The Information Revolution in Latin America: The Case of Peru

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The Information Revolution in Latin America:

The Case of Peru

Research Report: December 6, 1999

Views: [Overview | Presentations | Index | Charts]

Welcome to the *The Information Revolution in Latin America: The Case of Peru*. This Web site presents the result of Team Peru's research on the obstacles and opportunities presented by the development of the Internet in Peru. Our research is organized by topic, but it is also possible to view it as three presentations: (1) Education, Labor Markets and Technical Capacity, (2) Creating Internet Opportunities, and (3) The Main Event -- RCP vs. Telefonica.

We began our research by assessing the context of Peru in terms of geography, labor, and education. We attempted to understand the present technical capacity of the country as relevant to Internet development, and to estimate the ability of the population to realize that capacity.

Next, we assess Peru's telecommunications policy, intellectual property protection, and sources of financing for potential Internet ventures. We briefly cover the history of telecommunications policy in Peru, as well as more recent reform legislation. Throughout our analysis, one of the most interesting actors is the non-profit Red Cientifica Peruana (RCP). In the latter part of our analysis, we contrast the progressive vision of RCP with the financial and organizational might of the dominant telecommunications carrier, Telefonica del Peru, a former state-owned monopoly. Finally, we present overall conclusions on this topic.

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CS 377C - CLAS 194, Fall 1999, Stanford University

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This page lists the results of our research, ordered by the in-class oral presentations we have given.

Presentation 1
Education, Labor Markets and Technical Capacity

Given Monday, 25 Oct 1999 [View Slides for this Presentation]

Presentation 2
Creating Internet Opportunities

Given Wednesday, 10 Nov 1999 [View Slides for this Presentation]

Presentation 3
The Main Event--RCP vs. Telefonica

Given Wednesday, 1 Dec 1999 [View Slides for this Presentation]

Overview Handout (318K)
(*Requires Adobe Acrobat Reader*)

Project References

List of References

This page lists the sources used for our research. Print and online sources are listed first, while interviews are listed at the bottom of the page.

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- Bowen, Sally. (August 9, 1991). "Peru Telecoms Market Connection" *Financial Times* (London), p. 3.
- Central Intelligence Agency, "Peru," *CIA World Factbook* (1998).
- Consejo Nacional de Ciencia y Tecnología Perú (CONCYTEC)

  "Estudio de la realidad nacional en ciencia y tecnologia" [Study of the National Reality en Science and Technology]," December 1998.

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- Krochmal, Lisa, "Can the Venture Capital Model Work for Latin America?", LatPro's web site.
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- Montealegre, Ramiro, A temporal model of institutional interventions for information technology adoption in less-developed countries: *Journal of Management Information Systems*; Armonk; Summer 1999 (Peru is one of the case studies)
- OECD, Development Indicators -- Economic Well-being (1999).
- OIT Regional Office for Latin America & The Caribbean, ILO Labor Statistics (1999).
- OIT Regional Office for Latin America & The Caribbean, Estructura del Empleo no Agropecuario 1990-1997 (1999).
- O'Neill, Judith. "Dynamics of Telecommunications Sector Restructuring." *Telecommunications Int'l Edition*, pp. 70-75. (January 1991).
- "Peru" Encyclopædia Britannica Online. <http://www.eb.com:180/bol/topic?eu=115067&sctn=1>.
- Pontificia Universidad Catolica del Peru Web Site:

  Informatics Engineering Department

  Informatics Services Unit
- Red Cientifica Peruana web site:

  Articles from El Comercio (Peruvian Newspaper) See: RCP Press Information. (February 25, 1999 and others).

  Directorio Nacional de Cabinas Públicas (surveyed as of 10 Oct 1999)

  Education Page
- Telefonica del Peru web site:

  http://www.telefonica.com.pe/acerca/memoria/m5.htm

  regarding opening of the market: http://www.telefonica.com.pe/acerca/memoria/m17.htm

  history: http://www.telefonica.com.pe/acerca/memoria/m21.htm

  tariffs:

http://www.telefonica.com.pe/emphogar/tarifas/tarbas.htm

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- La Universidad de Lima Web Site:

  Systems Engineering Department

  Student Services: Infomatics and Systems
- Universidad Nacional Mayor de San Marcos
- Universidad Nacional de Piura:

  Informatics Engineering Department

  Informatics Institute Courses
- Urrelo Guerra, Dr. Rafael, Presentation to the Peruvian Congress on the "Bill for a law to promote investment in technological development, "
- World Bank, *World Development Report*, 1998/99

Interviews

- Personal interviews with Peruvians, October 1999
- Email correspondence with Latin American Venture Capitalist and Entrepreneur from Sandro Trosso
- Conversation with Peruvian Congressman Oswaldo Sandoval Aguirre.
- Conversation with Latin American Venture Capitalist Oswaldo Sandoval Zavala.

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This research project is the work of the **Peru Team** from the course "The Information Revolution in Latin America" offered at Stanford University, Fall Quarter 1999.

The Peru team consists of John Bilderbeck, Debbie Jaffe, Karen Libby, and Christian Sandvig.

A group moment after presentation 3:

From left to right:
Presenter (John)
Red Cientifica Peruana (Karen)
Referee / "The State" (Christian)
Telefonica del Peru (Debbie)

CS 377C - CLAS 194, Fall 1999, Stanford University

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Please send us your comments on this site. You can also view the comments history.

Send us your thoughts and comments.

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Name:

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Feedback History

This page shows the comments that we have received. Please take a moment to send us your comments.

Name: Karen Libby
Organization: Stanford University student, Peru group member
Date: 26 October 1999

The feedback option is now operational!

Name: Isaac Kos-Read
Organization: Stanford University, Department of Economics
Date: 1 November 1999

Your presentation had a coherent arc to it from introducation using basic statistics to the concluding slide. Your focus on the success of the red cientifica was useful as it allowed listeners to take away some detailed example useful for considering in their own cases. I found the slides aesthetically well-designed and the speakers of high quality. If I remember correctly, one of your speakers sounded a little too much like an advertisement. In fact, I recieved a rather rosy picture of the case for Internet in Peru of which I am very skeptical. I think there could possibly be less emphasis on convincing and selling Peru, and rather on a critical look at what is happening versus what could happen given various different policy rubrics.

Web-page:
Given that this medium can be very artistic, I think you could do more of that for your page but at the same time I feel it has a very clean, academic quality to it. Of course, given the prior research of some of your memebers, it looks as though you were able to focus rather efficiently on other aspects of the Peruvian case. The information is very complete and supplemented by lots of statistics and links to the sites of origin of all the information - a great resource has been created!

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Index by Topic

Other views: [Overview | Presentations | Index | Charts]

This page lists the results of our research, ordered alphabetically by topic, then by subtopic. The presentation number where the topic was covered is indicated in brackets after each entry.

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Charts

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This page lists the charts and tables on this Web site and in our slide shows, alphabetically by title. The presentation number where the topic was covered is indicated in brackets after each entry.

- Expansion and Modernization Program of Telefonica, 1994-1998 [2]
- Internet Connection Fees Advertised by RCP, 1999 [1]
- Labor Market Breakdown *(from Power Point slides)* [1]
- Peru Snapshot in Statistics *(from Power Point slides)* [1]
- Peruvian Users of Teleservices by Type of Service, 1996 [1]
- Public Cabin in Rural Area (photograph) *(from Power Point slides)* [3]
- Software Piracy, 1995-1997 *(from Power Point slides)* [2]
- Sources of Financing, Conceptual Overview *(from Power Point slides)* [2]
- Survey of Banks Providing Lines of Credit and Loans, 1999 [2]
- Telecom Infrastructure Indicators, 1993-1996 [1]
- Telephone Penetration, 1993-1996 *(from Power Point slides)* [1]
- Telephone Service Tariffs (Telefonica), 1999 [2]
- Wait For Telephone Line In Months, 1993-1996 *(from Power Point slides)* [1]

Research and Analysis by Topic

Banks

(This topic was originally discussed in Presentation 2)

Bank loans and lines of credit are available in Peru, but like in the United States, they are a costly source of financing. For small businesses, loans are only given with personal collateral of one of the borrowers. Even for large businesses, the interest rates (taken from the Banco de Comercio) can be prohibitive, ranging from 20-60% depending on the type of loan and whether it is in nuevo soles or US dollars. At the extreme end, an overdraft interest in soles carried an interest rate of 166.17% compared to 28% if denominated in dollars. This shows the inherent risk perceived of a currency devaluation in Peru. For small businesses without access to a foreign currency, these high rates make bank loans very unattractive.

Other major banks surveyed provided services for businesses including lines of credit and loans, but at similar rates. These banks included:

- Banco de Credito: financing options fit most short term capital needs, with special products for the agriculture sector. The also offered some medium and long term longs, and loans for construction.
- Banco Latino:
- Banco Republica
- Banco Santander: a Spanish bank
- Banco Wiese: offers a variety of options for small and large businesses. Wiese interest rates were lower than Banco de Comercio.

See Also

The next topic in this presentation: Financing: Government Assistance

Sources

- Email correspondence with Latin American Venture Capitalist and Entrepreneur from Sandro Trosso

- Conversation with Peruvian Congressman Oswaldo Sandoval Aguirre.
- Conversation with Latin American Venture Capitalist Oswaldo Sandoval Zavala.
- Proyecto De Ley Promocion de la Inversion en Desarrollo Technologico (Law Project for the Promotion of Investment in Technical Development)
- IADB story on Internet for the People
- Endeavor Initiative
- LatPro's "Can the Venture Capital Model Work for Latin America?"
- World Bank
- Inter-American Development Bank
- Red Cientifica Peruana
- Banco de Comercio interest rate table
- The Industry Standard company description of FirstCom Corporation
- Quicken.com/Excite page on FirstCom
- Montealegre, Ramiro, "A temporal model of institutional interventions for information technology adoption in less-developed countries", Journal of Management Information Systems.

