance carriers to compete with Telmex, but whose rates can't come close.

Both Avantel, the WorldCom partner in Mexico, and Alestra, the AT&T ally, have withheld payment of millions of dollars in access fees to Telmex in protest.

AT&T and other foreign carriers contend that lowered access fees would prompt such an increase in the volume of calls that Telmex wouldn't suffer any decline in revenue.

As it is, Telmex concedes that its high rates are costing it as much as \$ 200 million a year in long-distance revenue to the bypass long-distance carriers, which use **Internet** technology to move international calls over data transmission lines.

Mexican President-elect **Vicente Fox** has said since winning the July 2 election that he favors opening up the country's telecommunications industry to more competition and investment.

But any change could be slow in coming, said Gartner/Dataquest analyst Marta

Kindya in Stamford, Conn. Telmex's dominance is in part a reflection of the fact that "Telmex is a popular company, the No. 1 stock in Mexico in market value, and there are lots of vested interests to maintain the status quo."



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## TELMEX and the U.S.

**The U.S. fined TELMEX last January, because the fees charged to its competitors in Mexico were not compatible with the agency's terms for Telmex to do business in the United States. Please see, <http://www.ntgts.org/news/landers.htm>.**

Internet use is spreading rapidly through Latin America, but Mexican consumers and some others could lag behind because investors are discouraged by weak regulation of powerful phone companies. Several U.S. telecommunications companies, analysts and federal officials complain that Teléfonos de México SA, or Telmex, stifles competition. The former state-owned monopoly is now a private company with dozens of competitors for local and long-distance telephone service. Telmex still dominates the Mexican telecommunications market, however, and competitors are crying foul.

Telmex in turn accuses new entrants AT&T Corp. and WorldCom Inc. of cherry-picking its corporate customers without investing in infrastructure.

The two sides are caught up in lawsuits in Mexico and a trade dispute that has gone to both President Clinton and President Ernesto Zedillo.

Regulators have also been unable to untangle telecommunications in Bolivia, Costa Rica, Uruguay and Venezuela, where telephone monopolies or near-monopolies continue to collect high prices.

About 16 million Latin Americans are now online – about 3.2 percent of the region's 500 million population. The rate is doubling annually, and Spanish has become the second language of the Internet after English.

Without big investments in telecommunications, however, growth could hit a wall. And some investors say they will shy away if they don't have the opportunity to compete.

"The moment's here, ripe to be taken," said Cresencio Arcos, regional vice president for Latin America with AT&T Corp. "There is a concern, though, that only a handful of Latin American countries are going to make the right public policy decisions because Internet technologies challenge the existing powers and their exorbitant, non-cost-based rents."

From the U.S. perspective, Mexico is the country of greatest concern. Officials warned last month that the United States might sue Mexico before the World Trade Organization because it has not opened its telecommunications market adequately to foreign competition. The Clinton administration has set a Friday

deadline for Mexico to act.

A similar threat against Japan was resolved last week when the government-controlled local telephone monopoly NTT agreed to cut in half the fees it charges foreign companies to use its circuits.

### **Competition founders**

Some analysts blame a lack of competition for high prices in Mexico. Mexican consumers pay nearly four times as much as U.S. consumers for a basket of telecommunications services, according to a February study by the Alexis de Tocqueville Institution, a nonpartisan research group based in Arlington, Va.

The basket of 2,000 minutes a month of local calls, national and international long-distance and unlimited Internet access was priced in the study at just under \$45 in the United States. The Mexico price for the same basket was more than \$160. Bolivia had the highest-priced basket in the study: \$302.

The Organization for Economic Cooperation and Development, which represents 29 of the world's wealthier nations, last year found Mexico's phone charges were twice the organization average. Meanwhile, the number of telephone lines for every 100 people in Mexico is among the lowest in Latin America. Daniel E. Crawford, ventures president for WorldCom, faults Telmex for the high prices and poor service. And he says there's much more at stake than a squabble between giant telecommunications firms.

"Telecommunications is a springboard for a mammoth rollout of the Internet all across the world," Mr. Crawford said. "For the economies of Latin America, telecommunications is the heartland of business today."

Telmex general counsel Javier Mondragon faults WorldCom and AT&T for raising long-distance prices in Mexico and slowing telecommunications investment.

"If there is something that could stop telecommunications investment in Latin America, it is the long-distance carriers' behavior," he said. "They want others to do the investments, while they want the cream of the customers."

At present, Internet providers are multiplying throughout Latin America, and prices are falling. Mexicans can get unlimited Internet access for \$18 a month, the de Tocqueville Institution study found. But U.S. telecommunications firms complain that Telmex won't supply circuits for dial-up Internet access when they ask for them.

Jorge Nicolás, president of Mexico's Federal Telecommunications Commission or Cofetel, said Telmex is reluctant to give lines to companies that have not paid millions of dollars owed for long-distance interconnections. The U.S. companies say those payments have been suspended by the courts while they hear arguments that the rates were designed to price Telmex's competitors out of the market.

Telmex is one of the biggest firms in Latin America and one of the most

profitable. The Mexican government in 1990 sold majority ownership for \$1.76 billion to a group led by Carlos Slim Helu's Grupo Carso. San Antonio-based SBC Communications Inc. holds 10 percent. In 1999, Telmex reported earnings before extraordinary items of \$2.6 billion on sales of \$10.05 billion.

### **Contract disputes**

U.S. firms argue that under World Trade Organization rules for telecommunications trade, Telmex should make its circuits available to foreign competitors for a cost-based fee. Mr. Arcos said Telmex is charging its foreign competitors 19 cents a minute for circuit access that costs Telmex only 6 cents a minute.

Mr. Mondragon disputed those figures and said the big U.S. firms were avoiding their contractual obligations. The FCC fined Telmex \$100,000 in January because the fees charged to its competitors in Mexico were not compatible with the agency's terms for Telmex to do business in the United States.

As U.S. trade officials see it, the problem is a weak referee. Mexico's Federal Telecommunications Commission has struggled for years to compel Telmex to change to a cost-based fee structure and to provide more circuits to competitors. Telmex has used the courts to keep Cofetel at bay, winning more than 200 injunctions against the regulatory agency.

"Telmex is a telephone monopoly that is not regulated the way it should be regulated," said Deputy U.S. Trade Representative Richard Fisher. "Telmex needs to be fiercely regulated." Mr. Nicolás said Mexico has made progress on all the issues that U.S. officials are raising. Competitors now hold 30 percent of the long-distance market. Cofetel is hearing Telmex's arguments about dominant carrier rules proposed on March 27, but meanwhile the company has promised to provide new lines for Internet providers on a first-come, first-served basis, Mr. Nicolás said.

"We are one of the three countries with the fastest growth of the Internet," he said. "Most of the problems are from the impressive growth of the Internet in Mexico."

President-elect Vicente Fox has said he will ensure that Cofetel has both the autonomy and authority to regulate Mexico's telecommunications companies. But Mr. Nicolás said one of the problems – filing for injunctions – needs legislative action.

"It is easy to get injunctions. This is a problem we face not only from Telmex but the rest of the carriers as well," he said.

Legislation limiting injunctive relief has been introduced in Mexico's Congress.

Mr. Fisher was scheduled to meet Monday and Tuesday with Mexican officials in Mexico City. The meetings probably will decide whether the United States lodges a WTO complaint against Mexico.

"Sometimes, both people think they are right, and when both people think they are right, they get stubborn," Mr. Mondragon said. "You need something or someone to break the stalemate. I hope Mr. Nicolás will help us."

### **Other markets lauded**

In contrast to the fight in Mexico, FCC Chairman William Kennard last March lauded the efforts of Peru, Jamaica, Argentina and Brazil to open their markets and promised technical support to their regulators.

Argentine President Fernando de la Rúa took office in January vowing to bring competition into telecommunications. By March, long-distance prices were down 56 percent. Competition has forced prices down for Internet access as well.

Consumers in Argentina and Chile pay less than \$15 for unlimited Internet access, the de Tocqueville Institution found. But in Costa Rica, where the government has maintained an Internet service monopoly, the cost of unlimited Internet access last year was \$95 a month.

While surfing the World Wide Web and trading e-mail are the most popular Internet pastimes today, the Internet also offers consumers a way to make telephone calls and send faxes at little or no cost.

Rob Stephens, director of Latin American business development with Internet telephone service provider iBasis Inc., remembers a conference in Brazil where the speaker's description of the future of the Internet brought one applause after another – until he said it would drive telephone call charges to zero.

"That line brought dead silence," Mr. Stephens said. "The big incumbent telecoms are all pro-Internet when it generates more revenues. But when it challenges the notion that you have to pay for telephone service, they feel threatened by it."

Ecuador and Colombia have effectively banned using the Internet to make telephone calls, Mr. Stephens said.

"In Europe and Asia, it's very easy to get these licenses," Mr. Stephens said. "Asian countries are worried about content. Latin American countries could give a flying hoot about content. Their concern is how it will affect the underlying companies."

Mr. Stephens' firm entered the Mexico market in April with long-distance provider Operadora Protel SA, a Telmex competitor in the commercial long-distance market in 51 Mexican cities. The partners are now routing long-distance telephone calls over the Internet rather than through more costly telephone switches.

The Internet will become a highway for voice traffic only if Latin America invests heavily in high-speed connections known as broadband, Mr. Kennard said in Peru earlier this year.

"To create ubiquitous broadband, we must create transparent, effective

regulatory regimes that ensure full competition," he said. "This inevitably means that regulators must curb the power of powerful incumbent carriers to create a level playing field for new entrants."

**By Jim Landers / The Dallas Morning News**



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## **President Fox and the WTO dispute**

The United States still wants to work with new Mexican President Vicente Fox to resolve a telecommunications dispute, despite requesting a World Trade Organization panel to review the matter, a top U.S. trade official said on Tuesday. At a briefing with foreign reporters, U.S. Trade Representative Charlene Barshefsky said she discussed the dispute on Monday with new Mexico trade minister Luis Ernesto Derbez and the two would talk again later this week. "We had very constructive discussions," Barshefsky said. "Our hope is, of course, to work with them because resolving these issues in a manner consistent with the WTO would be in Mexico's interest." Earlier on Tuesday the United States asked the WTO in Geneva to form a dispute settlement panel to investigate its complaint against Mexico. That move was immediately blocked by Mexico, as is allowed under WTO procedures, thereby delaying the formation of a panel until early next year. The United States charges that Mexico's telecommunications giant, Telmex, [TELMEXL.MX] uses its dominant position to keep out competitors. It also says that fees charged by Telmex for connecting calls from outside the country are too high and violate the terms of a 1995 WTO agreement. If the United States renews its request at next regular meeting of the WTO's Dispute Settlement Body (DSB) on February 1, a three-member panel would be immediately set up and given six months to report. "We do want to work with Mexico to try and resolve the issue," Barshefsky said. "But failing a resolution, we will continue to pursue our WTO rights."

WASHINGTON, Dec 12 (Reuters)

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General Education, Big Picture

*Background Information*

This information is taken from [www.inegi.gob.mx](http://www.inegi.gob.mx) and includes basic literacy and enrollment information for elementary and secondary schools in Mexico.

### **Literacy:**

- Nationally, 87.2% of children between the ages of six and fourteen are literate; more so in urban areas such as Mexico City (92.9%) and less so in urban areas such as Chiapas (76.6%).

- For those above the age of 15, a total of 90.3% are literate (92% male, 88% female); 96% of people under 30 and a mere 64% of people above 65.

### **Drop Out Information:**

- The average child in Mexico gets 7.7 years of education (up from 2.8 in 1960)

- Large disparity between the rich and the poor. The poorest 10% of the population would get only 2.1 years of education, while the richest 10% would get 12.1 years.

### **Enrollment:**

- 14,808,300 students are enrolled in elementary education
- 5,084,000 students are enrolled in secondary school
- 95% of children aged six to nine are enrolled in school
- 90% of children aged ten to fourteen are enrolled in school
- 46.7% of children aged fifteen to nineteen are enrolled in school

### **Internet Usage:**

- Educational use of the Internet accounts for 20% of total usage in Mexico

# Educational Programs

*Information on these programs is taken from [www.sep.gob.mx](http://www.sep.gob.mx) and [www.ncpa.org/pi/internat/intdex11.html](http://www.ncpa.org/pi/internat/intdex11.html) and includes information on teacher training, programs to improve the educational system as a whole and how to keep children in school.*

## **Teacher Training:**

- The government has initiated a series of programs to maintain a certain level of teaching standards. The government sponsored events focus primarily on ensuring teaching is done in a productive manner. Technology is not oriented into this type of program.