Research and Analysis by Topic

Government Assistance

(This topic was originally discussed in Presentation 2)

There are several possible mechanisms for the state to provide (or assist in providing) financing for Internet ventures.

Direct financing from the state transfers resources from the State through specialized institutions or a technological development fund to those companies interested in employing a new technology, or which claim to generate or adapt technology in their own labs or contract their development with special R&D entities. The resources can be transferred as nonrefundable funds through contests or as loans with or without elements of subsidy. In general, subsidies on part of the cost of a project are justified when there are externalities, large risks, and long term maturation of the R&D.

Tax Benefits and Subsidies would allow the reduction of income by investments that businesses have in R&D, for the purpose of tax payment. Tax incentives and benefits and subsidies for certain industries are very controversial in the Peruvian Congress. Prior to the free market reforms of the Fujimori government, tax breaks and subsidies were used to favor certain industries over others. Often these tools were used to give favors to particular interest groups. Under the new Constitution of 1993, Congressmen are reluctant to support any law that would provide "market distorting" incentives to particular sectors of the economy, such as tax incentives and subsidies. According to one Congressman, the current government is unlikely to pass any law that provides such tax incentives.

Such distaste for tax benefits is evident from the failure of the Law Project to Promote Technological Development to pass into law in September of 1999. This bill (Law Project 5054 discussed below) proposed tax benefits for projects related to technology R&D and the use of new technologies. This bill and other similar laws are discussed below.

Law Project 5054 - text of law (Spanish) - partial English translation

In 1999 a new law was proposed under the Law Project for the Promotion of Investment in Technical Development by the

Congressional Commission on Science and Technology. While the law passed the approval of the Science and Technology Commission, it was rejected outright by the Economic Commission in September 1999 as mentioned above.

The proposed law contained items relevant to financing of technology projects, and would most likely apply to Internet-related projects. The proposed law included tax benefits and credits relevant R&D investments or adoption of new technologies (up to 20% of net income).

Law Project 3261 - text of the law (Spanish) - Despite the failure of Law Project 5054, a previous project begun in April 1997 for a law proposing a framework for the promotion of science and technology was realized on 8/4/99.

Details related to financing include Article 7, which states that the State promotes and guarantees private, national, or foreign investment that contributes to the development of science and technology and the innovation and transfer of technology. This would likely apply to Internet-related technologies, and could possibly relate to the government guarantee on the RCP loan mentioned in Venture Capital and Multinational Organizations sections.

Details related to intellectual property: Article 29 states that the State protects innovation in all fields of technology through the authorization of industrial property titles in concordance with the legal devices in force and with international treaties signed by Peru.

See Also

The next topic in this presentation: Financing: Going Public

Sources

- Email correspondence with Latin American Venture Capitalist and Entrepreneur from Sandro Trosso
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Research and Analysis by Topic

Technical Capacity

(This topic was originally discussed in Presentation 1)

Since the early 1990s, the technological capacity of Peru (especially that specific to telecommunications) has risen dramatically. Peru's Physical telephone network has been invigorated, with a dramatic increase in telephone penetration from 2.9% in 1993 to 5.9% in 1996 and a dramatic decrease in the wait for a telephone line (see graph).

Such vitalization in the telephone system is largely due to governmental policy such as the privatization of the formerly state-run ENTEL. Now functioning as Telefonica del Peru (TDP), the company has invested heavily in infrastructure, resulting in high growth of the sector.

In terms of Internet-specific capacity, Peru was identified as one of Latin America's (and the world's) fastest growing markets. The rate of ownership of Personal computers has seen an approximate 377% growth rate. The number of Internet hosts has grown over 204% in the last 12 months. Such advancements have given Peru the status of an Internet Growth Leader.

The top Internet Service Provider in Peru is Red Científica Peruana, or RCP (see: http://ekeko.rcp.net.pe/rcp/rcp_net.htm). It is a user-owned cooperative that pioneered the concept of cabinas públicas -- franchised computer centers typically run by individual investors, chambers of commerce, or banks that provide Internet access through RCP for about US$1 per hour.

It is interesting to note that according to our statistics, actual telephone system modernization is rapidly outpacing predictions. The following tables summarize the state of the technical capacity of Peru.

Peruvian Users by Type of Service

Peruvian Users of Teleservices Nationally, 1996

Type of Service	# users
Telephone	1,260,000
Cellular	152,000
Cable TV	100,000
Internet Access	40,000

Source: Peru en Numeros, 1997

Telecommunications Infrastructure

Indicators from Telefonica Del Peru, 1993-1996

	1993	1994	1995	1996
Installed capacity of fixed lines	753,987	870,669	1,309,908	1,764,809
Total lines in service	673,021	772,390	1,109,231	1,435,147
Lines in service per 100 people	2.9	3.4	4.7	5.9
Avg # of months of waiting list for a line	70	33	5	2

Source: Peru en Numeros, 1997

Personal Computer Penetration

Personal Computer Penetration in Peru, 1996-1999

	1996	1999
PCs per 1000 inhabitants	5.9	27.9

1996 Data Source: World Bank World Development Report 1998/99
1999 Data Source: The Global Competitiveness Report 1999

Internet Connection Fees

The following fees were advertised by RCP (as of 10 Oct 1999).

Tarifas RCP-Internet Perú

CUOTAS MENSUALES

CONEXIONES DIAL UP			**LINEAS DEDICADAS (Digired)**				
UUCP	Interactivo	UUCP + SLIP	9.6 Kbps	19.2 Kbps	64 Kbps	128 Kbps	256 Kbps

Tarifa Base	$20.99	$21.99	$48.00	$330	$390	$600	$980	$1300
Institucional o Individual	$18.99	$18.99	$43.00	$300	$360	$550	$900	$1200
Cabinas Pública	$15.00							

See Also

The next topic in this presentation: Access to Internet Opportunity

Sources

- Source: Holligan, Jane (October 25, 1999). *Business Week*. "Peru: Putting the Net in the corner store."
- Directorio Nacional de Cabinas Públicas (surveyed as of 10 Oct 1999)
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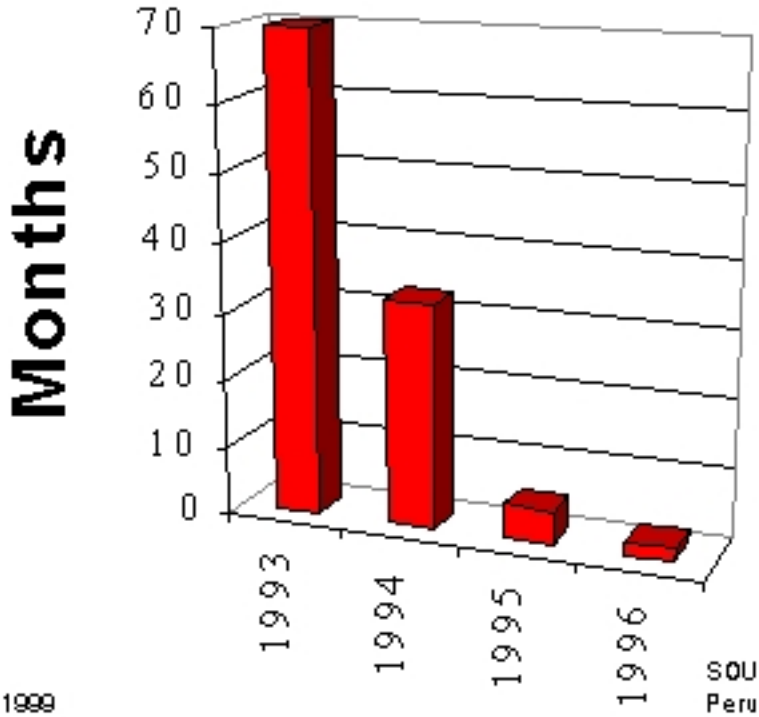
- Telefonica del Peru -- Variables Significativas
- Telefonica del Peru -- Regulacion y Apertura del Mercado
- Organismo Supervisor de Inversion Privada en Telecomunicaciones (OSIPTEL)
- "Telecom Boom" (October 1997). *Latin Trade*, 5 (10), pg. 48.

Wait For Telephone Line

In Months, 1993-1996



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SOURCES:
Peru en Numeros, 1997

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Research and Analysis by Topic

Telecommunications Policy Overview

(This topic was originally discussed in Presentation 2)

Peru has seen a rebirth in the telecommunications industry and a dramatic improvement in infrastructure in the past decade. Much of this can be attributed to recent change in telecommunications policies and movement by the major telecom players in the region. A 1991 Telecommunications Reform Act phased out ENTEL Peru, the former telecom conglomerate, to allow foreign investment, provide for the transition to a more liberalized market, and establish a new regulation process for the industry. Telefonica del Peru (http://www.telefonica.com.pe/) was bought by Telefonica del Espana, or TISA, (http://www.telefonica.es/) in 1994, thus prompting a five-year exclusivity period for TISA -- a controversial policy of legalized monopoly.

During this period, Telefonica blanketed Peru with an advertising campaign featuring a piano tuner tuning a grand piano, with the message "It sounds worse before it sounds better." As can be inferred, policy changes showed mixed results. A large number of complaints were registered with the new government regulator, and some challenged that the spectacular growth was not as large as many thought would have been possible without the monopoly.

Today, the telecommunications market is entirely privatized and the Peruvian government has mandated interconnection.

See Also

The next topic in this presentation: Intellectual Property Overview

Sources

- "Telecom Boom" (October 1997). *Latin Trade*, 5 (10), pg. 48.
- Mayo, John K.; Heald, Gary R.; Klees, Steven J. "Commercial Satellite Telecommunications and National Development: Lessons From Peru." *Telecommunications Policy*, 16(1). pp. 67-80. (1992).
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- Bowen, Sally. (August 9, 1991). "Peru Telecoms Market Connection" *Financial Times* (London), p. 3.