## **Improving Educational System:**

- What priority is technology in the future of education in Mexico? Approximately 4% of the educational budget is spent on technology each year.
- Much of the improvement for education is focused on the urban areas, because that is where the majority of students go to school. This causes a gap to build between the level of education in urban vs. rural areas.
- There is no mention of technology in the educational standards printed by the Secretary of Education, so the issue is left up to the discretion of individual schools and their focus and is obviously also based on funding.

## **Keeping Children in School:**

- Pay poor mothers an incentive bonus if schools report that their children attend classes regularly.
- The payment should not be much less than what the children would earn if they worked.
- Since poor parents in some countries routinely withdraw their daughters from school when they become teenagers, payments should be a little more for daughters who continue their education.
- Funds could be siphoned off from universities which often receive a disproportionate level of funds available for education in poor nations.
- The Mexican government has initiated such a program, covering about two million very poor families, with payments of about \$25 per family -- in a country where most poor families earn only about \$100 a month.
- Reports say the Mexican program is highly successful. After only a couple of years in operation, it significantly raised the educational level of children in very poor areas. It has also narrowed the education gap between girls and boys and reduced the labor force participation of boys.

- Source: Gary S. Becker (University of Chicago and Hoover Institution), "'Bribe' Third World Parents to Keep their Kids in Schools," *Business Week*, November 22, 1999.

### **Using Technology and the Internet:**

- The Internet can serve as a tool for students to join together with students across the world. In Mexico City, one group of 14 schools has their Internet linked up with schools in the San Diego area. Students interact with peers across a border and therefore, have more of an incentive to practice their language skills.

## ***Elementary Schools***

The information for this portion of the project is taken primarily from [www.sep.gob.mx](http://www.sep.gob.mx) and includes background information and information about computers, technology and the Internet in elementary schools.

### **Background Information:**

- For the near fifteen million children enrolled in elementary education, there are nearly 100,000 schools and 550,000 teachers. Approximately 94% of these schools are public – either state or federal.
- Seven thousand pesos are spent on the average student yearly.

### **Technology and Internet**

- Information on specific cases with elementary schools and the Internet is difficult to find online because so few have Internet access
- However, the majority of schools that do have Internet are private and the three areas with the largest number of these schools are Guadalajara, Monterey and Mexico City.
- One example: The American School Foundation: [www.asf.edu.mx](http://www.asf.edu.mx)
  - o There are two computer labs in the Elementary School, which are staffed with full time teachers and equipped with IBM computers. All students in second through fifth grade have two classes per week. One class is devoted to learning such computer skills as keyboarding, word processing and LOGO, and the other class is used for didactic applications. First grade students use the lab for didactic applications. Classrooms also have a computer, which is used for research, enrichment, and remedial teaching.

# Secondary Schools

*This information on secondary schools is also taken from [www.sep.gob.mx](http://www.sep.gob.mx) and includes mainly background information.*

## **Background Information:**

- There are approximately 5,300,000 secondary school students in 30,000 schools staffed with over 300,000 teachers. 90% of the schools are public.
- Over 10,500 pesos are spent on the average student yearly.
- There are two main types of secondary schools: specialized technology schools or general education schools. Students can get one or both types of diplomas – 42% of students leave secondary school with a technology diploma.

## **The Future**

This information includes more facts and what must be done to help bring fair distribution of the Internet to Mexican schools.

### **Establishing a widespread Internet in schools:**

- Less than 2% of public schools have Internet and computer access.

### **Distributing the wealth of the Internet:**

- Since more funding is spent on students later in their educational process, those who advance are more likely to encounter technology and the Internet. This leads to a more technology ready “elite” population who knows how to use technology, while the poor lack these resources.

Educación primaria <sup>1/</sup> (Ciclos escolares)		1990-1991	1991-1992	1992-1993	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001 <sup>e/</sup>
Concepto		14,401.6	14,397.0	14,425.6	14,469.5	14,574.2	14,623.4	14,650.5	14,647.8	14,697.9	14,765.6	14,808.3
MATRICULA (miles)												
Por tipo de control												
Federal		10,274.0	10,242.7	973.5	979.9	1,007.8	1,024.1	1,019.5	1,008.1	997.7	971.8	958.1
Estatal		3,241.8	3,240.2	12,529.4	12,567.2	12,642.8	12,695.1	12,704.3	12,663.0	12,665.7	12,703.1	12,709.5
Particular		885.8	914.1	922.7	922.4	923.6	904.2	926.7	976.7	1,034.5	1,090.7	1,140.7
Por tipo de servicio												
General		13,730.8	13,685.3	13,700.7	13,715.3	13,777.1	13,771.4	13,776.4	13,757.2	13,783.1	13,841.2	13,868.3
Indígena		588.5	617.5	640.1	660.0	669.0	710.7	728.1	741.8	763.5	778.6	787.9
Comunitaria rural		82.3	94.2	84.8	94.2	128.1	141.3	146.0	148.8	151.3	145.8	152.1
MAESTROS (número)		471,625	479,616	486,686	496,472	507,669	516,051	524,927	531,389	539,853	543,694	545,717
Por tipo de control												
Federal		343,088	348,090	39,077	39,680	43,945	45,730	47,254	48,152	49,646	47,803	47,681
Estatal		101,661	102,847	417,368	424,881	430,506	436,421	441,463	446,449	451,428	454,858	455,121
Particular		26,876	28,679	30,241	31,911	33,218	33,900	36,210	36,788	38,779	41,033	42,915
Por tipo de servicio												
General		442,845	448,422	455,137	463,333	470,251	475,184	481,324	486,160	491,840	496,717	497,702
Indígena		22,001	23,399	24,555	25,535	25,899	27,855	29,163	29,721	30,738	31,432	31,808
Comunitaria rural		6,779	7,795	6,994	7,604	11,519	13,012	14,440	15,508	17,275	15,545	16,207
ESCUELAS		82,280	84,606	85,249	87,271	91,857	94,844	95,855	97,627	99,068	98,286	99,176
Por tipo de control												
Federal		65,496	67,315	9,397	10,008	13,941	15,478	15,916	16,853	17,796	16,612	17,147
Estatal		13,230	13,457	71,742	72,779	73,128	74,261	74,668	75,275	75,580	75,760	75,844
Particular		3,554	3,834	4,110	4,484	4,788	5,105	5,271	5,499	5,692	5,914	6,185
Por tipo de servicio												
General		68,714	69,782	70,894	72,065	72,757	73,409	73,868	74,467	74,796	75,097	75,288
Indígena		6,787	7,029	7,361	7,602	7,581	8,423	8,543	8,764	8,913	8,962	9,068
Comunitaria rural		6,779	7,795	6,994	7,604	11,519	13,012	13,444	14,396	15,359	14,227	14,820
Producción de libros de texto gratuitos <sup>2/</sup> (miles)		74,744.0	74,880.4	71,414.3	82,006.3	131,245.3	121,050.0	123,744.6	124,862.3	119,700.0	131,041.1	128,357.5
Alumnos		74,054.0	74,180.7	70,747.7	81,383.2	126,114.3	113,575.0	112,990.0	121,628.9	116,200.0	122,842.6	123,198.5
Maestros		690.0	699.7	666.6	623.1	5,131.0	7,475.0	10,754.6	3,233.4	3,500.0	8,198.5	5,159.0
Gasto federal por alumno <sup>3/</sup> (pesos corrientes)		493.4	752.3	1,099.0	1,482.1	1,731.3	2,327.3	3,200.9	3,887.8	5,012.4	6,164.5	6,904.2
Indicadores de eficiencia (porcentajes)												
Deserción		5.3	4.6	4.1	3.6	3.4	3.0	3.1	2.9	2.4	2.3	2.1
Reprobación <sup>4/</sup>		10.1	9.8	8.3	8.3	8.1	7.8	7.6	7.3	6.8	6.4	6.0
Eficiencia terminal <sup>4/</sup>		70.1	71.6	72.9	74.2	77.7	80.0	82.8	84.9	85.8	84.5	86.3

1/ Con la firma del Acuerdo Nacional para la Modernización de la Educación Básica a partir del ciclo escolar 1992-1993, se reestructuró la atención a la demanda entre el control federal y el estatal.

2/ La cifra de producción puede no corresponder a la distribución.

3/ Incluye el gasto federal por alumno atendido en el control federal y federalizado, es decir, los transferidos al control estatal desde el 18 de mayo de 1992. A partir del ciclo escolar 1998-1999, se refiere a cifras estimadas.

4/ Los datos de reprobación y eficiencia terminal son estimados para el ciclo 1999-2000.

e/ Cifras estimadas.

Fuente: Secretaría de Educación Pública

Educación secundaria <sup>1/</sup> (Ciclos escolares)											
Concepto	1990-1991	1991-1992	1992-1993	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001 <sup>e/</sup>
MATRICULA (miles)	4,190.2	4,160.7	4,203.1	4,341.9	4,493.2	4,687.3	4,809.3	4,929.3	5,070.6	5,208.9	5,348.1
	Por tipo de control										
Federal	2,912.1	2,869.9	443.6	443.7	442.8	444.7	442.1	431.0	423.0	415.3	412.7
Estatad y autónomo	940.2	952.7	3,416.4	3,556.2	3,713.1	3,912.5	4,032.7	4,143.1	4,271.9	4,395.5	4,515.5
Particular	337.9	338.1	343.1	342.0	337.3	330.1	334.5	355.2	375.7	398.1	419.9
	Por tipo de servicio										
General	2,493.1	2,447.5	2,436.4	2,488.6	2,533.8	2,595.1	2,609.8	2,640.4	2,659.2	2,692.1	2,733.0
Para trabajadores	105.1	94.9	88.1	85.0	78.8	74.8	69.0	63.5	59.7	53.7	48.9
Telesecundaria	470.1	484.8	512.7	558.6	618.6	690.7	756.7	817.2	913.6	992.6	1,076.3
Técnica <sup>2/</sup>	1,121.9	1,133.5	1,165.9	1,209.7	1,262.0	1,326.7	1,373.8	1,408.2	1,438.1	1,470.5	1,489.9
MAESTROS (número)	234 293	235 832	237 729	244 981	256 831	264 578	275 331	282 595	293 008	299 999	307 763
	Por tipo de control										
Federal	146 950	147 022	25 686	25 986	27 146	27 866	28 741	28 236	28 201	27 532	27 292
Estatad y autónomo	58 283	59 098	180 781	186 188	194 937	200 971	210 096	216 285	224 480	230 843	236 552
Particular	29 060	29 712	31 262	32 807	34 748	35 741	36 494	38 074	40 327	41 624	43 919
	Por tipo de servicio										
General	145 196	144 872	145 553	149 455	156 021	159 599	164 395	166 940	171 765	174 455	177 833
Para trabajadores	8 003	7 658	7 230	7 013	6 988	6 618	6 549	6 319	6 136	5 751	5 242
Telesecundaria	22 882	24 265	25 198	26 636	29 314	31 785	34 882	38 698	42 057	45 409	49 285
Técnica <sup>2/</sup>	58 212	59 037	59 748	61 877	64 508	66 576	69 505	70 638	73 050	74 384	75 403
ESCUELAS	19 228	19 672	20 032	20 795	22 255	23 437	24 402	25 670	26 710	27 512	29 007
	Por tipo de control										
Federal	8 982	9 152	867	877	884	907	918	918	929	917	909
Estatad y autónomo	7 960	8 168	16 720	17 388	18 750	19 824	20 714	21 883	22 817	23 536	24 870
Particular	2 286	2 352	2 445	2 530	2 621	2 706	2 770	2 869	2 964	3 059	3 228
	Por tipo de servicio										
General	7 129	7 219	7 353	7 606	7 864	8 049	8 193	8 410	8 599	8 794	9 020
Para trabajadores	527	522	502	488	482	455	446	432	425	395	356
Telesecundaria	8 423	8 725	8 908	9 339	10 439	11 373	12 081	13 054	13 851	14 420	15 667
Técnica <sup>2/</sup>	3 149	3 206	3 269	3 362	3 470	3 560	3 682	3 774	3 835	3 903	3 964
Gasto federal por alumno <sup>3/</sup> (pesos corrientes)	1,028.9	1,445.0	1,981.7	2,402.2	3,139.4	3,480.5	4,655.1	6,301.2	7,978.5	9,446.5	10,580.1
	Indicadores de eficiencia (porcentajes)										
Absorción	82.3	82.9	83.8	85.8	87.7	87.0	86.7	87.8	90.0	91.0	92.0
Deserción	9.5	8.8	8.4	7.4	8.2	7.7	8.8	8.9	9.7	8.5	8.5
Reprobación <sup>4/</sup>	26.5	26.3	26.4	24.7	23.5	23.7	22.8	22.3	21.1	20.7	20.0
Eficiencia terminal <sup>4/</sup>	73.9	75.3	76.4	77.5	76.2	75.8	74.8	73.8	76.1	75.7	76.3

1/ Con la firma del Acuerdo Nacional para la Modernización de la Educación Básica a partir del ciclo escolar

1992-1993, se reestructuró la atención a la demanda entre el control federal y el estatal.  
2/ Incluye los servicios de secundaria técnica industrial, agropecuaria, pesquera, forestal e indígena.