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Research and Analysis by Topic

Telecommunications Privatization (1994)

(This topic was originally discussed in Presentation 3)

In 1994, the intent of telecommunications reform legislation is realized and the telephone industry is privatized in Peru. Parts of ENTEL (the formerly state-owned monopoly) and CPTSA become controlled by the Telefonica Peru Holding. In February, a majority share in Telefonica is sold at auction to Telefonica de Espana (TISA) for $1.6 billion. The purchase provides a source of much-needed foreign capital to expand and modernize (and the purcase price provides the state much-needed revenue). While privatization was achieved in 1994, market liberalization was not: TISA is given a five year exclusivity period (monopoly) in many markets to protect its investment. A schedule is established to phase out the remaining (minority share) state ownership of Telefonica over the next five years by selling these shares to private investors. While the purchase price for Telefonica del Peru was thought by some to be an overvaluation of the existing system, others complained that the grant of a five-year legal monopoly TISA was a corporate giveaway that would ultimately hurt consumers.

See Also

The next topic in this presentation: RCP's Beginnings (1991-1994)

Sources

- Telefonica del Peru -- Variables Significativas
- Telefonica del Peru -- Regulacion y Apertura del Mercado
- Organismo Supervisor de Inversion Privada en Telecomunicaciones (OSIPTEL)
- "Telecom Boom" (October 1997). *Latin Trade*, 5 (10), pg. 48.

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Research and Analysis by Topic

Telefonica's Infrastructure Investment (1995-1999)

(This topic was originally discussed in Presentation 3)

In 1995 the now-private telecommunications monopoly officially changes its name to Telefonica del Peru, SA and embarks on a massive program of investment that would total US$1.5 billion dollars -- US$1.1 billion of this has been for basic telephony. The average wait time for a telephone line to be installed plummets from 35 months in 1994 (77 in 1995) to 5 months in 1995, then to 2 months by 1996 (see graph).

After two years of development, network digitization stood at 77%. Telefonica goes pubic in July of 1996 by issuing ADRs through the NYSE (symbol: TDP) in the United States. The offering, valued at $1.1 billion, was the largest equity sale in a Latin American stock since the Mexican peso crisis and resultant "tequila hangover." Analysts say that it's success was a benchmark of returning confidence in the region. Also in 1996, the State's shares of Telefonica are offered publicly in Peru.

By 1997 Spanish parent company TISA planned on spending $600 million in Telefonica development. Telefonica has developed double the phone line penetration in Peru than since it was privatized (6.7% in compared to 3.4% in 1994), a remarkable improvement.

Expansion and Modernization Program of Telefonica, 1994-1998

	1994		1995		1996		1997	1998
	planned	real	planned	real	planned	real	planned	planned
Installation of additional lines	104,000	116,682	140,000	439,239	216,000	445,714	259,300	259,300
Substitution of installed lines	20,000	63,486	30,000	111,781	50,000	45,096	50,000	50,000

Source: Peru en Numeros, 1997

See Also

The next topic in this presentation: Telefonica: Ending the Monopoly (1997-1999)

Sources

- Government of Peru, *Peru en Numeros* (1997).
- Telefonica del Peru -- Variables Significativas
- Telefonica del Peru -- Regulacion y Apertura del Mercado
- Organismo Supervisor de Inversion Privada en Telecomunicaciones (OSIPTEL)
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Research and Analysis by Topic

Access to Internet Opportunity

(This topic was originally discussed in Presentation 1)

While many of the aspects described in other sections reveal a promising picture for Peru, it must be remembered that despite such promise, MANY of Peru's citizens are and will continue to be excluded from Peru's Internet revolution. Among these are the poor in urban and rural areas, the uneducated and illiterate, and the isolated people outside of large urban centers. It is highly likely that many people fall under more than one of these descriptions. The poor cannot afford education, even at the most primary levels. Other families in the middle class may still be unable to afford higher education.

A useful framework for considering how people may be excluded could be through the lenses of Dispersion, Content, and Poverty. As mentioned in the geography section, populations dispersed outside of urban areas may not have the communication lines to make the leap to Internet technology. In terms of content, the web is still primarily an English language medium-while Peruvian content is growing in leaps and bounds, for many Peruvians even that content may not be relevant to their lives. In addition, the large indigenous population of Peru may not access the web because of a language difference (speaking Quechua and not Spanish).

However, the most glaring obstacles to opportunity and access are economic. 54% of Peru's population lives below the poverty line, and national consumption of products is heavily biased toward the highest 10% income earners. Even Peruvians who aren't destitute would still encounter difficulties in getting on-line, as evidenced from a simple comparison of wages and the costs of equipment and training (see table).

On a positive note, Peru seems to be doing well given this situation. RCP has proven to be a true believer in Universal Access through the innovative "Cabinas Publicas" (low cost public Internet cabins) project and through other initiatives to provide Peruvian content and education. Such action enables NGOs and advocacy groups to put up sites on the web to benefit various sectors of the Peruvian population. In this sense, Peru (and RCP in particular) are doing the best with what they have to increase

opportunity and access to the Internet throughout the country.

See Also

The next topic in this presentation: Introducing Red Cientifica Peruana

Sources

- OECD, Development Indicators -- Economic Well-being (1999).
- U.S. Central Intelligence Agency, "Peru," *CIA World Factbook* (1999).

Labor

A “receptive” population?

- Cost of Labor: $2.04/hr. (Mfg. Sector)
- Labor Distribution:

Agriculture:	5.9%
Industry	21.6%
Services	72.4%

- Services Breakdown:

Commerce: 33.3%	Transportation: 9.2%
Finance: 8.8%	Other: 25.3%

SOURCES:
www.odci.gov/cia/publications/factbook/pe.html
www.oit.org.pe/spanish/260ameri/info/estadis/estadis.shtm

Peru Snapshot

- Population 26.6 million
- Land area 496,225 sq. mi.
- Languages: Spanish; Quechua; Aymara
- Urban 71.2%; Rural 28.8%
- Age Structure:

0-14	35%
15-64	60%
65+	5%

- GDP per capita (1998): US$ 2,209

SOURCES:
http://www.odci.gov/cia/publications/factbook/pe.html
www.iadb.org/oce/IPES98_ENG/Appen_Eng.pdf

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Labor

- Total Labor Force: 32.6% of population
- Unemployment: 7.7%
- Informal: 40% Formal: 40.7%
  "Small Business": 19.4%
- Underemployment difficult to measure
- Agriculture is a relatively small sector (7% of GDP)

SOURCES:
www.ilo.org/public/english/80relpro/publ/wlr/97/annex/index.htm
www.odci.gov/cia/publications/factbook/pe.html
www.oit.org.pe/spanish/260ameri/info/estadis/estadis.shtml

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Education: Long Term

Investment is the key to success

- High Literacy Rate (89%)
  - Employees can be trained at Institutes
- High Primary Enrollment (122%)
  - Only in theory: actually closer to 59%
  - Key to long-term technology learning
- Public Expenditure on Education
  - Not high enough (<3% of GDP)

SOURCES:

http://www.odci.gov/cia/publications/factbook/pe.html
UNESCO Statistical Yearbook
Janet Matthews Information Services Quest Economics Database
Countrywise Publishing Ltd, Country Market Report, 1998

Conclusions

- Still a ways to go
  - Education, Dispersion, Poverty
- "Decent Seeds, good watering"
- RCP enables a real potential success story

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Education, Labor Markets and Technical Capacity

October 25, 1999

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Conclusions

Labor A “receptive” population?

- **Cost of Labor: $2.04/hr. (Mfg. Sector)**
- **Labor Distribution:**

  Agriculture: 5.9% Industry 21.6% Services 72.4%

  - Services Breakdown:
    Commerce: 33.3% Transportation: 9.2% Finance: 8.8% Other: 25.3%

SOURCES: www.odci.gov/cia/publications/factbook/pe.html
www.oit.org.pe/spanish/260ameri/info/estadis/estadis.shtml

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Peru Snapshot

- **Population 26.6 million**
- **Land area 496,225 sq. mi.**
- **Languages: Spanish; Quechua; Aymara**
- **Urban 71.2%; Rural 28.8%**
- **Age Structure: 0-14 35% 15-64 60% 65+ 5%**
- **GDP per capita (1998): US$ 2,209**

SOURCES: http://www.odci.gov/cia/publications/factbook/pe.html
www.iadb.org/oce/IPES98_ENG/Appen_Eng.pdf

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SOURCE: Holligan, Jane. "Peru: Putting the Net in the Corner Store." *BusinessWeek* (int'l ed.) October 25, 1999.

Telefonica vs. RCP:
The Main Event

Conclusions

Who is outside the ring?

- Is there enough Peruvian content?
- A promising and uplifting picture--*for whom*?
  - Main obstacle on user end is economic
    - $15 a month is affordable, but not for everyone
    - Money affects more than access
  - Does "the dream" match reality?

20

The Main Event

RCP vs. Telefonica

December 1, 1999

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PPT Slide

SOURCE: Holligan, Jane. “Peru: Putting the Net in the Corner Store.” BusinessWeek (int’l ed.) October 25, 1999.

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Software Piracy

Still a major problem

- Piracy decreasing

	1995	1996	1997
Piracy rates	**84%**	**74%**	**66%**
Piracy losses	**$40,522**	**$32,437**	**$31,017**

- …but still a major source of lost revenue
  - 75% of businesses use illegal software
  - 6 out of 10 applications in L.A. pirated
- On "Watch List" for having serious intellectual property rights deficiencies

Creating Internet Opportunities:

Public and Private Initiatives

Intellectual Property Policy

Steps toward protection

- Member of multilateral IP conventions
  - Berne Treaty (1963)
  - Universal Copyright Convention (1963)
- Facilitating Agency: INDECOPI
- Computer programs not explicitly recognized as literary works
- Sanctions: few legal recourses

Sources of Financing

Good precedents pave the way

Company Size	Source of Funding: Peru	Source of Funding: Foreign
Small	$	☹
Medium & Large	$	$ $ $

Conclusions:

Obstacles outnumber opportunities

- Telecom sector growing, contested
- Intellectual property enforcement lacking
- Internet not on policy agenda
- Poverty, health, and education projects have attention of multinat'l aid agencies
- Internet entrepreneurship must precede venture funding

Creating Internet Opportunities

Public and Private Initiatives

November 10, 1999

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Software Piracy Still a major problem

- ## Piracy decreasing

  1995
  1996
  1997
  Piracy rates
  84%
  74%
  66%
  Piracy losses
  $40,522
  $32,437
  $31,017

- …but still a major source of lost revenue
  - 75% of businesses use illegal software
  - 6 out of 10 applications in L.A. pirated
- On “Watch List” for having serious intellectual property rights deficiencies

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Sources of Financing

Medium & Large Companies: Internal

- Bank Loans/Credit (short term)
  - High interest rates (15%-167%!)
- Government role
  - Guarantee loans: ex. RCP and WorldTel
- Going Public "Bolsa de Valores"
  - Telefonica (TDP)
- Vendor Financing (short term)
- Retained Earnings

Sources of Financing Good precedents pave the way

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Technical Capacity

Physical Network Invigorated

- Revitalized Telephone System
  - Privatization, Liberalization, & Expansion
- Telephone Penetration (lines/100)

1993	1994	1995	1996
2.9	3.4	4.7	5.9

- Installed Capacity: 1.7 million lines
- Slower CATV, cellular deployment

SOURCES:
Peru en Numeros, 1997

Education: Short Term

Good higher level training / education

- Universities: 59% offer CS degrees
  - Similar to US curricula
  - Adequate resources (58 students/computer)
- Vocational Schools
  - Several in Lima offer courses in computing
- Public Training: RCP takes the lead
  - Affordable Internet and computer classes

SOURCES:
Peru en Numeros, 1997
http://andromeda.pucp.edu.pe

Technical Capacity Physical Network Invigorated

- **Revitalized Telephone System**
  - Privatization, Liberalization, & Expansion
- **Telephone Penetration (lines/100)**
- **Installed Capacity: 1.7 million lines**
- **Slower CATV, cellular deployment**

SOURCES: Peru en Numeros, 1997

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Technical Capacity

Internet: Remarkable Growth

- Personal Computers per 1,000
  - 1996: 5.9 1997: 12.3 1999: 27.9 (est.)
- 10-12 Nat'l Internet Service Providers
- An Internet Growth Leader
  - 3.2 Internet hosts per 10,000 (7,805)
  - +204% over last 12 months
- Dominant ISP: Red Científica Peruana
  - User-owned cooperative
  - **Cabinas Públicas** & Franchising

SOURCES:
World Bank Development Report, 98/99
Global Competitiveness Report, 1999
http://thelist.internet.com, http://www.isc.com

Wait For Telephone Line In Months, 1993-1996

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SOURCES: Peru en Numeros, 1997

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The Information Revolution in Latin America: The Case of Peru

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Research and Analysis by Topic

Geography and Demography

(This topic was originally discussed in Presentation 1)

Looking at a map of Peru, one immediately notices the great variety of terrain, resulting in widely scattered cities across an often impassable landscape. Two of the most salient geographic characteristics are the enormous percentage of mountainous terrain on one side of the country and the vast expanse of dense rainforest on the other side.

Impassable terrain directly affects the teledensity of a region, as high geographic obstacles (such as mountains of jungle) result in high installation costs of telephone lines. Communities that find themselves in peripheral inaccessible areas of the country are therefore double-isolated, through geography and lack of communications. Despite the great strides that have occurred in Peru's telecommunications landscape, geography continues to be one major obstacle to wide-spread and complete Internet growth in Peru.

In addition, the geographic make-up of a country directly influences the type of labor its population engages in. In Peru's case, such a high variety of terrain results in a low percentage of arable land. Peru therefore has a very low percentage of its population engaged in agriculture (7% of GDP) and is thus highly dependent on food imports.

In addition, Peru is a highly centralized nation, with 71.2% of the population living in Urban areas. This is one factor mitigating and exacerbating the difficulty in reaching the outer regions of the country. With so much of the population in cities (63.3% of total population in Lima), much of the population can be wired or at least have access to an area with telephones. At the same time, there is not much incentive for the powers that be (government, telephone company) to consider the minority population who is not wired, since wiring such a minority stake across an impassable geography is costly and inefficient. On one hand, Peru's geography is an advantage to city dwellers who have access to a centralized area of decent telecommunications activity. On the other hand, those in non-urban isolated areas are excluded.

See Also

The next topic in this presentation: Labor Market

Sources

- "Peru." Encyclopædia Britannica Online.
- Government of Peru, *Peru en Numeros* (1997).
- U.S. Central Intelligence Agency, "Peru," *CIA World Factbook* (1999).

Research and Analysis by Topic

Labor Market

(This topic was originally discussed in Presentation 1)

Peru's labor market is highly shaped by the nation's geography. Much of Peru's land is not arable, due to extreme terrain such as mountains or rain-forests. Corresponding to the low percentage of arable land, a low percentage of Peru's population is engaged in agriculture (7% of GDP). However, in terms of the Internet, our group considers this factor to be a relative advantage-a low population in agriculture could signify a population that is engaged in more service or commerce, sectors which have benefited greatly from the Internet in the developed world.

This is indeed the case-Peru has a higher percentage of its population engaged in Industry (21.6%) and Services (72.4%) than most of its Latin American neighbors. At the same time, these sectors are quite difficult to define. Roaming small market vendors or providers of other services (i.e. shoe-shining or lamination) can fall under the service sector yet still have no great labor benefit from the Internet. Considering the imbalance between workers in formal and informal labor (Informal + "Small Business" = 59.3%, Formal = 40.7%) and the difficulty in measuring underemployment, it is likely that many Peruvians face the same situation. In addition, it is highly unlikely that any of the 7.7% of the population that is unemployed would be able to access the Internet.

Beyond the labor sectors that the population works in, it is important to determine what kind of specific labor is being undertaken-a large population in "Services" says nothing about how many of those workers are manual transportation laborers or how many are involved in information services. With the average cost of labor at $2.04/hr. (from the manufacturing sector), it is likely that many within Services and Industry are engaged in low-value-added work, rendering the Internet not as relevant to their lives.

Beyond these obstacles, however, Peru's labor market still demonstrates a "decent seed" that could be taken advantage of further in terms of diffusion of the Internet.

See Also

The next topic in this presentation: Education: Long-term outlook

Sources

- OIT Regional Office for Latin America & The Caribbean, ILO Labor Statistics (1999).
- OIT Regional Office for Latin America & The Caribbean, Estructura del Empleo no Agropecuario 1990-1997 (1999).
- Government of Peru, *Peru en Numeros* (1997).
- U.S. Central Intelligence Agency, "Peru," *CIA World Factbook* (1999).

Opportunity

Wages & Costs

- Average Monthly Wage, in US dollars

	Empleados	*Obreros*
Inside Lima	$622.00	$283.00
Outside Lima	$437.00	$215.00

- Cost of a Computer = $1,000-$2,000
- Cost of Training = $15-75/month
- Cost of Access = $15-~$30/month

SOURCES:
Peru en Numeros, 1997
Personal interview with Ricardo Wilson
ekeko.rcp.net.pe/educacion/regulares.htm

Opportunity

Many Still Excluded

- Dispersion
  - Teledensity outside of Greater Lima
- Content
  - Local Content & language concerns
- Poverty
  - 54% of Population below poverty line
  - Poorest 20% = 4.9% Consumption, Highest 10% = 34.3%

SOURCES:
World Bank Development Report, 1998
http://www.odci.gov/cia/publications/factbook/pe.html

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Opportunity

Doing Well With the Situation

- RCP Truly Believes in Universal Access
  - Cabinas Publicas for $15/month, shared cooperative profits
  - 110 Cabinas in Lima, 60 dispersed, with more on the way
  - Providing local content, service, and hosting

SOURCES:
http://cabinas.rcp.net.pe/
http://www.iadb.org/exr/IDB/stories/1997/eng/e1112.htm

Opportunity Wages & Costs

- **Average Monthly Wage, in US dollars**
- **Cost of a Computer = $1,000-$2,000**
- **Cost of Training = $15-75/month**
- **Cost of Access = $15-~$30/month**

SOURCES: Peru en Numeros, 1997 Personal interview with Ricardo Wilson
ekeko.rcp.net.pe/educacion/regulares.htm

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Research and Analysis by Topic

Introducing Red Cientifica Peruana

(This topic was originally discussed in Presentation 1)

Formed in 1991 as a national network of universities and research facilities, La Red Cientifica Peruana, or RCP has since grown to be the major mover and shaker in the Peruvian Internet scene. In the development of the organization, RCP's goal has remained simple and sincere: To provide Peru with the tools to adequately and fairly use the Internet to the country's advantage. This vision has led RCP to undertake several different initiatives that have greatly bolstered Peru's Internet presence internally and internationally.

To begin with, it could be fairly said that RCP was primarily responsible for the increase in Internet users-through community education, informative chats, conferences, and provincial outreach programs, the non-profit organization convinced many Peruvians of the importance of the Internet-in this sense, RCP "grew" its own market of Internet users. Today it continues to do so, providing education and training to its ISP subscribers and maintaining the tradition of free informative chats to the public from their office in Lima.

RCP has taken this vision of education and Internet provision much further than Lima, however. With its star project, "Cabinas Publicas," RCP envisioned and created a new model for internet provision, matching the realities of most Peruvians, who have neither a telephone line nor a Personal Computer. Affordable public Internet cabins address these realities, and they have already sparked national growth in Internet use, contributing to the more than 400,000 final internet users in Peru.

Finally, RCP undertakes a number of smaller projects as well, including Proyecto Ciudadano, a RCP sponsored web-site that provides information to people outside of Lima about civic rights and social services. In this sense, RCP stands by its ideal of the Internet for Democratization.