3/ Incluye el gasto federal por alumno atendido en el control federal y federalizado, es decir, los transferidos al control estatal desde el 18 de mayo de 1992. A partir del ciclo escolar 1998-1999, se refiere a cifras estimadas.

4/ Los datos de reprobación y eficiencia terminal para el ciclo escolar 1999-2000 son estimados.

e/ Cifras estimadas.  
Fuente: Secretaría de Educación Pública.





# México

## *The Information Revolution in Latin America Obstacles and Opportunities through the Internet*

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### Computer Science Education in Mexico

- Although, computer education is more readily available in institutions of higher learning, the actual number of Mexicans who attend university is small.

1. 14,808,300 students are enrolled in elementary education; however, as level of education increases -drop-out rates also increase. Only 33.8% of this number is enrolled in highschool and an even smaller percentage -11.4% - is enrolled in colleges or universities.

2. In the 2000 census, 35.78% of students said that lack of money or necessity to work had forced them to drop out of school This is compared to 26% who said that they did not like school or no longer wanted to study. This means that there is a huge segment of the population that is economically being restrained from continuing their studies.

- There are 488,600 thousand students enrolled in technology related programs, but only a fraction in computer science programs.
- It seems that traditional notions of prestige still drives many students to pursue degrees in law or business administration rather than specializing in computer networking or software development.

1. The National Association of Universities and Institutions of Superior Education, which is comprised of 134 private and public member schools, has 107,149 students in postgraduate programs.

2. -Of this number, 43,285 students graduated with diplomas in social and administrative sciences (economics, political science, law, international relations).

-23,245 graduated in education and the humanities (art, education, history etc.)

-Only 4164 graduated in either computer science or electrical engineering.

- It is only the most elite universities that are able to provide an adequate technical education and provide up to date computer services to students.

1. The Internet can be a misleading source of information because most of the websites contain information from a select group of Mexico's universities.

2. Such universities as the:

- a. Universidad Nacional Autonoma de Mexico
- b. Instituto Politecnico Nacional



- c. Universidad de las Americas Puebla
- d. Instituto Tecnológico Autónoma de México
- e. Instituto Tecnológico de Estudios Superiores de Monterrey

Have computer science requirements similar to U.S. schools including Stanford.

- Content of technical education varies and oftentimes university programs do not fulfill demand.

1. According to recent reports, Mexican universities are producing code writers, programmers and technical support people, but simply not enough information technology experts including network specialists, programmers, and software developers.
2. Experts have a difficult time trying to stay on the cutting edge; it is difficult to keep up with new versions of programs and programming language.
3. Although, these experts are in short supply everywhere, Latin American countries, with the inclusion of Mexico, will see a more acute deficit in the next four year than other regions. This means there will be a deficit in network experts of 63 percent in 2004 compared with 29 percent or 1.9 million jobs worldwide.

- To fulfill the demand for certain types of technical workers, companies such as Cisco Systems and Microsoft have set up certification programs inside existing universities and institutions.

1. According to the coordinator of the Cisco networking academy, a graduate of the program will receive eight job offers.

- The Secretary of Public Education recognizes science and technology as a priority for development.

1. Efforts are now being made to increase the number of post-graduate students 31,871 students received scholarships to study in institutions inside and outside the country.-CONTACYT
2. The SEP claims that it will increase the 4.2% of its' budget on improving science and technology within schools.
3. SEP has 198 schools all over the country to provide basic computer skills classes.

- In conclusion, we must not forget that Mexico has a very young population. More than 56 percent of the population is 24 years and younger. It is important that Mexico decide to pursue a bottom-up approach in technical training or it will never have a strong enough base of human capital to support modern technologies.



# México

*The Information Revolution in Latin America  
Obstacles and Opportunities through the Internet*

The Context of the Problem

## **Mexican Internet Statistics**

Socio-economic Indicators and information related to Telecommunications and IT may be found at [http://www.tebela.org/mexico/mexio\\_report.htm](http://www.tebela.org/mexico/mexio_report.htm). Some of this information is a few years old, but is still the latest information available.

Information Technology:

In 1993 there were nearly 1,200 companies with IT managers; of the total, 72% were located in the Federal District and 18% in the State of Mexico. In that same year, there were around 160,000 BA-level students; the most popular major being computer science and systems (6.56%); followed by industrial engineering (4.84%), and electric and electronic engineering (4.10%). Also, there were 11 post-graduate excellence programs in computer science and systems; 64 for engineering and technology, and 226 for other types of academic programs related to science and technology. It is necessary to add that there were around 30 Mexican groups related to information technology and computer science.

The History of the Internet in Education:

There has been a dizzying growth of the worldwide web in Mexico. The story began in 1989 when the Monterrey Institute of Technology [*ITESM – Instituto Tecnológico de Estudios Superiores de Monterrey*] became the first Mexican institution to be linked to the Internet, via a connection with the University of Texas in San Antonio. The connection was specifically with the school of medicine. (It is necessary to clarify that, from 1986, the ITESM was a participant in Bitnet.)

The second Internet connection in Mexico was the National Autonomous University of Mexico [*UNAM – Universidad Nacional Autónoma de México*] (an institution that was also connected to Bitnet), in particular the Institute of Astronomy, by means of a connection via satellite of 56 kbps, with the National Center of Atmospheric Investigation (NCAR) of Boulder, Colorado, in the United States. Later on the ITESM and the UNAM were interconnected using analogical private lines of 9,600 bps.

In the beginning of the nineties, there were other academic institutions connected to the Internet via the ITESM; moreover, the University of Guadalajara [*UdeG – Universidad de Guadalajara*] had been connected to the University of California in Los Angeles, by means of a private line. Other institutions began to connect to the Internet via switchboards.

Such was the growth of the networks that in 1992 Mexnet was created, made up of academic institutions; also, Bajared was created, drawing together academic organisations in the north of the country. In 1994, after the Autonomous Technological Institute of Mexico [*ITAM – Instituto Tecnológico Autónomo de*

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*México*], Conacyt and the Autonomous Metropolitan University [*UAM – Universidad Autónoma Metropolitana*] were linked to the Internet, the National Technological Network [*RTN – Red Tecnológica Nacional*] was formed, made up of Mexnet and Conacyt, with a connection of 2 Mbps (E1). In that same year, the net opened up at a commercial level.

During 1995 networks like RTN consolidated, creating a national backbone and including numerous investigative, commercial, and educational institutions of the whole Republic. Also, commercial Internet suppliers (ISP) arose that didn't only offer connection to the Internet, but also other types of value added services.

The following year the Network Information Center of Mexico [*Nic-Mexico – Centro de Información de Redes de México*], began to operate which took charge of the coordination and administration of Internet resources assigned to Mexico. In 1996 the Mexico chapter of the Internet Society also opened, which was in charge of the global coordination of the Internet; as well as the Computer Emergency Response Team of Mexico.

In 1997 there were more than 150 suppliers offering their services throughout Mexico. Currently the states that have more than 30 ISPs are: Coahuila (30), Baja California (31), Baja California Sur (31), Puebla (32), Querétaro (33), Veracruz (34), Guanajuato (34), Estado de México (45), Nuevo León (45), Jalisco (45) and the Distrito Federal (93). The majority are concentrated in the north and the center of the Republic.

However, recently Telmex was authorized to exponentially increase their rates for the installation of the dedicated lines used by ISPs, which has frozen new ISPs' investment plans.

A few weeks ago, PSINet bought Datanet and Internet de México, which are the biggest suppliers in the country (20,000 and 15,000 users respectively) after Telmex with 150,000 users.

The number of Internet users has also shown significant growth in the past few years; it is considered that in 1998 in the government there were 31,000 users; in the home market 274,000 (with an annual growth of 82%); in the educational sector 302,000 and in the private sector 742,000.

Lastly, according to Nic-Mexico data, for April of this year there were 115,849 hosts under the .mx domain; and the UNAM, so far, has registered nearly 350 Mexican web sites related to medicine, the government, the financial sector, the academic sector, the IT/computer science field and companies that offer Internet services, among others.

## Internet 2:

Seven universities (UNAM, Universidad Autónoma Metropolitana, Universidad de Guadalajara, Universidad de las Américas [*University of the Americas*], Universidad Autónoma de Nuevo León [*Autonomous University of Nuevo León*], Instituto Politécnico Nacional [*National Polytechnical Institute*] and ITESM), as well as the Conacyt and Telmex, are involved in the Internet 2 project that will begin to work before the end of 1999. It will be a purely academic network with a wide band width that will allow the transmission of data at speeds measured in gigabytes per second. In this way, investigators, professors and students of the Mexican institutions of higher education will be able to handle more complex information at higher speeds and without reception problems; they will be able to consult world-wide information banks, digital libraries and national and international super-computers. There will also

be a meteorological area and another dedicated to tele-medicine. Also, together with some private companies, the institutions involved formed the University Corporation for the Development of Internet 2 [*CUDI – Corporación Universitaria para el Desarrollo de Internet 2*], the organism in charge of promoting this new network.

## **General Mexican Internet Information**

Robert Collier of the San Francisco Chronicle talks about general Internet issues in Mexico during August of 1999. His article, *Mexicans Divided By Digital Revolution*, can be found at <http://www.euromktg.com/eng/ed/gre/081099.html>. The following excerpts include information on the Internet in the educational sector.

The Library of Congress, Mexico's main public research facility, is a cavernous and dignified place swarming with scholars young and old. But there's something missing in its hallowed halls.

Ask for an Internet connection, and all you'll get is a blank look.

"Computers?" a clerk responded to a visitor's question. "Internet? No, we don't have that sort of thing. You'll have to try a computer store."

The answer is the same at all the other public libraries in Mexico City, none of which has Internet access. And so it goes nearly everywhere else throughout the country.

Mexico, whose economy is modernizing by leaps and bounds in many ways, is leaving huge portions of its citizenry behind in the Internet revolution.

The number of Internet users in Mexico has nearly doubled annually in recent years and now is estimated at 1.3 million people, or 1.4 percent of the population. Many corporations, especially those involved in international trade, now use the Internet extensively, as do most private schools and universities.

Yet broad sectors of Mexican society -- those without money or access to wealthy institutions -- have no access to the Internet or computers.

Unlike developing nations such as Singapore, India and Malaysia, where heavy government investment in computer education has spawned successful computer-related industries, Mexico has lagged behind.

For people such as Sebastian Lopez and Rocio Sanchez, the doors are closed. The two architecture students at the National Autonomous University of Mexico "would like to be able to use it, but it's expensive," said Sanchez recently as she and her companion walked out of the Library of Congress after a long afternoon of poring through musty books.

"At the university, they only give Internet access to students who are engaged in research," she said. "The rest of us are out of luck."

Sanchez explained that the only places where she can log on are cyber-cafes and computer stores, which charge about \$3 per hour for Internet access -- too expensive for an average student except on the occasional splurge.

Knowledgeable Mexicans warn that a technology gap is being created throughout the nation, dividing society between technology haves and have-nots.

"The government talks a lot about globalization, but it has no real policy for developing technology or creating the information infrastructure that Mexico needs," said Adolfo Aguilar Zinser, an independent member of the federal Senate who is probably the nation's most tech-savvy lawmaker.

"The government is simply letting the market take the lead. As a result, the public education system is badly behind. Technology and the Internet are being spread very unevenly, increasing social disparities."

Even in the United States, where the existence of a large middle class and government spending for Internet access in libraries and schools have enabled about 30 percent of the population to be

regular users, recent studies show that the poor, especially African Americans and Latinos, are being left on the losing side of a "digital divide."

### SOME BRIGHT SPOTS

But the picture is not entirely bleak. In fact, Mexico has taken some innovative strides in broadening public access to technology:

-- Education. Federal and state school authorities have developed an ambitious program to set up computer labs in public schools. Red Escolar, or School Network, incorporates elementary and secondary schools in a simulated Internet system using Edusat, Mexico's educational television channel via satellite. Although officials say more than 2,600 of the nation's 130,000 schools now have working Internet connections, the real number online is probably much lower -- for example, when officials proudly directed a Chronicle reporter to one such model school, the National Teachers College High School in Mexico City, teachers there admitted that they still hadn't received the funding or hardware to get online.