See Also

The beginning of the next presentation: Summary of Presentation 2

Sources

- Personal interviews with Peruvians, October 1999
- Articles from El Comercio (Peruvian Newspaper) See: RCP Press Information. (February 25, 1999 and others).

Research and Analysis by Topic

Summary of Presentation 2

(This topic was originally discussed in Presentation 2)

In order to foster Internet development and growth, certain institutions need to be in place. Specifically, the telecommunications sector, intellectual property protection, and the availability of financing support the growth of Internet ventures.

- Telecommunications serves as a basis for the Internet by providing many of the lines and infrastructure due to telephone expansion. Many telecom companies that previously dealt with telephone, cable, and wireless are creating Internet divisions to compete in the Internet service provision market or leasing their lines to other service providers to do the same. In Peru, recent changes in telecommunications policy, such as the buyout of Telefonica del Peru and the ensuing monopoly by its buyer, Telefonica del Espana, have affected consumer satisfaction and line control.
- Intellectual property rights must also be in place before many Internet ventures can take place, especially in the case of e-commerce and online businesses. Peru has taken strides toward preserving intellectual property, but many laws are unenforced. In order to secure entrepreneur's trust, the government must step up its intellectual property protections.
- Finally, financing options must be in place for a company to explore Internet options. Developing a business, establishing a web presence, or increasing Internet access is a costly venture and unlikely to succeed with only private funds. Most companies are forced to look outside of Peru for monetary support because of the lack of a venture capital model like the U.S. and the government's reluctance to back technology enterprises.

See Also

The next topic in this presentation: Telecommunications Policy Overview

Sources

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Research and Analysis by Topic

Cabinas Publicas

(This topic was originally discussed in Presentation 3)

RCP has been a pioneer of an alternative model for access to the Internet: Cabinas Publicas (Public Cabins). Rather than assume everyone has telephone, RCP brings access to those without hardware. Cabinas Publicas are available for a low monthly subscription fee. They may be as small as one computer, or contain a lab of many computers. They typically function as a site for training and outreach as well as access. Cabinas Publicas are available throughout the country. 200 cabins currently exist under the direct responsibility of RCP, while even more private franchises bring the total number of cabinas to 600. Cabinas Publicas, when operated as a franchise, have typically been profitable. This model of providing access has been emulated by several other Latin American countries -- Uruguay, Columbia, Togo, Mauritania have asked RCP for assistance.

See Also

A picture of a single-computer cabin (called a "monocabin") in a rural area

The next topic in this presentation: Telefonica: Infrastructure Investment (1995-1999)

Sources

- Red Cientifica Peruana (RCP)
- Red Cientifica Peruana, "Cabinas Publicas RCP: Modelo de acceso universal"
- Holligan, Jane. "Peru: Putting the Net in the Corner Store." BusinessWeek [int'l ed.] (October 25, 1999).

Embedded Secure Document

The file *http://www.stanford.edu/~csandvig/cs377c/Peru_Final_Handout.pdf* is a secure document that has been embedded in this document. Double click the pushpin to view Peru_Final_Handout.pdf.

Research and Analysis by Topic

Overall Conclusions

(This topic was originally discussed in Presentation 3)

In Peru, a non-profit organization (RCP) dedicated to scientific and educational development was essential in developing an "Internet culture," and is now the largest Internet service provider.

At the same time, massive private foreign investment (by Telefonica) in infrastructure was required to improve the telecommunications network to the point where Internet service was possible for more than a few, we call this the "necessary giant". This investment was stimulated by government action: the grant of a five-year monopoly period to the buyer of the formerly state-run telecom monopoly to help guarantee a return.

An innovative non-profit program called cabinas publicas (public cabins) has made a form of universal access possible-over 600 sites offer public Internet access. Cabinas are organized on a franchise basis, and are profitable. This is being used as a model by other Latin American countries.

While the Internet is expanding in Peru, the nation's economic inequality makes the prime barrier to a wide scale Internet revolution an economic one. As it stands, the benefits of any development are likely to benefit those that are already of means.

See Also

The handout for this presentation: Overview Handout (318K) (*Requires Adobe Acrobat Reader*)

Sources

- Bourrie, Sally Ruth, "Peru awaits PCS Entrants," *Wireless Week*, June 28, 1998.
- Telefonica del Peru -- Tarifas Servicios Telefonicos Basicos
- Telefonica del Peru -- Variables Significativas

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Research and Analysis by Topic

A History of Conflict

(This topic was originally discussed in Presentation 3)

RCP and Telefonica present the unusual case of a for-profit and a non-profit organization in direct competition in the ISP market. In addition, RCP is a customer in competition with its most important supplier, Telefonica. RCP must telefonica's lines to provide Internet service. In the ISP market, RCP is in the lead with a market share of 56%, while Telefónica and IBM about evenly split the next 44%.

At one time the RCP home page featured a working clock counting down the days until telefonica's legally-sanctioned exclusivity period (monopoly) in some markets was due to expire. RCP has repeatedly accused telefonica of unfair practices, including stalling line installation to RCP clients, cutting lines to discredit RCP, preventing the use of Aplio (an Internet telephony product), and unfair use of lobbying power with the Peruvian government.

See Also

The next topic in this presentation: Overall Conclusions

Sources

- Diario de la Republica, Revista Domingo, (Dec 8, 1996).
- Red Cientifica Peruana (RCP)
- Holligan, Jane. "Peru: Putting the Net in the Corner Store." BusinessWeek [int'l ed.] (October 25, 1999).
- "Telecom Boom" (October 1997). *Latin Trade*, 5 (10), pg. 48.

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Research and Analysis by Topic

Ending the Monopoly (1997-1999)

(This topic was originally discussed in Presentation 3)

While a state-sanctioned monopoly in some markets, it is important to note that Telefonica is not protected by a legal monopoly in the market for Internet Service Provision, or in the Lima wireless market. In 1997, BellSouth moves into the Lima wireless market by acquiring 58.8% of Tele2000 -- creating stiff competition for Telefonica. The initial growth of the Internet seems to have caught Telefonica unaware, allowing RCP to acquire a significant lead and a majority market share that persists today.

In July of 1997, The courts rule that Telefonica must provide access to its national cellular network outside of Lima for competitors. This is the first step in a series of interconnection mandates that would be encouraged by OSIPTEL and upheld by the courts.

In 1998, Telefonica's national exclusivity on cellular outside of Lima ended when Tele2000 won the B Band license. In the third quarter of that year Telefonica's market share fell from 76% to 66%, and TDP's profit margins would drop about 8 percent in the year as a whole. While this was a sign of the economic recession caused by el Nino and the emerging financial market crisis, competition surely played a role.

On August 1, 1998, the government announced the opening of local, national and international long-distance markets this year, eliminating, by mutual agreement (in exchange for price concessions), TDP's original monopoly. The monopoly was set to expire June 27, 1999 -- this makes the openeing of the market almost one year ahead of schedule. The government was willing to grant Telefonica significant concessions because Telefonica had satisfactorily completed its program of network expansion and investment, as promised. By the end of 1998, Peruvian telephone network digitization reaches 90%.

See Also

The next topic in this presentation: Telefonica: Future outlook

Sources

- Bourrie, Sally Ruth, "Peru awaits PCS Entrants," *Wireless Week*, June 28, 1998.
- Telefonica del Peru -- Tarifas Servicios Telefonicos Basicos
- Telefonica del Peru -- Variables Significativas
- Telefonica del Peru -- Regulacion y Apertura del Mercado
- Organismo Supervisor de Inversion Privada en Telecomunicaciones (OSIPTEL)

Research and Analysis by Topic

Future outlook for Telefonica

(This topic was originally discussed in Presentation 3)

As of this year (1999) the markets where Telefonica competes are entirely private. The last government-owned shares of the formerly state-owned company have been sold. As of mid-November, TDP had market capitalization of $2.7 billion.

Telephonica's price for telephone service (to dial-up to ISP) (in nuevo soles):

Commercial installation: 520.38 (= US$148.83)
Basic monthly subscription: 55.94 (= US$16.00)
Peak rates: 0.094/minute (= US$0.027)

This year, Telefonica del Peru sold its Internet properties to Terra (which is owned by Telefonica de Espana). Telefonica del Peru was signigicantly underpaid ($30 million) -- a profit-generating strategy by Telefonica de Espana that may be duplicated in other Latin American countries where the dominant telephone provider is owned by Telefonica de Espana. Telefonica's Internet Service (TSI) offers a portal service called Ole Peru with Peru-specific content. This places TSI in direct competition with RCP.

In the year 2000, telephone penetration is expected to be 10% in the country, thanks to investment by Telefonica.

See Also

The next topic in this presentation: A History of Conflict

Sources

- Bourrie, Sally Ruth, "Peru awaits PCS Entrants," *Wireless Week*, June 28, 1998.
- Telefonica del Peru -- Tarifas Servicios Telefonicos Basicos
- Telefonica del Peru -- Variables Significativas

Research and Analysis by Topic

Education: Long-term outlook

(This topic was originally discussed in Presentation 1)

It is most useful to divide analysis of Peru's educational system into Short Term and Long Term components. In the long term, Peru displays great potential, some tapped, some untapped. To begin with, Peru has a respectable literacy rate of 89%, especially considering the large Indigenous population. From this literacy rate we can extract the basic point that if citizens wanted to learn the Internet, most would be able to. In addition, Peruvian content on the Internet would be accessible to most of the population.

Also in the long term, Peru seems to have a very high primary school enrollment, with figures reaching 122% from compulsory primary enrollment. However, upon closer inspection, this number is misleading. Some data report that the actual attendance (as opposed to enrollment) figure in primary school is 59%. This low percentage is likely related to the large incidence of poverty among children and their families, as many children must use school-time to supplement family earnings by working or begging.

This low percentage of primary school attendance is troubling for the big Internet picture in Peru. Studies of the East Asian Tigers (South Korea, Hong Kong, Singapore, and Taiwan) have highlighted the importance of primary education MORE than secondary or tertiary education as being a determinant of success in technological adoption and diffusion. In order to improve the state of primary education, the Peruvian government should step up programs to increase attendance and increase the amount of public expenditure on education (currently > 3% of GDP). The amount of public expenditure may not be as important as the uses to which that money goes. Some possibilities include providing educational resources or incentives to children who would normally have to miss school for economic reasons.

The short term prospects for Peru's Internet development are a bit more promising. Peru can claim a good level of higher level training and education with regard to computing and the Internet. 59% of the universities offer Computer Science degrees, with curricula similar to the United States and for most universities, at least adequate resources. Private universities are more likely to offer better programs and computing resources.

Beyond the universities, other mechanisms exist for Peruvians to learn new Internet technologies. Several vocational schools in Lima offer courses in computing, and one non-profit institution, Red Científica Peruana (RCP) is responsible for much of a more wide-spread Internet training effort in Peru. RCP provides affordable Internet and computer classes and is also responsible for holding conferences, round table discussions, and "informative chats" about the importance and use of the Internet to Peruvians. In addition, Peru has made great strides in spreading this public education of the Internet to citizens in the farther regions of Peru.

See Also

The next topic in this presentation: Education: Short-term outlook

Sources

- Janet Matthews Information Services Quest Economics Database-Countrywise Publishing Ltd, Country Market Report (1998).
- UNESCO Statistical Yearbook
- "Peru." Encyclopædia Britannica Online.
- Government of Peru, *Peru en Numeros* (1997).
- U.S. Central Intelligence Agency, "Peru," *CIA World Factbook* (1999).

Research and Analysis by Topic

Education: Short-term outlook

(This topic was originally discussed in Presentation 1)

The short term prospects for Peru's Internet development are a bit more promising than the long-term outlook. Peru can claim a good level of higher level training and education with regard to computing and the Internet. 59% of the universities offer Computer Science degrees, with curricula similar to the United States and for most universities, at least adequate resources. Private universities are more likely to offer better programs and computing resources.

Beyond the universities, other mechanisms exist for Peruvians to learn new Internet technologies. Several vocational schools in Lima offer courses in computing, and one non-profit institution, Red Científica Peruana (RCP) is responsible for much of a more wide-spread Internet training effort in Peru. RCP provides affordable Internet and computer classes and is also responsible for holding conferences, round table discussions, and "informative chats" about the importance and use of the Internet to Peruvians. In addition, Peru has made great strides in spreading this public education of the Internet to citizens in the farther regions of Peru.

See Also

The next topic in this presentation: Technical Capacity

Sources

- Janet Matthews Information Services Quest Economics Database-Countrywise Publishing Ltd, Country Market Report (1998).
- UNESCO Statistical Yearbook
- "Peru." Encyclopædia Britannica Online.
- Government of Peru, *Peru en Numeros* (1997).
- U.S. Central Intelligence Agency, "Peru," *CIA World Factbook* (1999).

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Research and Analysis by Topic

Going Public

(This topic was originally discussed in Presentation 2)

Offering shares on the Peruvian stock market (Bolsa) or on the New York Stock Exchange (NYSE) in the form of ADRs may be an option for larger infrastructure companies, like Telefonica del Peru (TDP on the NYSE). As of November 5, 1999, TDP had a market capitalization of over $2.7 billion dollars on the NYSE. With this precedent, the RCP could possibly have a successful IPO locally, but not likely in the NYSE.

Going public, particularly offering ADRs on the NYSE, is not a viable option for smaller Peruvian Internet companies, as it is for US start-ups. Whether offered only on the Peruvian Bolsa, or also on the NYSE, neither Peruvian nor international investors are typically willing to take the high risks associated with this yet-unproven model of financing in Peru. One Peruvian entrepreneur we spoke with (Alvaro Ferrand), considered incorporating his Internet business (which provides business to business eCommerce from South America to the United States) in the U.S. to have better access to technology and capital.

See Also

The next topic in this presentation: Financing: Multinational Ventures and Acquisitions

Sources

- Email correspondence with Latin American Venture Capitalist and Entrepreneur from Sandro Trosso
- Conversation with Peruvian Congressman Oswaldo Sandoval Aguirre.
- Conversation with Latin American Venture Capitalist Oswaldo Sandoval Zavala.
- Proyecto De Ley Promocion de la Inversion en Desarrollo Technologico (Law Project for the Promotion of Investment in Technical Development)
- IADB story on Internet for the People

- Endeavor Initiative
- LatPro's "Can the Venture Capital Model Work for Latin America?"
- World Bank
- Inter-American Development Bank
- Red Cientifica Peruana
- Banco de Comercio interest rate table
- The Industry Standard company description of FirstCom Corporation
- Quicken.com/Excite page on FirstCom
- Montealegre, Ramiro, "A temporal model of institutional interventions for information technology adoption in less-developed countries", Journal of Management Information Systems.

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Research and Analysis by Topic

Multinational Ventures and Acquisitions

(This topic was originally discussed in Presentation 2)

Acquisitions of Peruvian companies, joint ventures, and local offices of multinational organizations has proven to be an excellent source of financing, primarily for larger Internet infrastructure companies.

The Peruvian telephone company, Telefonica del Peru was privatized and bought by the Spanish telephone company, Telefonica del Espana. Telefonica del Espana was an excellence source of financing for TDP. Telefonica del Espana purchased TDP for almost $2 billion (many analysts have said that they overpaid!). TDP has invested this money in line expansion and other infrastructural projects, as discussed in the last project. (An interesting aside: Telefonica de Espana is trying to spin out all of its Internet properties and go public with a company called Terra. It is somewhat controversial because Espana purchased these Internet properties from all of its subsidiaries -- including TDP -- at extrememly bargain rates, and will undoubtedly make a lot of money on an IPO.)

FirstCom (formerly InterAmericas Communications) provides high-bandwidth integrated telecommunications services to business customers and to other telecommunications carriers in Latin America. FirstCom has 90 kilometers of fiber-optic cable network in Lima, Peru, another 120 kilometers in Santiago, Chile and other networks in Colombia.

FirstCom issued high yield bonds and had an initial public offering in NASDAQ. This influx of money helped finance its fiber network in Peru. FirstCom believes it is the first licensed long distance carrier to actively begin competing with Telefonica del Peru. Recently, Osiptel, the regulatory body that is supervising the process of deregulating Peru's telecommunications market, mandated that TDP must formally interconnect its network to FirstCom's.

On November 1, 1999 AT&T announced its intention to purchase FirstCom as part of its AT&T Latin America division. FirstCom is based out of Miami, FL.

These precedents suggest opportunities for other information technology related companies to benefit from joint ventures or acquisitions. For example, it is possible that the Peruvian search engine, Yachay, could be purchased by a regional portal company or even Yahoo!.

See Also

The next topic in this presentation: Financing: Multinational Aid

Sources

- Email correspondence with Latin American Venture Capitalist and Entrepreneur from Sandro Trosso
- Conversation with Peruvian Congressman Oswaldo Sandoval Aguirre.
- Conversation with Latin American Venture Capitalist Oswaldo Sandoval Zavala.
- Proyecto De Ley Promocion de la Inversion en Desarrollo Technologico (Law Project for the Promotion of Investment in Technical Development)
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Multinational Aid

(This topic was originally discussed in Presentation 2)

According to the data base on the World Bank web stie, there are currently no World Bank projects in the Telecommunications sector in Peru. Most of the World Bank projects in Peru are focused on alleviating poverty and providing basic health and human services.

There is the potential for future funding of Internet projects, as the World Bank does provide funding for Internet related projects in other countries. Examples include the Indonesia-Information Infrastructure and Applications Development Project which "recognizes the importance of extending and improving the use of information technology (IT) in all areas of the economy, to support national development and to ensure Indonesia's competitiveness in global markets" or the Russia-Russian Information Technology Fund which "involves the provision of equity funding to a number of small and medium sized information technology companies located in the Russian Federation" in which the IFC invested up to $100 million in a VC fund. Another relevant project in Latin America is Venezuela-Movilnet.

The Inter-American Development Bank (IDB) has an Information Technology for Development unit. Part of its mission is "developing cooperation agreements and co-financing arrangements to support research activities, studies, training, seminars, technical assistance and pilot projects." IT FINANCE is an initiative aimed at mobilizing financial resources for Information Technology projects in IDB borrowing member countries. Its objectives include

- Strengthening the case for IT funding within projects funded by IDB.
- Making use of available funding and other support opportunities, focusing on projects and activities in this area
- Designing a regional Technical Cooperation scheme to finance IT projects presented by non-for-profit organizations in IDB's member countries.

The Multilateral Investment Fund (MIF) was established in 1993 as a special fund administered by the IDB to accelerate private

sector development and help improve the climate for private investment in Latin America and the Caribbean. One MIF investment in Peru includes Unit for Diffusion of Technology for SMEs (Small and Medium sized Enterprises). Approved in October 1996 for almost $2 million, "this project will improve the production practices and the competitiveness of small Peruvian businesses, helping them to incorporate new technologies in their production processes". It is not clear how much money has been disbursed for this project or if it applies to Internet technologies, but it is a promising precedent.

In 1997 the IDB Financed the installation of over 1000 public cabins of the RCP, with the backing of the Peruvian government. The total investment in the project by the IDB was $82 million and was linked to other investment from WorldTel mentioned above in Venture Capital.

Red Cientifica Peruana is a good example of an Internet company receiving aid from multinational organizations. In addition to the IDB money mentioned above, other funds provided to RCP include the following.

- The United Nations Develoment Programme (UNDP) provided a small grant (amount unknown) to RCP for basic networking equipment to begin operations in 1991.
- The Organization of American States (OAS) financed a satellite antennae for RCP in 1993.
- The US National Science Foundation (NSF) provided subsidies to RCP for operations out of Florida in 1994
- The Inter-American Development bank provided $82 million to RCPs public cabins project in 1997 (mentioned above).