-- State initiatives. The central state of Guanajuato has gone commercial by linking up with Microsoft to try to start a locally based, for-profit English-language software industry. Under the program, Microsoft has given computers, software and initial training to 20 teachers, who now are teaching 300 students in a half-dozen state colleges and technical institutes. Guanajuato's program was started earlier this year by Gov. Vicente Fox, the presidential candidate of the conservative National Action Party for next year's election. His aides say they want to join with more U.S. firms and create a Mexican version of Silicon Valley.

-- Nonprofit organizations. Since the Zapatista rebels started their uprising in January 1994, they and their backers have used the Internet to rally support worldwide. The online public-relations offensive has been echoed by activist groups and nongovernmental organizations -- ranging from Indian supporters of the Zapatistas to environmentalists and feminists -- putting the government's well-oiled but tech-poor publicity machine on the defensive.

The average age of Internet users in Mexico is 25. This number is growing smaller, according to data in the *Mexican Economic Report* from March, 2000 at <http://www.mexconnect.com/MEX/lloyds/llydeco0300.html>.

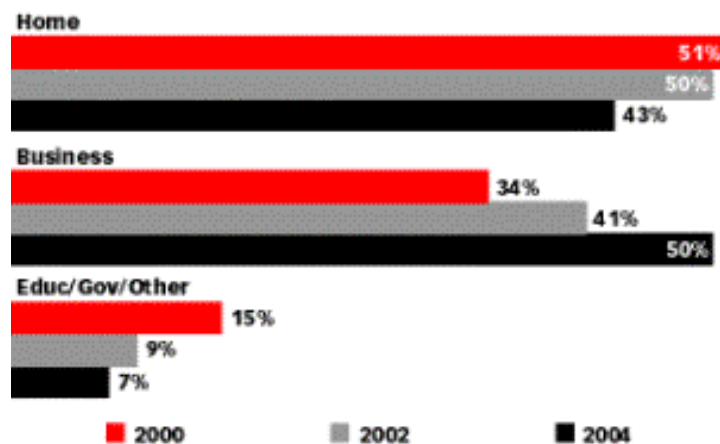
# Educational Internet Profiling

Noah Elkin talks about the type of Internet users in Mexico and Latin America in his article at

[http://www.emarketer.com/analysis/elatin\\_america/20001114\\_latam2.html](http://www.emarketer.com/analysis/elatin_america/20001114_latam2.html).

Interestingly enough, he sees the amount of Internet usage in education dropping in the next four years. He also notes that the majority of Internet usage in schools is for email, followed by chat rooms.

## Percent of Internet Users by Location of Use in Latin America, 2000-2004



Source: MSDW, 2000

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## Internet Activities of Survey Respondents in the Previous 30 Days

	Home Users	Work Users	School Users	Other Place Users
E-Mail	69%	63%	46%	37%
Read News	33%	33%	21%	16%
Visit a Chat Room	31%	16%	28%	31%
Did Shopping for Business	4%	7%	1%	1%

Source: TGI Latina, cited on Zonalatina.com, 8/24/2000

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## The Digital Divide

Javier Garza Ramos explains more about the digital divide between Mexico and the United States in his article called *The Digital Border* from October of 2000; it can be found at

[http://www.micontacto.com/micontactoes/news/print.cfm?id\\_secao=76&id\\_conteudo=4148](http://www.micontacto.com/micontactoes/news/print.cfm?id_secao=76&id_conteudo=4148).

Ramos examines the differences between Acuña, Mexico and Del Rio, Texas.

In the schools, the situation isn't any better. Only the private schools have Internet access. No secondary or preparatory public school does. In higher education, the

University of Coahuila and the Technological Institute of Acuña, do have Internet connections, but as Ruben Hernandez says, “it would be ridiculous if they didn’t.”

# Steps to a Solution

## THEORIES & SOLUTIONS

### Steps to a Solution

In her work entitled *Access to the Electronic Age: Four Rural and Developing Regions*, Heather Hudson talks about three levels of Internet implementation in developing countries. Her work project may be found at <http://www.crlsdc.edu/coll/BooksPages/Access%20to%20the%20ElectronicAge.htm>. The first step is community integration and includes the availability of the Internet at libraries, informants or other public places. The second step is institutional integration and includes schools. The first step is home integration. Specific to Mexico, all three steps have been completed in a small percentage of the population, but on the level of Mexico as a whole, the country is still in the first step of making the Internet available to the public.

### Carlos Slim's Plans

Carlos Slim, the richest man in Latin America, owns Telcel, Com&SA and many other companies. Here is a portion of an interview with Slim from <http://www.businessweek.com/2001/01/01sb69951/>.

Q: In Mexico, Telecom has more than 10 million telephone subscribers and more than 5 million cellular-phone customers, but is reaching ongoing subscribers. And you are the largest Internet service provider in Mexico. But even half of Mexicans are poor and cannot afford to own a telephone line, much less buy a computer. What about that? A: Telephony and the Internet are going to reach even very poor rural areas. Not everyone has a phone, but we'll reach them with public Internet phones. We will 250 million telephone calls each year, so even if people don't have their own phone, they'll have access that way. We're putting shared telephones in apartment buildings. We're negotiating with the Education Secretariat to make sure that every school in Mexico has a computer and Internet access. In order for our countries to emerge from backwardness, it's very important that everyone participate in this digital technology culture and the Internet. Spreading that culture is fundamental for our long-term development.

### Red Escolar

This is a program started by the government to incorporate Internet curricula into schools in Mexico. The website is <http://www.redescolar.dic.edu.mx/>. A general program introduction from the website is:

El principal propósito de Red Escolar es llevar tecnología de informática y comunicación a las escuelas públicas del país, con el fin de elevar la calidad de la educación. Es importante utilizar los medios de comunicación para llevar información pertinente a todos los niveles de la República mexicana y lograr una mejor equidad en la educación.

Red Escolar busca que los maestros y los alumnos aprendan a encontrar información, a visualizarla con el proceso educativo y a sintetizar sus opiniones sobre un tema en particular. Adicionalmente, busca que todos los maestros, niños y jóvenes se conecten paulatinamente en internet, a través de la publicación de páginas Web.

El curso estará dirigido a profesores en servicio de enseñanza primaria y secundaria que inicien su trabajo con tecnología de información y comunicación. Por lo tanto deberá ser de carácter general. En cursos posteriores se podrá particularizar por nivel educativo o especialidad curricular. Deberá ser indicador del uso de la tecnología dentro del aula sin perder en ningún momento la orientación educativa. Se debe responder siempre a la pregunta ¿en qué me beneficia el uso de tecnología? Desde el acceso a Internet y a correo electrónico hasta el manejo de programas de cómputo, de maestros debe tener claro cómo podrá aplicar lo que aprende en su trabajo diario con los alumnos.

Este curso debe generar en los profesores la necesidad de aprender a ser un usuario activo de Internet, correo electrónico, y procesador de palabras, una hoja de cálculo, un elaborador de presentaciones y un lenguaje simple de programación que le permita crear páginas en la Web. Cursos específicos para el manejo de dichas herramientas ya están desarrollados por el ICEE, utilizando la televisión educativa y el Internet.

The program objectives include:

- Informar a los profesores en servicio sobre el programa de Red Escolar.
- Usar los diferentes medios por los que se puede tener acceso a información, con sus alcances y limitaciones.
- Buscar un espacio de reflexión constante sobre la importancia del uso de la tecnología en el proceso educativo.
- Valorar la importancia de la comunicación para construir comunidades de aprendizaje (profesores-colaboradores).
- Generar el interés por aprender a manejar equipos de cómputo, tanto en hardware como en software básicos.
- Mostrar la oferta de capacitación ofrecida por Red Escolar y el ICEE, tanto para cursos presenciales, como para diplomados, maestrías y doctorados ofrecidos para maestros de educación básica en el uso de tecnología educativa.

### Free Software in Mexico

The Mexico Weekly Report from August 18, 1999 includes information about how Linux could revolutionize computers and the Internet in Mexico. The article can be found at <http://www.mexicoweb.com/Articles/MFR.01.1999>

Linux in Mexico: Taking the Schools By Storm

In the computer world, the hottest topic for over a year now has been a powerful operating system that is becoming a major competitor to the ubiquitous Windows operating system. This new system is called Linux, and is named after it's creator, Linus Torvalds. Torvalds is from Finland and was in college at the time he created a simple operating system in 1991, which he distributed to friends over the internet. Since then, many thousands of programmers around the world have contributed to it.

The advantages of Linux are well known in Mexico. It is stable, powerful, flexible, and it runs on many different kinds of computers. Perhaps its most important feature is its price - it is free. It is the flagship of the Open Source movement, meaning that the computer code used to create it is freely available to anyone who wants it.

Because of its amazing features, Linux has launched a major project in Mexico known as Scholar Net. The leader of this project is Arturo Espinosa Aldama at the UNAM. On the Scholar Net web page he writes:

I work as the project leader of the "Scholar Net", a program that aims to bring computers and the net to every elementary and mid-level school in Mexico. We expect to install from 20 to 35 thousand laptops per year to a total of 40,000 computers in the next five years.

Due to matters of cost, reliability and configurability, we plan to use GNU/Linux to replace the proprietary server options used, now thanks to GNOME, the proprietary desktop application options.

We will develop GNOME in a point where we can get a useful and friendly enough desktop for the elementary and high school students. There are some aspects of GNOME, such as uniformity, Spanish translation, font fixing and application development which we will address to achieve this.

At an average of 20 users per machine, and being off of their school children and teachers, GNU/Linux will become, at the long term, a major influence in Mexico. In the short term, GNOME will get an additional impulse from us and those who will contribute following our guidelines, and GNU/Linux will prove to be a real world option for the end user.

This is a major project in benefiting one of the most important resources in the country, the youth. The project is open to anyone who would like to contribute to it in any one of numerous ways.

### Other Ways to Get Computers and the Internet to Mexican Schools

Gary Chapman, the director of the 21<sup>st</sup> Century Project at the University of Texas at Austin presents an interesting idea of how the Internet could be brought to Mexican schools. This idea is economical and very efficient. It has been taken from <http://www.k12link.org/link/technology/education/1997.html>

Mexico also needs a better telecommunication infrastructure. Telcel, the recently privatized national phone company, and its competitors, such as Anatel, are slowly building up their capabilities. But they will not cover much the vast numbers of Mexicans who live in underserved and poor areas. So you should pay attention to a San Diego company called Tachyon, Inc. (<http://www.tachyon.net>), which is doing business in Mexico. Tachyon has a contract for using SatNet S, the powerful Mexican satellite that covers all of Mexico. Tachyon is offering inexpensive two-way Internet service via satellite, and it can serve every town and village in Mexico right now. The company's vice president, Santiago Orozco, who is 33 and from Mexico City, told me that its price for broadband Internet connectivity for a typical Mexican school with five to 10 computers is only about \$300 per month. This is thousands of dollars less than what Telcel can offer, and it can happen tomorrow, not in some indefinite future. Incidentally, the general equipment Tachyon provides is a common one and Linux. With the combination of free software and inexpensive Internet connectivity, as well as funding on Mexico's Red Escolar (Scholar Net) program for using Mexican schools, the country could become the world's leading example of affordable high-tech infrastructure for the rest of the world's developing nations. Moreover, the philosophy behind free, open-source software fits well with your important ideas about a new "open society" in Mexico. This will be using processes, but not internally eventually. For Mexico to adopt a conventional model of development, dependent on big corporate players and mega-deals, but you have the opportunity to learn something different and to also something. These years, prestige and status to your young people, to your entrepreneurs and innovation and to the practical solution of the free software movement. This will pay off in the long run, and it could dramatically transform Mexico.

David Rothman talks about how an Electronic Peace Corps could distribute computers throughout Mexico and could be funded by wealthy companies or individuals in his article "How Technology Could Help Chiapas - and Mexico City" at <http://www.infodiv.org/techbook.htm>

But how can ITESM expand on past accomplishments and truly popularize the technology? Or as I come here today with my [Electronic Peace Corps](http://www.peacecorps.org) and TeleRural projects, both of which could benefit from cooperation among leaders of education, government, business, labor, and nonprofits.