See Also

The next topic in this presentation: Financing: Other Sources

Sources

- Email correspondence with Latin American Venture Capitalist and Entrepreneur from Sandro Trosso
- Conversation with Peruvian Congressman Oswaldo Sandoval Aguirre.
- Conversation with Latin American Venture Capitalist Oswaldo

Sandoval Zavala.

- Proyecto De Ley Promocion de la Inversion en Desarrollo Technologico (Law Project for the Promotion of Investment in Technical Development)
- IADB story on Internet for the People
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Other Sources of Financing

(This topic was originally discussed in Presentation 2)

Non-governmental organizations are another source of possible funding in the future. For example, The Endeavor Initiative is a nonprofit international development organization that helps emerging-market countries take advantage of entrepreneurial activity.

Endeavor seeks to be the leading supporter of entrepreneurship in emerging markets. Their "Venture Catalyst" model involves 4 steps:

1. Identify a new generation of entrepreneurial talent
2. Create entrepreneurial success stories
3. *Seed local venture capital communities*
4. Build knowledge networks on entrepreneurial best practices

Endeavor works with members of the local investment community to teach them about angel investing and venture capital and to encourage them to finance early-stage, higher-risk ventures. Through Speaker Series events, local venture forums, and the development of Band of Angels networks, Endeavor helps create a dynamic environment where investment happens naturally.

Endeavor has offices in New York, Santiago and Buenos Aires, as well as a network of entrepreneurs, advisors, MBAs and other members throughout North and South America. Endeavor has announced plans to operate in Peru, but has not yet provided a definite date for this office opening. Once it opens an office in Peru, there will likely be an increase in VC and angel investing activity.

Established Peruvian companies that would like to invest in Internet related infrastructure or business can use their **retained earnings** from other business operations. As mentioned above, companies are not given any tax benefits for such investment.

As in the United States, large businesses can often gain a form of financing from vendors who allow for longer credit terms -- this is called **vendor financing**. While we could not find a specific case for this, one Peruvian told us that it would not be unreasonable for a company like Cisco to give the RCP two or three months longer

to pay for networking equipment than another customer. RCP can then invest this money in projects. This is a short-term form of financing, and is most likely not sustainable.

See Also

The beginning of the next presentation: Summary of Presentation 3

Sources

- Email correspondence with Latin American Venture Capitalist and Entrepreneur from Sandro Trosso
- Conversation with Peruvian Congressman Oswaldo Sandoval Aguirre.
- Conversation with Latin American Venture Capitalist Oswaldo Sandoval Zavala.
- Proyecto De Ley Promocion de la Inversion en Desarrollo Technologico (Law Project for the Promotion of Investment in Technical Development)
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Research and Analysis by Topic

Summary of Presentation 3

(This topic was originally discussed in Presentation 3)

Our final analysis of the Internet Revolution in Peru focuses on an examination of two case studies, Red Científica Peruana (a.k.a. RCP, a nonprofit Internet Service Provider) and Telefonica del Peru (the dominant telecommunications carrier, and a former state-run monopoly). In our oral presentation, we used a boxing metaphor to analyze the rare Peruvian situation where in the Internet service market, we have a small non-profit organization and a large, foreign-owned for-profit corporation in direct competition. (Surprisingly, in terms of market share alone it might be said that the non-profit organization is winning.)

To understand the Internet and the potential for an information revolution in Peru, we begin with an analysis of the history of telecommunications and telecommunications policy in the country, then analyze Telefonica and RCP chronologically as case studies.

See Also

The next topic in this presentation: Origin of Telecommunications (1920-1990)

Sources

- Red Científica Peruana (RCP)

Research and Analysis by Topic

Origin of Telecommunications (1920-1990)

(This topic was originally discussed in Presentation 3)

For the bulk of this century, prevailing economic theory held that telephone service was a market governed by the principle of *Natural Monopoly*. To oversimplify, this means that the largest firm would be the most efficient--maximizing consumer benefit would be synonymous with sanctioning a monopoly. Many nations around the world (but not the United States) instituted a state-owned monopoly in accordance with this theory.

The early providers of telephone service were small private companies that were later nationalized by the state. For instance, in 1920 La Compania Peruana del Telefonos Limitada (CPTSA) was created to provide local and long distance telephone services in Lima. The government's approach to telecommunications shifted at the end of the 1960s, when it joined most other nations around the world in sanctioning a national telecommunications monpoly. In 1969 ENTEL (Nacional del Telecomunicacions del Peru) was created to offer domestic and international long distance to all of Peru as a state-owned monopoly. A subsequent wide-reaching telecommunications law was passed in 1971.

By the end of the 1980s, however, the technical capability of Peruvian telecommunications was sorely lacking. At this time the trade press ranks Peru as one of least developed telecom networks in Latin America. Telephone service under ENTEL was marked by low line penetration, low quality of service, high rates, and long waits for service.

See Also

The next topic in this presentation: Telecommunications Reform Act (1991)

Sources

- O'Neill, Judith. (January 1991). "Dynamics of Telecommunications Sector Restructuring." *Telecommunications Int'l Edition*, pp.

70-75.

- Telefonica del Peru -- Resena Historica

Research and Analysis by Topic

Sources of Financing Overview

(This topic was originally discussed in Presentation 2)

Early stage financing is basically nonexistent at an institutional level in Peru. The only cases our "experts" (see sources, below) have heard of are government agencies and NGO's providing financing for small firms, but not necessarily for the Internet. To date our experts have not heard of any Internet startup receiving finance with the exception of la Red Cientifica Peruana (RCP), who received millions of US dollars to put in place their Internet booths across the country to develop civil society.

The most promising source of funding is for larger infrastructure-related projects (such as TDP or RCP) which can come from a multinational lender. Medium sized businesses using the Internet may be eligible for government subsidies or tax breaks, but small "start-up" type businesses have few resources beyond the investment of the entrepreneur and the rare angel investor.

See Also

The next topic in this presentation: Financing: Venture Capital

Sources

- Email correspondence with Latin American Venture Capitalist and Entrepreneur from Sandro Trosso
- Conversation with Peruvian Congressman Oswaldo Sandoval Aguirre.
- Conversation with Latin American Venture Capitalist Oswaldo Sandoval Zavala.
- Proyecto De Ley Promocion de la Inversion en Desarrollo Technologico (Law Project for the Promotion of Investment in Technical Development)
- IADB story on Internet for the People
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Research and Analysis by Topic

Venture Capital

(This topic was originally discussed in Presentation 2)

The nature of Venture Capital financing in Latin America is such that few VC funds would invest in a purely country-specific Internet venture. VC money is typically only available to companies that can scale to larger Latin American and Caribbean regional markets. There are no traditional venture capital funds established specifically for Peru. There are VC funds that invest in emerging markets, including Latin America, and a few that invest exclusively in Latin America. Of the VC funds surveyed, none had any investments in Peru at this time. This was not due to anything structurally wrong with Peru, but merely the lack of entrepreneurial activity serving regional markets coming from Peru. One entrepreneur we surveyed was in the process of seeking VC funding for his Internet startup. The VC funds surveyed were:

- Explorador.net: said they would invest in a Peruvian start-up if the right one came along and served the Latam region
- Flatiron Partners: has made investments such as StarMedia and Patagon.com
- Chase Capital Partners: investment in Argentina and Chile, but not Peru

Andrew Cummins, from Explorador.net provided insight into the lack of VC funding in Latin America in general. He sited a general lack of an entrepreneurial culture which includes innovation, risk taking, trust, and social acceptance of "failure". In Peru, the outlook for a culture of innovation is bright, as respected institutions encourage innovation through awards such as the *Premio de Creatividad Empresarial* which awards businesses in several industries for creativity, innovation, and other achievements. Such public esteem for innovation is a step in the right direction for attracting future VC capital. More information about the *Creatividad Empresarial* award can be found in the background paper on "The Firm and Innovation in Peru".

There has been some activity from Institution Investor funds. The Inter-American Development Bank and WorldTel identified an Internet Service Center proposal for Peru as the first case in their joint program to identify and finance communications projects that would benefit poor and rural populations in Latin America and the

Caribbean. WorldTel operates on behalf of major institutional investors in identifying and managing investments in telecommunications projects, and it provided equity capital for the project. Its major investors include GE Capital and AIG from the United States, National Westminster Bank Plc from the United Kingdom, and, from Kuwait, International Investment Group (IIG), Kuwait Financial Center and Burgan Bank. WorldTel announced plans to provide RCP with debt and equity finance for a $125 million project to build 1,000 new cabins throughout Peru.

See Also

The next topic in this presentation: Financing: Banks

Sources

- Email correspondence with Latin American Venture Capitalist and Entrepreneur from Sandro Trosso
- Conversation with Peruvian Congressman Oswaldo Sandoval Aguirre.
- Conversation with Latin American Venture Capitalist Oswaldo Sandoval Zavala.
- Proyecto De Ley Promocion de la Inversion en Desarrollo Technologico (Law Project for the Promotion of Investment in Technical Development)
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- Endeavor Initiative
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Research and Analysis by Topic

Intellectual Property Overview

(This topic was originally discussed in Presentation 2)

Peru has taken several important steps toward recognizing intellectual property. It is a member of several important multilateral intellectual property conventions such as the Berne Treaty (1963), the Universal Copyright Convention (1963), and the Andean Pact, together with Bolivia, Colombia, Ecuador, and Venezuela. The Andean Pact (also known as the Cartagena Agreement) sets up preferential customs regulations for trade as well as sets standards for trademark registration and protection in member countries. The Peruvian government has also established institutions, such as INDECOPI, which facilitates entrepreneurs with intellectual property and trademark issues, but is more beaurocratic than effective. Despite these gains, intellectual property rights enforcement is lacking. Textbooks, books on technical subjects, audio cassettes, motion picture videos, and especially software are widely pirated. It is estimated that 75% of businesses in Peru use pirated software and it is also on the U.S. Trade Representative's Special Watch list for having serious intellectual property rights deficiencies, along with much of Latin America. Therefore, despite the government's legislation and international agreements, intellectual property protection in Peru is, in reality, not strong. The consequences for internet development are that a company may be less willing to market a product on the Web or develop electronic commerce in a climate of relaxed protections.