The phrase [Peace Corps](http://www.peacecorps.org) may be known to all. Bizarre things happen when words travel through the tongues of even intelligent people who are not born into a language. No Peace Corps does not mean "Peace Corps" or "Peace Body." Instead it's "Corps" as in "Marine Corps," except that here we are talking peace instead of war. President John F. Kennedy started the Peace Corps in the 1960s to encourage young citizens to go abroad, learn new cultures, and befriended people in developing countries, while helping them dig more sanitary wells, grow more food and better educate their children. The Peace Corps still exists and has't just helped developing countries; it has also helped its members develop as teachers, as managers, as humans...

I had similar goals for a U.S. Electronic Peace Corps when I proposed the idea about a decade and a half ago. Back then, while researching my book [Digitals.com](http://www.digitals.com), I helped Arthur C. Clarke and director-writer Peter Hyams put together a team Pacific computer link for the writing of the script to the movie 2010. The connection between Los Angeles and Sri Lanka enabled the two to accomplish far, far more than if they had been at the mercy of expensive Tels - even in those ancient days of 300-band modems. Much more easily than on the phone they could dwell on the details. And what was the technology but the same, *digitals*! I published the Electronic Peace Corps idea in *Computerworld*, *InfoWorld*, the *San Jose Mercury News*, the *Miami Herald*, the *Los Angeles Herald Examiner*, the *Washington Post* and a number of other newspapers, and I used to have a [home page](http://www.digitals.com), which had been a cornerstone for the U.S. Peace Corps and which had been an important resource to paper-knowledgeable experts on-line at the time from the field - in this case, remote Pacific islands - in the States. The dream was considerable and it was a very small way but already became a reality.

A former Peace Corps training director named Roger Nicholson liked my Electronic Peace Corps proposal, and [William F. Buckley, Jr.](http://www.digitals.com), a prominent conservative columnist, wrote several excellent columns about the idea and even helped me get it into his *National Review*. What's more, I had the satisfaction of reading or hearing of other people's "Electronic Peace Corps" after I proposed them. Similar brainstorms have come to the former George Gilmer, a stray computer executive or two, a luminary in the Internet Society, Nicholas Negroponte himself (under the name "School Corps"), even a ex-CIA man - though I figure he has been the first, and almost surely the first to reach print. No plajonism charged. The words "Electronic Peace Corps" must be generically inspired on half the globe of the planet, and I'm too interested in claiming credit than to sueing a soul, but Corps comes into existence.

Meanwhile I've been refining my own vision. Early on Jerry Gernert mentioned that Washington should not only start its own Electronic Peace Corps, but encourage Third World countries to band together and start a corps of their own. And today I'd go a step beyond and suggest that Mexico lead the way for the rest of the planet and establish a domestic Electronic Peace Corps that, if successful, could also help to help other countries and someday work with an International or United Nations Electronic Peace Corps. But Washington catch up with Mexico City. The nearest Mexico starts its own Electronic Peace Corps, the more easily I can persuade the United States to establish one.

This is what ITESM to discuss the idea is entirely fitting. Quite a few members of the Mexican Electronic Peace Corps will be graduates of ITESM and other Mexican universities, or maybe students taking breaks from their regular studies. Older people could participate, too. In fact, many of the Corps members could be telephone workers taking time off from their regular jobs to gain new technical and business skills.

What's more, some of the carefully chosen members might come from United States and other countries. A number of them, in fact, might remain in their home towns and electronically join Mexicans on the scene in offering help to remote villages. Take [Patrick and Jennifer Duffy-Sing](http://www.digitals.com), a couple who served in Uruguay with the U.S. Peace Corps. With great satisfaction they tell me how they broke up Uruguayan schools to the Internet, and now they would love to be able to use the Net to share with rural Mexico their expertise in education. Returned Peace Corps people, working full or part time, would be materials for the Mexican Electronic Peace Corps. You might coordinate some activities with the U.S. Peace Corps and maybe an Electronic Peace Corps agency working within or alongside the regular Peace Corps. Also, I can use a Mexican Electronic Peace Corps and a U.S. counterpart as a way to help carry out the [unconquered](http://www.digitals.com) - safety and later laws that accompanied the North American Free Trade Agreement. Not surprisingly, an official in a branch of the U.S. government dealing with first-aid help took a strong interest in the Electronic Peace Corps concept when I discussed it on a meeting he hosted by the White House. He and Mexican counterparts could meet regularly before each other's activities and swap technical advice.

Clearly, in many respects, the Mexican Electronic Peace Corps could be an international effort. But Mexican citizens would comprise most of this Electronic Peace Corps and set its goals. And along the way, help might go both directions. Villagers familiar with folk remedies just might heal U.S. pharmaceutical researchers to new drugs, and social workers in Mexico just might have the solution to problems in Los Angeles or New York.

Whenever the members of the Mexican Peace Corps came from, they would be like their counterparts in the U.S. Peace Corps - among the brightest, hardest-working and most dedicated of their generation. The Mexican Peace Corps would build up gradually rather than risk heavy standards.

Business Week explores the role high-tech companies are playing in the Mexican education sector; this article may be found at <http://www.bizweek.com/education/01/01/01sb69951.htm>

The benefits of software in the Latin American Region for Communicative Education (RCE), a non-profit organization founded in 1956 to improve the region's ability to acquire communication technology. Funded in part by United for the State-American Development Bank, RCE acts as the link between schools, state governments and the high-tech giants. It has received support from Compaq, Dell, Microsoft, Wang, Acer and others. RCE subsidizes the purchase of equipment and software for schools. For example, say a Mexico City high school or a rural school district wants to purchase 50 computers. The school puts up half the money, and RCE matches it. RCE is team works out reciprocal deals with computer manufacturers. The same process comes into effect for leading the machines with software. This way cash-strapped schools are able to equipment at half of an already exorbitant price.

RCE has also set up training labs, using equipment donated or subsidized by high-tech firms, to train teachers in the ways of technology. Microsoft, for example, has donated its Visual Studio Enterprise Edition software for use in the labs, and offers free training and certification in the use of its products.

It also gives the labs access to "beta" or test versions of its education-applicable software for evaluation purposes. Hewlett-Packard, Compaq and Dell also support the teacher-training labs.

Another focus is distance-learning facilities such as The National Network of Educative Television (Ednet) and the Red Escolar (Scholastic Online Network), which RCE operates with government support, once again tapping into private-sector generosity for special prices on equipment.

The group's director, Guillermo Kefau, sees RCE's role as helping the government before education at a time when funds are scarce. "To bring education into the next century is not a project the government can do alone," he said. "We think the Mexican education system can reach a high level only with a concerted effort between the private sector and government institutions." Already RCE has made inroads into wiring Mexico for the next century. In Mexico City alone, the group has helped 1,000 schools obtain 25,000 PCs with fully loaded with software and Internet ready. And plans are afoot to help 2,000 schools outside the nation's population center purchase PCs.

RCE has earned the respect and praise of the private sector. In a time of intense global economic change that requires workers comfortable with digital technology, "RCE has given the country a real possibility to retrain in the classroom," says Microsoft Mexico's educational programs director Alejandro Flores.

Microsoft in Mexico: Future Gains from Education Investment

The case of Microsoft Mexico illustrates just how seriously the world's high-tech shiblers and movers take Mexican education. Virtually every personal computer sold in Mexico, whether for home or office use, runs Microsoft software. (Microsoft machines are used here mainly by a small cirk of graphic artists.) But the company began to see that traditional marketing methods could only do so much to increase business in a country with slipping purchasing power.

It's the Flores idea of using an educational program division within the Mexican subsidiary market a fundamental shift in company policy. "Microsoft's education division began on June 1, 1998, when our director, Felipe Sanchez, decided to invest in education. His idea was to invest in training, to help teachers teach better and students to learn better." Sanchez got the idea when he was working as the sales and marketing director for Microsoft's Northern Africa. Working in such poor countries as Algeria, Morocco, and Egypt, he realized that their markets had to be developed before realizing their profit potential for the company. And the way to develop them was by giving students access to computers which would later aid and help to aid. So when he returned to his Mexico City, he set up then online for all students - whether their parents drive Mercedes or donkey carts. The screen technology for electronic books is improving, and new equipment prices will come to rural areas. Besides, there are virtual library centers if the need for books is great enough. Libraries in rural areas, for example, could serve a TeleRural Library for books on topics of local interest and print them out (on inexpensive dot-matrix machines using recycled ribbons and the least expensive paper) be passed around from reader to reader. The elite may care about packaging, about leather-bound editions, the masses if need be could do quite well with just the words, thank you. Child request best to books on topics about which they were keen. The right books just might make the difference between a student and non-student.

"Two or three years ago, our main activity was marketing," Flores says. "Today we are much more focused on educational institutions. We are starting in the major population centers and moving out. We are interested in distance learning, higher education, and sending more equipment to schools." He said that in the first six months his division has focused on higher education institutions in the nation's big population centers, but that quite soon it would expand to all levels and all regions. "It doesn't matter if it's a school in Chiapas or (remote Mexico City neighborhood) Bosques de las Lomas. The idea is to invest in training, to help students learn and teachers teach."

In addition to RCE, Microsoft also works within the government's Campes Program, also designed to draw technology into schools. Under Campes, Microsoft gives schools the rights to a comprehensive software package at a cut rate. For 56 dollars per student per year, universities gain access to Microsoft's Windows NT, Office, Front Page and Business Studio. (It costs marginally more for primary and secondary schools.) Office alone costs 96 dollars on the market. Flores says, and the other programs quite a bit more. Although it only began early 1999, the program already encompasses 22 universities and 28 primary schools.

### How the Internet Can Be Used in Schools

David Rothman talks about a program that would put books online. It would be cheaper to have a digital library than for schools to buy a book per child. This excerpt is from Rothman's article called "How Corps and Wires Could Help Build National Pride, Not Just Wealth" at <http://www.infodiv.org/techbook.htm>

Besides the idea of an electronic Peace Corps, Mexico and other developing countries might consider another program in the information realm, a national digital library full of books that any schoolchild could take for free, or at least a much less cost than if such a library did not exist. Under [Digitals.com](http://digitals.com), as I've called it, books would be on the Internet or available through CD-ROM and similar technology. It is urgent for Mexico and other countries to work out with the intellectual property issues, rather than seeing the "pay per read" ethos ring unchanged. We cannot get everything online for free. But with books, especially, we should try as best we can for they encourage sustained thought - a prerequisite for the growth of meaningful democracy, not to mention the full development of the individual.

In today's era of paper, a network change of books exists, and now in Mexico [Patrick and Jennifer Duffy-Sing](http://www.digitals.com) recall their Peace Corps days in Uruguay, where "a teacher earned about 500 a month, a book cost over 1000, and teachers had no idea how to use the Net other than to send and receive electronic mail." In the United States, books aren't such luxuries, but in one recent year, the Shasta County library system in the state of California was spending 25 cents per year per citizen in tax money on books and other intellectual property. Meanwhile in the wealthy Los Angeles suburb of Beverly Hills, the library system has spent as much as \$34 per citizen, or more than 100 times as much as Shasta did. The answer is not to take away books from Beverly Hills or the elite sections of Mexico City, but to put them online for all students - whether their parents drive Mercedes or donkey carts. The screen technology for electronic books is improving, and new equipment prices will come to rural areas. Besides, there are virtual library centers if the need for books is great enough. Libraries in rural areas, for example, could serve a TeleRural Library for books on topics of local interest and print them out (on inexpensive dot-matrix machines using recycled ribbons and the least expensive paper) be passed around from reader to reader. The elite may care about packaging, about leather-bound editions, the masses if need be could do quite well with just the words, thank you. Child request best to books on topics about which they were keen. The right books just might make the difference between a student and non-student.

Yes, TeleRural-style national libraries would benefit academics. Funding woes have been university libraries throughout the world. Even in the United States and Canada, some universities are cutting back on the number of subscriptions to scholarly publications because publishers are charging them excessively. Some scholars are publishing directly on the Web, of course. But, as much as I love the Web, it is not a substitute for a library. The right information can be hard to find, and in most cases there are not the usual mechanisms for evaluating the quality of the information.





# Steps to a Solution

Sin embargo, si un investigador independiente o un estudiante inscrito en alguna de las universidades participantes a CUDI desea colaborar en el proyecto, se recomienda acercarse a los departamentos, institutos o laboratorios comprometidos con la creación e innovación de aplicaciones.

**¿Existen organismos semejantes a CUDI en otros países?**

Si, de hecho, una de las razones que hizo necesario la creación de CUDI es el hecho de que los organismos de representación nacional sólo pueden establecer conexiones internacionales con organizaciones homólogas y no con universidades o empresas en particular.

**¿Se tienen convenios con organizaciones internacionales?**

Si, se han firmado memorandos de entendimiento (MoU) con UCAD y CENIC.

**¿Internet 2 desplazará a la Internet comercial actual?**

El proyecto Internet 2 no reemplazará a la Internet actual. Su objetivo es unir a las instituciones con los recursos para desarrollar nuevas tecnologías y posibilidades que posteriormente puedan exportarse a la Internet global. Las universidades mantendrán y continuarán teniendo un crecimiento substancial en el uso de las conexiones existentes de Internet, que podrán seguir obteniendo de sus proveedores comerciales.

Aún más, el sector privado se beneficiará con las aplicaciones y tecnología desarrolladas por los miembros de Internet 2. Hoy en día, las universidades e institutos de investigación han hecho inversiones y esfuerzos considerables encaminado a conectar la mayor parte de sus instalaciones a la Internet comercial, dicha inversión y esfuerzo no puede ser desperdiciado.

**¿Y qué de las instituciones educativas que no son miembros de la Internet2?**

La participación en la Internet2 está abierta para cualquier universidad que se comprometa a proveer facilidades para el desarrollo de aplicaciones avanzadas en su campus. La inversión financiera requerida para cumplir con estas obligaciones pueden ser más de lo que muchas instituciones puedan permitir por ahora. Sin embargo, la Internet 2 tiene la intención de acelerar la transmisión de nuevas posibilidades a la comunidad mayor del sistema de redes. El costo de la tecnología usada y desarrollada por Internet 2 disminuirá a un nivel alcanzable para cualquier institución que actualmente tenga una conexión básica a la Internet.





# México

*The Information Revolution in Latin America  
Obstacles and Opportunities through the Internet*

## Conclusion: Barriers to the Internet in Education

Education is one of the main sectors where Internet and computer development in Mexico must be concentrated. In elementary and secondary schools, children will learn the basics of how a computer and the Internet work. Then they will take this knowledge and unlock a world of potential. Children will be interacting with other children throughout the world; they will be browsing libraries in Venice; they will be reading about the latest Asian news not available in their local newspapers. How children apply what they learn about Internet usage is where the real changes will be seen in Mexico. By having the opportunity to acquire the ability to learn about the Internet, children will be able to go and further their education at technical schools or work at a technical profession. For university students, the Internet provides many opportunities necessary for up-to-date education. Email and constant Internet access are necessities for college students to have access to research information and to have the ability to interact with other scholars worldwide.

One of the main reasons the situation described above is not in place in Mexico today is money. For Mexico to catch up and leap-frog to a situation similar to the United States would require huge amounts of money that is not available. But the programs that have been started in Mexico, such as Red Escolar, "Scholar Net," CUDI and the programs developed by the ILCE are leading to a larger distribution of computers in Mexican schools and a greater availability of Internet access.

These programs have Mexico on the right track; however, they are still in their early stages. Regardless, they will improve the number of computers with Internet access in Mexican schools. Education is one of the primary building blocks for where to implement the Internet because the knowledge spreads far beyond the school and permeates society.

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# México:

## Obstacles and Opportunities Through the Internet



CS 377C: Dr. Morrison, Dr. Winograd  
Jesse Cuevas, Gustavo Guevara, Kim Cowan, Brian Bird  
12 February 2001



# Overview

Education: Internet and Technology Issues in Elementary and Secondary Education

Higher Education: The Field of Computer Science

E-Commerce: Challenges and Accomplishments

Internet Access: Current Status and Future Goals



# Elementary and Secondary Education

Overview and Background Information

Governmental Programs and Procedures

Elementary and Secondary School Breakdown

The Future



# Background Information

## *Literacy Rates:*

Breakdown by age, sex, and location.

## *Drop Out Rates:*

Breakdown by nation and by rich vs. poor.

## *Student Enrollment:*

Breakdown by school level and age.

## *Internet Usage*

Breakdown by Educational Sector



# Governmental Programs/Procedures

## *Teacher Training:*

Government and corporate sponsored.

## *Funding and Improvement of System:*

Priority of location for educational funding;  
priority of technology in educational funding;  
educational standards and technology;  
Red Escolar.

## *Keeping Children in School:*

Successful program to pay parents for children that stay in school.

## *Technology and the Internet in Practice:*

Group of schools in Mexico City linked with schools in San Diego for language skills.



# Elementary Schools

## *Background Information:*

Student, school, teacher and spending statistics.  
Public vs. Private.

## *Technology and the Internet:*

Lack of information on public elementary schools  
with Internet;  
Some private schools with Internet.

## *Example:*

The American School Foundation:  
Computers are integrated into the daily curriculum.



# Secondary School

## *Background Information:*

Student, school, teacher and spending statistics.  
General vs. Technical

## *Technology and the Internet:*

Lack of information on public secondary schools  
with Internet;  
Some private schools with Internet.



# The Future

*Making the Internet More Widespread:*  
So few public schools have Internet

*Implications of Internet:*  
“Elite” class is formed.  
Ease at which children can teach others.

*Future of this Project:*  
Comparisons of educational systems;  
Interaction with specific schools.





# Computer Science Education

University Enrollment

Computer Science Programs and Students

Quality of Education and Programs to Improve It

Conclusions



# Attendance Rates in Mexican Universities

High drop out rates

Economic limitations for students



# Lack of Computer Science Students

488,600 students enrolled in technology related programs, but only a fraction in CS programs

Traditional notions of prestige drive students away from computer science major.



# Great Disparity in Quality of Computer Science Education

Elite universities provide technical programs similar to U.S. programs (i.e., Stanford)

Rest of schools have limited resources; therefore, computers and programs are outdated.



# Universities are Oftentimes Not Providing Education in Tune With the Country's Needs

## Supply vs. Demand

Shortage of certain computer specialists on a national level due to deficiencies in university programs.

Result: foreign companies now provide certification programs throughout Latin America, including Mexico.



# Secretary of Public Education

Scholarships

Increased education funding

Technical programs



# Conclusion

Bottom Up Approach



# E-Commerce

The Internet Market

Telmex Dominance and ISPs

Costs and Legal Battles

Possible Future





# Internet Market

Over a million people online 1999 - about 1% of population

Proximity to U.S. eases market access and lowers transmission costs

Growth - 8 million Mexicans online by 2003, 13 million by 2005

1 out of 9 Mexicans, 1 out of 6 in Chile, Arg. and Brazil

Low per capita GDP and lack of competitive access market hinder growth



# Telmex Dominance

Telmex, the former national phone company of Mexico, owns 98% of 11 million phone lines.

Mexico Advantage: calls not metered

MCI Worldcom (Avantel) and AT&T (Alestra) both offer long distance and a few local operators, but competition in name only.

Telmex anti-competitive practices: inflating subscribers, intentional disconnections, denying line access

Cofetel has been unable to impose guidelines



# ISPs

Many ISPs, but little competition.

Cofetel - 11 states have at least 30 ISPs and D.F. has 100

Telmex's 350,000 subscribers are more than half (Prodigy)

Next biggest ISP, Infosel, has 65,000 subscribers as of January 2000



# Costs Decreasing

Consumer access costs remain higher than in Argentina and Brazil (\$25/mo.unlimited)

Consumers not satisfied, competitors should enter market and prices should fall



# Legal/Regulatory Battles

Recent dominant carrier regulations and pressure from the WTO adding to uncertainty; increasing competitive forces.

Cofetel, the national telecom regulatory body, has been battling Telmex in court for three years but is now showing success.

Last month, Telmex, Avantel (MCI Worldcom) and Alestra (AT&T) signed a major agreement to purportedly end all legal battles which have paralyzed the industry since it was opened to competition in 1997.

Roland Zubiran "This agreement resolves all the disagreements of the past that constituted a barrier to the modernization of our telecommunications market."

Avantel and Alestra agreed to pay \$137MM in fees, Telmex has agreed to reduce future fees and provide access



# Futures

Avantel and Alestra moving into local phone markets

U.S. pushing to lower international rates  
(\$ .19/minute vs. \$.06/minute Canada)



# Let's Get Technical

- Background
- Portals
- ISP's
- Infrastructure
- Internet Culture



# Background Information

- Websites (web-developer's point of view)
  - Professional looking
    - Well designed
    - Secure (ssl, encryption, etc)
  - Dynamic, Good Content
    - News, Search Engines, etc.
    - Consistent and Accurate information
    - Straightforward shopping
  - Website needs to be "friendly"
    - If too much movement, dizziness effect (want to leave site)
    - Few advertisements



# Portals

- Critique as Website:
  - Todito ([todito.com](http://todito.com))
    - Very flashy, a lot of movement
    - Large use of Flash, JavaScript
  - Yupi ([mx.yupi.com](http://mx.yupi.com))
    - Good, clean, professional
    - Banners need to be less attention grabbing
  - Yahoo ([www.yahoo.com.mx](http://www.yahoo.com.mx))
    - Professional looking
    - Effect of being Translated



# Portals

- Critique as Store:
  - Todito and Yupi
    - “Links” to other company’s sites
    - Not appealing, out of the “comfort zone”

# ISPs

- Telmex
  - ISDN exclusive
  - Last mile connection for others
- Terra (terra.com.mx) aka Infosel
  - Terra Libre – Free Access
- Avantel
  - Eases ISP startup costs
- Cable companies
  - Shared access, slows down
- Others - Dial-up (~150)
  - Speeds of 53Kbps/33.6Kbps (download/upload) are typically not reached

# Infrastructure (Fiber Optics)

- Telmex
  - Star Configuration
  - If a line gets cut, signal will die
  - Established system, costly to replace
- Avantel
  - Circular Configuration
  - If a line gets cut, signal will continue
  - New system, very costly to lay down
  - Rumors of 2 x 155 Mbps

# E-commerce

- To buy products online, there has to be an advantage over retail stores:
  - Price + Shipping = Lower overall cost
  - Hard to find products
  - Logistics
    - Time to get product to you
- Reputation – Comfort Zone
  - Warranty
  - Customer Service

# Why would you use any of these?

- Charge on Delivery (COD)
  - take personal check at time of delivery
  - 1.75% surcharge over total
- Deposit into their bank account
  - Buy online, go to bank, deposit into their account, wait for delivery.
  - Takes longer than going to store
- Visa/ Mastercard
  - Interest rates are sky high

# Virtual Communities

- Vast majority of Instant messaging users use MSN Messenger/ Hotmail
  - Portable
    - Can use any computer that has Messenger installed
    - Contact list remains the same
      - Unlike competitors, don't have local files
    - Hotmail e-mail notification/ interaction
      - Hotmail (portable e-mail)
  - Not everyone has internet access
    - Convenient to chat/ check e-mail on any computer
      - Your own home
      - Cyber-Café
      - Friend's home
      - Work

# Conclusions

- Portals need to better content, presentation
- ISP's - Telmex will slowly surrender to Terra, Avantel
- E-Commerce
  - Easier to buy from retail store
  - Telephone in Credit Card information
- Communities - 'Portable' solutions are best





# Overall Conclusions

- Education: How to Implement the Internet into Primary and Secondary Education
- University Education: The Future of Computer Science Degrees
- E-Commerce: What Lies Ahead...
- Internet Access: Goals



# México

*The Information Revolution in Latin America  
Obstacles and Opportunities through the Internet*

- Jesse Cuevas, Kim Cowan,  
Brian Bird, Gustavo Guevara
  - March 16, 2001
  - <http://www.stanford.edu/~gguevara/>

# Objectives

- **Telmex's role in Internet Development**
  - How their Monopoly has affected Technology
  - How new agreement will affect Telecom industry
- **Education**
  - Barriers to Internet exposure in schools
  - Find current solutions
  - Give an outlook of the future









# Telmex

- Revenues last 12 months: \$11.2B
- Profit last 12 months: \$2.67B
- Profit Margin: 24%
- 63,000+ employees in 373 branches
- Numerous Subsidiaries



# Telmex Objectives

- Remain market leader in telecom and related industries
- Leverage last mile infrastructure to control telephone markets
- Buy small companies and clients (Prodigy)
- Cross sell and bundle phone and internet service
- Low cost PC distribution
- Expand with subsidiaries and partnerships



# Subsidiaries

- Anuncios en Directorios
- Red Uno
- Telnor
- Telcel
- Uninet
- Telbip
- Kb/TEL
- Tut Systems, Inc
- America Movil, Inc

# Avantel

- Telecom since 1997
- has made investments of over \$2 billion
- Has over 2,000 employees
- A joint venture
  - Grupo Financiero Banamex-Accival (55%)
  - MCIWorldcom (45%)



# Avantel Objective

- Avantel is aggressively competing to take advantage of the huge forecast growth in Mexico and challenge Telmex
- First mover in telecommunications technology
- Avantel currently seeks to capture 35% of the telecom market



# Avantel Products

- Avantel has recently introduced packet services
- Avantel Local launched in 1999
- Begin local telephone service in D.F., Monterrey, and Guadalajara in 2001
- Avantel Internet -email account, 5Mb of web space

# Infrastructure

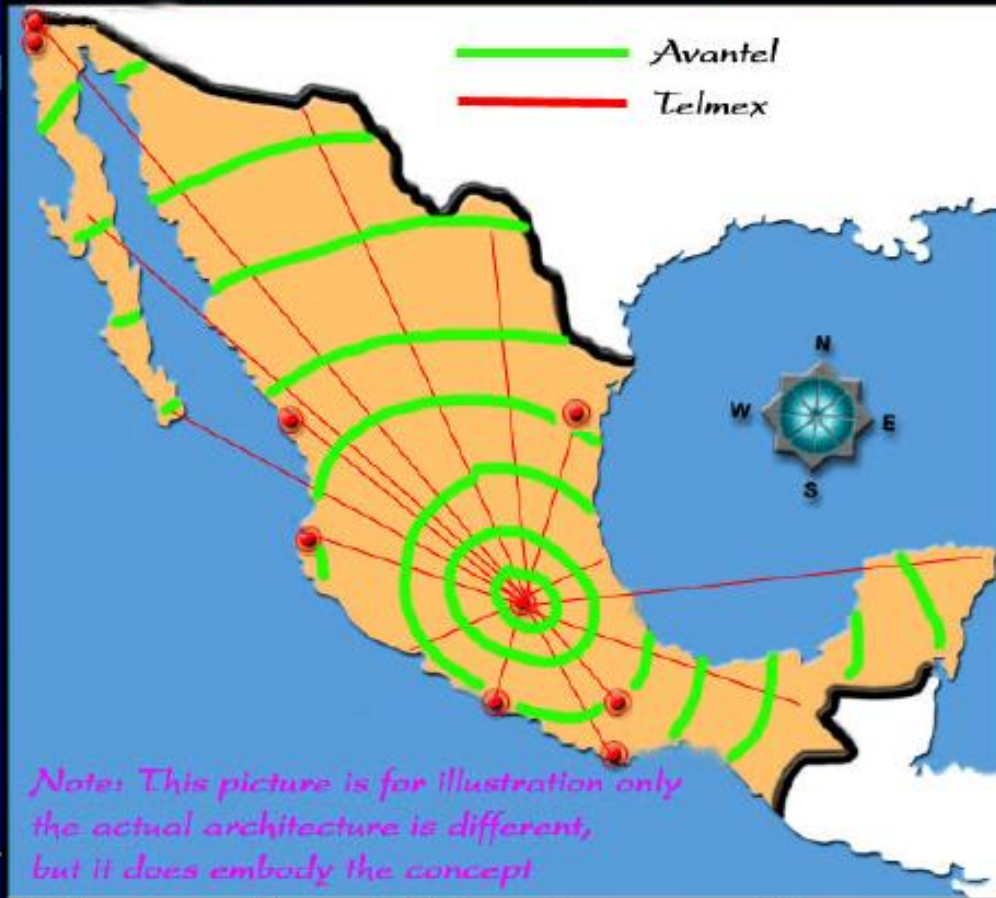
- Avantel initially invested \$1B
- New investment of \$1.2B over the next four years
- Current \$650M project
  - Construct a fiber optic network around Guadalajara, Monterrey, and Mexico City (75% of overall traffic).
- Currently, Avantel has a 6,300 km optical fiber network
- Avantel's Internet backbone reaches speeds of more than 1.0 Gbps with 99.98% reliability

# Infrastructure



- Lower network connection fees ease cost
- 3 Free ISPs available (Terra, Todito, StarMedia)
- Fixed cost of local calls (charged once per call)
- Question of “Last Mile”
  - With Avantel competing in local markets, access should improve greatly, with lower cost

# Infrastructure



# Wireless ?



- In main urban areas, infrastructure is excellent
  - Only question of getting the last mile
  - ISDN, Cable, E1, DSL, etc.
- Outside main urban areas
  - Wireless is not the answer...
  - Why? Wireless still requires somewhat of a backbone (ie. Microwave antennas, with relays, so need a lot of expensive hardware)
  - What to do? Satellite!

\$200 - 400 (satellite) + \$1000's (installation of



# Telmex / Avantel / Alestra



# **Telmex, Worldcom (Avantel), and AT&T (Alestra)**

- Have been fighting in court for four years
- January 18 Agreement: spur competition and quality
  - Telmex drops charges when others pay \$60 MM past due
  - Telmex charges 75% of lowest commercial rate for last mile connections
  - Others get rights to international calls
  - Stop rerouting of traffic and other



# Fox and the Internet

- Fox wants to double the number of phone lines in 5 years
- Reform telecommunications laws
- His election caused a surge in U.S. and European venture capital
- Fox has pledged 7% economic growth through deregulation and foreign investment

(including the Internet)

# Information Technology: Education

- 1,200 companies with IT managers
  - 72% in Mexico City
- 160,000 B.A. level students – 6.56% majoring in CS (~10,500)
- Post Graduate Programs for IT



# Current Problems in Mexican Schools

- Internet use has doubled in recent years, will drop in schools as percentage of whole
- Growth is limited to private institutions
- Limited access to majority of population
- Internet use not for Academic purposes



# Theories About Integrating the Internet

- Three Step Theory - Heather Hudson
  - Public Internet: libraries, telecenters, etc.
  - Institutional Internet: schools, universities, etc.
  - Home Internet
- Carlos Slim's Plan
  - "... make sure that every school in Mexico has a computer and Internet access..."

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## Notes:

### Steps to a Solution:

The first step is community integration and includes the availability of the Internet at libraries, telecenters or other public places. The second step is institutional integration and includes schools. The final step is home integration.

### Carlos Slim's Plan:

We're negotiating with the Education Secretariat to make sure that every school in Mexico has a computer and Internet access. In order for our countries to emerge from backwardness, it's very important that everyone participate in this digital technology culture and the Internet. Spreading that culture is fundamental for our long-term development.

# Red Escolar and “Scholar Net”

<http://reasescolar.ilce.edu.mx>

- Purpose: To improve the quality of education in Mexico by allowing children and teachers to share experiences and gather information via the Internet
- How it works: government funds for hardware plus free software - Linux
- Schools are provided with computers, Internet access, an antenna, a VCR and access to educational content via satellite and the Internet
- 25,000 schools have the antenna and 2,500 the Internet



Slide 55 of 64

## Notes:

### Red Escolar and “Scholar Net”

“Scholar Net” is a program started by the distributors of Linux that works with the Red Escolar program started by the Mexican government with the purpose of bringing computers and the Internet to all public elementary and secondary schools throughout Mexico in order to raise the quality of education. The program was established in the late 1990s. Children would also be able to take advantage of the host of opportunities available through computers and the Internet ranging from information databases to email to computer programs. Another goal of this program is to train children to have the skills necessary to continue to a technical school or to work toward a technical profession. It also looks to inform the student population as a whole of what opportunities are available through computers and the Internet. One major

economic step taken by these programs is that Linux is the operating system put on the computers in Mexican schools. The OS and programs for it are entirely free and can be downloaded from the Internet.



# Red Escolar and “Scholar Net”

- Three Goals of the program:
  - Information Access – Secretary of Education has set up a digital database with research information and multimedia resources
  - Communications – Professors can share theories and instructional methods; students can share experiences and ideas
  - Development of Educational Projects – Children work in groups and develop projects; samples can be submitted to the



# Tachyon.net

- Offers two way Internet service via Satellite (!)
- Available throughout Mexico
- Can offer broadband Internet to a school with 5-10 computers for \$300-400 a month
- Uses Linux

Slide 57 of 64

## Notes:

Tachyon.net

Tachyon is offering inexpensive two-way Internet service via satellite, and it can serve every town and village in Mexico right now. Its price for broadband Internet connectivity for a typical Mexican school with five to 10 computers is only about \$300 to \$400 per month. The ground equipment Tachyon provides its customers runs on Linux.



# Electronic Peace Corps

- Presented by David Rothman
- Worldwide implications
  - Provide a model for other countries
- Tec and other university graduates
  - Looking to solidify job experience
- Older people
  - Looking to train with new technology to remain current with job requirements

Slide 58 of 64

## Notes:

### Electronic Peace Corps

And today I'll go a step beyond and suggest that Mexico lead the way for the rest of the planet and establish a domestic Electronic Peace Corps that, if successful, could also offer help to other countries and someday work with an International or United Nations Electronic Peace Corps. Let Washington catch up with Mexico City. The sooner Mexico starts its own Electronic Peace Corps, the more easily I can persuade the United States to establish one. Quite a few of members of the Mexican Electronic Peace Corps would be graduates of ITESM and other Mexican universities, or maybe students taking breaks from their regular studies. Older people could participate, too. In fact, many of the Corps members could be telephone workers taking time off from their regular jobs to gain new technical and business skills. Clearly, in many

respects, the Mexican Electronic Peace Corps could be an international effort. But Mexican citizens would comprise most of this Electric Peace Corps and set its goals.



# TeleRead

- Presented by David Rothman
- National digital library for children available over Internet or CD-ROM
- Cheaper than buying books
  - No printing costs
  - Can print only the desired text using old printers

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## Notes:

### TeleRead

A national digital library full of books that any schoolchild could read for free, or at least at much less cost than if such a library did not exist. Under TeleRead, as I've called it, books would be on the Internet or available through CD-ROM and similar technologies. Librarians in rural areas, for example, could scour a TeleRead library for books on topics of local interest and print them out (on inexpensive dot-matrix machines using recyclable ribbons and the least expensive paper) to be passed around from reader to reader. The elite may care about packaging, about leather-bound editions; the masses if need be could do quite well with just the words, thank you.

# ILCE

- Latin American Institute for Communicative Education
- Subsidizes computer purchases for schools
- Runs training labs for teachers
- "To bring education into the next century is not a project the government can do alone ..."

• Guillermo Kelley

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## Notes:

### ILCE

The Latin American Institute for Communicative Education (ILCE), a non-profit organization founded in 1956 to improve the region's ability to negotiate communication technology. ILCE subsidizes the purchase of equipment and software for schools. ILCE in turn works out special-price deals with computer manufacturers. ILCE has also set up training labs, using equipment donated or subsidized by high-tech firms, to train teachers in the ways of technology. Microsoft, for example, has donated its Visual Studio Enterprise Edition software for use in the labs, and offers free training and certification in the use of its products.

The group's director, Guillermo Kelley, sees ILCE's role as helping the government bolster education at a

time when funds are scarce. "To bring education into the next century is not a project the government can do alone," he said. " We think the Mexican education system can reach a high level only with a concerted effort between the private sector and government institutions." Already ILCE has made inroads into wiring up Mexico for the next century. In Mexico City alone, the group has helped 3,000 schools obtain 25,000 PCs-all fully loaded with software and Internet-ready. And plans are afoot to help 2,000 schools outside the nation's population center purchase PCs.

# CUDI

- La Corporación Universitaria para el Desarrollo de Internet
- Works to develop Internet 2
- Faster connect to share academic information between institutions

Slide 61 of 64

## Notes:

### CUDI

La Corporación Universitaria para el Desarrollo de Internet (CUDI) works to promote the development of a scientific and educational high speed network known as Internet 2. This network will provide faster connections for the sharing of information between academic institutions. In this way, investigators, professors and students of the Mexican institutions of higher education will be able to handle more complex information at higher speeds and without reception problems; they will be able to consult world-wide information banks, digital libraries and national and international super-computers. There will also be a meteorological area and another dedicated to tele-medicine.



# Barriers to the Internet in Education

- Education is most important place to establish the Internet
  - Results of education permeate society
- Money is major barrier
  - Many programs involving Government and corporate aid to solve this problem
- Future looks bright





# EZLN

<http://www.ezln.org/>

- Zapatista Army for National Liberation
- January 1, 1994 launched campaign for indigenous rights
- Effectively avoided government efforts to isolate and disband
- Today, they are marching towards Mexico City from Chiapas
- How did they do this?
  - Answer: The internet.  
Got their purpose and objectives out to the rest of the world to effectively gain emotional and economic support.

# Conclusions

- New Administration has/will change
  - Telecommunications
  - Government Regulations
- Telmex
  - Is losing monopoly; competition is increasing
  - Avantel has advantages: quality, price, product differentiation, infrastructure
- Infrastructure
  - Will improve with Avantel's investment
  - Competition will improve technology
- Education
  - Programs headed in the right direction
  - Current barriers include funding and time



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## . Infrastructure

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## . Overall – Development is increasing rapidly!

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<http://resescolar.ilce.edu.mx>

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- Home Internet

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- "...make sure that every school in Mexico has a computer and Internet access..."

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- **Post Graduate Programs for IT**

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  - . His election caused a surge in U.S. and European venture capital**
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- (including the Internet)**

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# Telmex / Avantel / Alestra

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# Wireless ?

## . In main urban areas, infrastructure is excellent

- Only question of getting the last mile
- ISDN, Cable, E1, DSL, etc.

## . Outside main urban areas

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- 
- \$300 – 400 (satellite) < \$1000's (installation of hardware)

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# Infrastructure

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# Infrastructure

- 
- **Lower network connection fees ease cost**
- **3 Free ISPs available (Terra, Todito, StarMedia)**
- **Fixed cost of local calls (charged once per call)**
- **Question of “Last Mile”**
  - With Avantel competing in local markets, access should improve greatly, with lower cost
- **Computer packages with unlimited internet**
  - Being offered by Prodigy, Todito, and others
  - Long term loan with fixed interest rate

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# Infrastructure

- . Avantel initially invested \$1B**
- . New investment of \$1.2B over the next four years**
- . Current \$650M project**
  - Construct a fiber optic network around Guadalajara, Monterrey, and Mexico City (75% of overall traffic).
- . Currently, Avantel has a 6,300 km optical fiber network**
- . Avantel's Internet backbone reaches speeds of more than 1.0 Gbps with 99.98% reliability.**

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# Avantel Products

- . Avantel has recently introduced packet services**
- . Avantel Local launched in 1999**
- . Begin local telephone service in D.F., Monterrey, and Guadalajara in 2001**
- . Avantel Internet -email account, 5Mb of web space**

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# Avantel Objective

- . Avantel is aggressively competing to take advantage of the huge forecast growth in Mexico and challenge Telmex**
- . First mover in telecommunications technology**
- . Avantel currently seeks to capture 35% of the telecom market**

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# Avantel

- . Telecom since 1997**
- . has made investments of over \$2 billion**
- . Has over 2,000 employees**
- . A joint venture**
  - Grupo Financiero Banamex-Accival (55%)
  - MCIWorldcom (45%)

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# Subsidiaries

- . **Anuncios en Directorios**
- . **Red Uno**
- .
- . **Telnor**
- .
- . **Telcel**
- .
- . **Uninet**
- . **Telbip**
- . **Kb/TEL**
- . **Tut Systems, Inc**
- . **America Movil, Inc**

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# Telmex Objectives

- . Remain market leader in telecom and related industries**
- . Leverage last mile infrastructure to control telephone markets**
- . Buy small companies and clients (Prodigy)**
- . Cross sell and bundle phone and internet service**
- . Low cost PC distribution**
- . Expand with subsidiaries and partnerships**

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# Telmex

- . Revenues last 12 months: \$11.2B**
- . Profit last 12 months: \$2.67B**
- . Profit Margin: 24%**
- . 63,000+ employees in 373 branches**
- . Numerous Subsidiaries**

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# PPT Slide

Fox

2000 - 2006

Zedillo

1994 - 2000

Salinas

1988 – 1994

WTO US trade representative pressures Fox into resolving agreement between Telmex, Avantel, Alestra

Threat of no foreign investment too large, COFETEL eases agreement

January 18, 2001 – Agreement formed

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# PPT Slide

Zedillo

1994 - 2000

Salinas

1988 – 1994

Fox

2000 - 2006

Zedillo not appointed through “dedazo”

Period of separation of interests between the government and Telmex

1996 Avantel Formed

1997 Telecom Market open to competitors

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# PPT Slide

Salinas

1988 – 1994

Zedillo

1994 - 2000

Fox

2000 - 2006

1990 – Carlos Slim Helú makes successful bid of \$1.76B to privatize Telmex

Big Monopoly starting to be formed

Smaller companies being bought out:

PRI (Salinas) + Telmex (Slim) = Good relationship & \$\$\$

Ie. RedUno, Cablevisión, Copper cable company

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# Objectives

## . Telmex's role in Internet Development

- How their Monopoly has affected Technology
- How new agreement will affect Telecom industry

## . Education

- Barriers to Internet exposure in schools
- Find current solutions
- Give an outlook of the future

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# PPT Slide

## . Jesse Cuevas, Kim Cowan, Brian Bird, Gustavo Guevara

- March 16, 2001
- <http://www.stanford.edu/~gguevara/mexico/>

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# Overall Conclusions

- **Education: How to Implement the Internet into Primary and Secondary Education**
- 
- **University Education: The Future of Computer Science Degrees**
- 
- **E-Commerce: What Lies Ahead...**
- 
- **Internet Access: Goals**

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# Conclusions

- **Portals need to better content, presentation**

- 

- **ISP's - Telmex will slowly surrender to Terra, Avantel**

- 

- **E-Commerce**

- Easier to buy from retail store
- Telephone in Credit Card information

- **Communities - 'Portable' solutions are best**

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# Virtual Communities

## . Vast majority of Instant messaging users use MSN Messenger/ Hotmail

- Portable
- Can use any computer that has Messenger installed
- Contact list remains the same
- Unlike competitors, don't have local files
- Hotmail e-mail notification/ interaction
- Hotmail (portable e-mail)
- Not everyone has internet access
- Convenient to chat/ check e-mail on any computer
- Your own home
- Cyber-Café
- Friend's home
- Work

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# Why would you use any of these?

## . Charge on Delivery (COD)

- take personal check at time of delivery
- 1.75% surcharge over total

## . Deposit into their bank account

- Buy online, go to bank, deposit into their account, wait for delivery.
- Takes longer than going to store

## . Visa/ Mastercard

- Interest rates are sky high

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# E-commerce

## . To buy products online, there has to be an advantage over retail stores:

- Price + Shipping = Lower overall cost
- Hard to find products
- Logistics
  
- Time to get product to you

## . Reputation – Comfort Zone

- Warranty
- Customer Service

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# Infrastructure (Fiber Optics)

## . Telmex

- Star Configuration
- If a line gets cut, signal will die
- Established system, costly to replace

## . Avantel

- Circular Configuration
- If a line gets cut, signal will continue
- New system, very costly to lay down
- Rumors of 2 x 155 Mbps

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# ISPs

## . **Telmex**

- ISDN exclusive
- Last mile connection for others

## . **Terra (terra.com.mx) aka Infosel**

- Terra Libre – Free Access

## . **Avantel**

- Eases ISP startup costs

## . **Cable companies**

- Shared access, slows down

## . **Others - Dial-up (~150)**

- Speeds of 53Kbps/33.6Kbps (download/upload) are typically not reached

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# Portals

## . Critique as Store:

- Todito and Yupi
- “Links” to other company’s sites
- Not appealing, out of the “comfort zone”

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# Portals

## . Critique as Website:

- Todito (todito.com)
- Very flashy, a lot of movement
- Large use of Flash, JavaScript
- Yupi (mx.yupi.com)
- Good, clean, professional
- Banners need to be less attention grabbing
- Yahoo (www.yahoo.com.mx)
- Professional looking
- Effect of being Translated

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# Background Information

## . Websites (web-developer's point of view)

- Professional looking
- Well designed
- Secure (ssl, encryption, etc)
- Dynamic, Good Content
- News, Search Engines, etc.
- Consistent and Accurate information
- Straightforward shopping
- Website needs to be “friendly”
- If too much movement, dizziness effect (want to leave site)
- Few advertisements

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# Let's Get Technical

- Background
- Portals
- ISP's
- Infrastructure
- Internet Culture

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# Futures

Avantel and Alestra moving into local phone markets

U.S. pushing to lower international rates

(\$.19/minute vs. \$.06/minute Canada)

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# Legal/Regulatory Battles

Recent dominant carrier regulations and pressure from the WTO adding to uncertainty; increasing competitive forces.

Cofotel, the national telecom regulatory body, has been battling Telmex in court for three years but is now showing success.

Last month, Telmex, Avantel (MCI Worldcom) and Alestra (AT&T) signed a major agreement to purportedly end all legal battles which have paralyzed the industry since it was opened to competition in 1997.

Roland Zubiran “This agreement resolves all the disagreements of the past that constituted a barrier to the modernization of our telecommunications market.”

Avantel and Alestra agreed to pay \$137MM in fees, Telmex has agreed to reduce future fees and provide access

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# Costs Decreasing

Consumer access costs remain higher than in

Argentina and Brazil (\$25/mo.unlimited)

Consumers not satisfied, competitors should enter

market and prices should fall

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# ISPs

Many ISPs, but little competition.

Cofetel - 11 states have at least 30 ISPs and D.F. has 100

Telmex's 350,000 subscribers are more than half (Prodigy)

Next biggest ISP, Infotel, has 65,000 subscribers as of

January 2000

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# Telmex Dominance

Telmex, the former national phone company of Mexico,

owns 98% of 11 million phone lines.

Mexico Advantage: calls not metered

MCI Worldcom (Avantel) and AT&T (Alestra) both offer long distance and a few local operators, but competition in name

only.

Telmex anti-competitive practices: inflating subscribers, intentional disconnections, denying line access

Cofetel has been unable to impose guidelines

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# Internet Market

Over a million people online 1999 - about 1% of population

Proximity to U.S. eases market access and lowers

transmission costs

Growth - 8 million Mexicans online by 2003, 13 million by 2005

1 out of 9 Mexicans, 1 out of 6 in Chile, Arg. and Brazil

Low per capita GDP and lack of competitive access market hinder growth

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# E-Commerce

The Internet Market

Telmex Dominance and ISPs

Costs and Legal Battles

Possible Future

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# Conclusion

Bottom Up Approach

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# Secretary of Public Education

Scholarships

Increased education funding

Technical programs

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# Universities are Oftentimes Not Providing Education in Tune With the Country's Needs

Supply vs. Demand

Shortage of certain computer specialists on a national

level due to deficiencies in university programs.

Result: foreign companies now provide certification programs throughout Latin America, including Mexico.

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# Great Disparity in Quality of Computer Science Education

Elite universities provide technical programs similar to U.S. programs (i.e., Stanford)

Rest of schools have limited resources; therefore, computers and programs are outdated.

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# Lack of Computer Science Students

488,600 students enrolled in technology related

programs, but only a fraction in CS programs

Traditional notions of prestige drive students away

from computer science major.

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# Attendance Rates in Mexican Universities

High drop out rates

Economic limitations for students

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# Computer Science Education

University Enrollment

Computer Science Programs and Students

Quality of Education and Programs to Improve It

Conclusions

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# The Future

Making the Internet More Widespread:

So few public schools have Internet

Future of this Project:

Comparisons of educational systems;

Interaction with specific schools.

Implications of Internet:

“Elite” class is formed.

Ease at which children can teach others.

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# Secondary School

Background Information:

Student, school, teacher and spending statistics.

General vs. Technical

Technology and the Internet:

Lack of information on public secondary schools

with Internet;

Some private schools with Internet.

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# Elementary Schools

Background Information:

Student, school, teacher and spending statistics.

Public vs. Private.

Technology and the Internet:

Lack of information on public elementary schools

with Internet;

Some private schools with Internet.

Example:

The American School Foundation:

Computers are integrated into the daily curriculum.

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# Governmental Programs/Procedures

Teacher Training:

Government and corporate sponsored.

Funding and Improvement of System:

Priority of location for educational funding;

priority of technology in educational funding;

educational standards and technology;

Red Escolar.

Keeping Children in School:

Successful program to pay parents for children that stay in school.

Technology and the Internet in Practice:

Group of schools in Mexico City linked with schools in San Diego for language skills.

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# Background Information

Literacy Rates:

Breakdown by age, sex, and location.

Drop Out Rates:

Breakdown by nation and by rich vs. poor.

Student Enrollment:

Breakdown by school level and age.

Internet Usage

Breakdown by Educational Sector

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# Elementary and Secondary Education

Overview and Background Information

Governmental Programs and Procedures

Elementary and Secondary School Breakdown

The Future

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# Overview

E-Commerce: Challenges and Accomplishments

Internet Access: Current Status and Future Goals

Education: Internet and Technology Issues in Elementary  
and Secondary Education

Higher Education: The Field of Computer Science

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# México:

Obstacles and Opportunities

Through the Internet

CS 377C: Dr. Morrison, Dr. Winograd

Jesse Cuevas, Gustavo Guevara, Kim Cowan, Brian Bird

12 February 2001

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