See Also

The next topic in this presentation: Sources of Financing Overview

Sources

- Instituto Nacional de Defensa de la Competencia y de la Proteccion de la Propiedad Intelectual (INDECOPI)
- U.S. Copyright Office
- KPMG, *Handbook on Investment in Peru*. KPMG (1997).
- TradePort International Trade report

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Research and Analysis by Topic

RCP's Beginnings (1991-1994)

(This topic was originally discussed in Presentation 3)

In 1991, RCP was founded as an academic & research network -- a situation similar to the beginnings of the Internet in the United States. What is today the largest ISP in Peru came from meager beginnings: namely, a small networking grant from UNDP (US $3,000), 10 people, a 386 PC, and 3 modems. Moving forward, RCP obtained financing from international organizations and embarked on a program of infrastructure expansion, quickly adding nodes throughout country.

In 1994, RCP established itself as the first ISP in Peru. At this time, it was still focused on academic & research goals. Structurally, it was a self-sufficiency cooperative established as a non-profit company. Users pay a low monthly fee for network access and to be considered cooperative members.

A key point is that RCP was very innovative in this time period. While in other areas Peru has lagged behind the rest of the world in adoption of new telecommunications services, RCP was very fast on the Internet scene. RCP's Web site was one of first 350 web pages to exist.

See Also

The next topic in this presentation: RCP: Creating an Internet Culture

Sources

- Red Cientifica Peruana (RCP)

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Research and Analysis by Topic

Creating an Internet Culture

(This topic was originally discussed in Presentation 3)

RCP approached the Internet with a very progressive model. Universal access was, from the beginning, a prime concern. In order to realize a market need for Internet service, RCP worked to create an Internet culture in Peru by providing content that fulfilled social needs.

For example, with RCP's Proyecto Ciudadano, RCP created Web sites for people outside Lima to find info about citizen's rights, public services, databases to aid organizations, and public institutions. RCP viewed this as the "Internet for democratization."

Education is also central to the creation of widespread Internet use in Peru. RCP offers an ongoing series of "Informational chats" throughout the country, where representatives talk to people about importance of Internet. RCP is also a leader in providing technical training. Training is free to RCP members, and RCP offers general computer & Internet classes to the general public for reasonable rates.

RCP has also worked to foster entrepreneurship. In RCP's cabinas publicas program, potential owners of public Internet access sites are given assistance in establishing the site as a business franchise.

See Also

The next topic in this presentation: RCP: Cabinas Publicas

Sources

- Red Cientifica Peruana (RCP)

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Research and Analysis by Topic

Summary of Presentation 1

(This topic was originally discussed in Presentation 1)

The story of the Internet in Peru might well be characterized with the phrase "decent seeds, good watering." Such a description gets at a salient point for technology diffusion throughout Latin America-how to balance generally difficult starting points (such as poverty, lack of strong education, or social inequity) with the conditions that are necessary for a technology such as the Internet to flourish. In Peru, what are the "decent seeds," and in what ways are those seeds being watered? The answers lie in an analysis of Peru's demography and geography, labor market framework, educational system, and technological capacity. Addressing the above factors inevitably brings up related questions on the nature of opportunities and access to the Internet in Peru, asking the critical question of "The Internet for whom?"

- Peru's demography and geography are addressed to get at the inescapable realities that Peru as a country faces. What does the country look like? How might geography affect other factors such as technological capacity or the labor force? And, in turn, how do these factors affect the Internet?
- The labor market framework in Peru is highly relevant because it gets at two imperative questions:
  1. How will the new technology of the Internet infiltrate people's economic lives, that is, their lives at work?
  2. How might people's occupation (and wages) affect their access to the Internet?
- Education is a critical element for any country's adoption of technology. Analysis of Peru's educational system reveals a useful division between long term and short term education, addressing primary, secondary, tertiary, and vocational education systems as well as Internet specific education initiatives offered by non-traditional educative entities.
- Technical capacity traces through a brief recent history of telecommunications provision in Peru, including vast improvements in teledensity, wait for a phone line, and above all, a phenomenal growth rate of the Internet in Peru.
- The nature of access to Internet opportunities in Peru must

be addressed to assess how this new technology is filtering through to different sectors of the Peruvian population. For example, is the Internet taking down barriers to Social equity or augmenting barriers? What sort of people can really afford to use the internet? Who is being left behind?

- Finally, we have included a section about Red Cientifica Peruana to highlight one highly innovative group that has taken great strides in promoting the use and expansion of the Internet in Peru, resulting in some innovative solutions and projects to address the inevitable obstacles in Peru's information highway.

See Also

The next topic in this presentation: Geography and Demography

Sources

- Red Científica Peruana (RCP)

Research and Analysis by Topic

Telecommunications Reform Act (1991)

(This topic was originally discussed in Presentation 3)

As we have noted elsewhere, in the 1990s, there had been a dramatic improvement in the technical capacity of the country and a rebirth of the telecommunications network. To explain the cause of this we must look to the telecommunications reform movement in Peru at the beginning of the 1990s.

By 1990, several other countries in Latin America and around the world were making drastic changes to their (often state-run) telecommunications monopolies. A market-based solution was now seen as the right way to maximize investment. In Latin America particularly, there were high hopes for an influx of cash via foreign investment, which was generally prohibited before this.

As Mr. Luis Maravi, vice-minister for Telecommunications stated in 1991: "We want to modernise, to keep state participation small but strong." This was the stated goal of reform regulation (although state participation in the dominant carrier, Telefonica del Peru, would later cease to exist as of July 1999). Not only was the country's technical capacity seen as lacking, it's regulatory instruments were thought to be outdated and restrictive. The last Telecommunications act was passed twenty years ago (in 1971).

In 1991, this culminated with Decreto Legislativo (Legislative Decree) 702, an act describing a drastic restructuring of the telecommunications sector. The act will:

- Phase out the state-run monopoly (ENTEL)
- Allow foreign investment
- Transition to liberalized market (i.e., competition)
- Create a new specialist regulatory agency (OSIPTEL)
- Formalize a complaint process

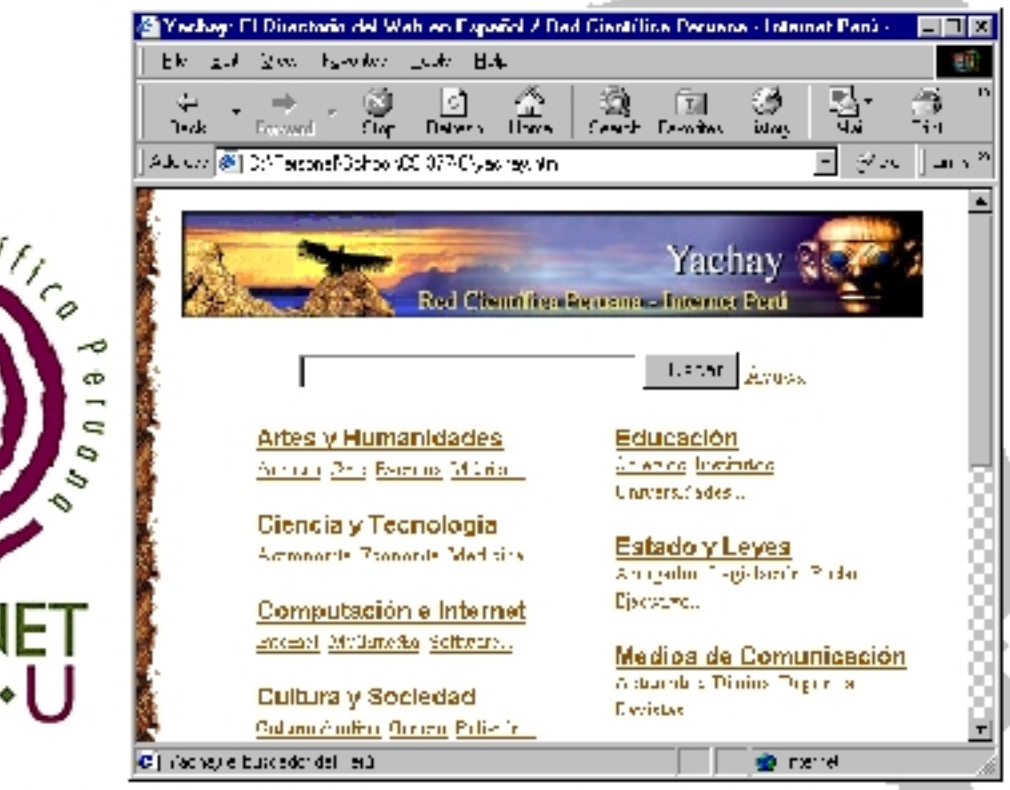
Despite this significant step forward, no major action would result on this front until 1994, due to political turmoil and the press of other issues in the Peruvian government.

See Also

The next topic in this presentation: Telecommunications Privatization (1994)

Sources

- Organismo Supervisor de Inversion Privada en Telecomunicaciones (OSIPTEL)
- Bowen, Sally. (August 9, 1991). "Peru Telecoms Market Connection" *Financial Times* (London), p. 3.
- O'Neill, Judith. (January 1991). "Dynamics of Telecommunications Sector Restructuring." *Telecommunications Int'l Edition*, pp. 70-75.
- "Telecom Boom" (October 1997). *Latin Trade*, 5 (10), pg. 48.



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Technical Capacity Internet: Remarkable Growth

- **Personal Computers per 1,000**
  - 1996: 5.9 1997: 12.3 1999: 27.9 (est.)
- **10-12 Nat'l Internet Service Providers**
- **An Internet Growth Leader**
  - 3.2 Internet hosts per 10,000 (7,805)
  - + 204% over last 12 months
- **Dominant ISP: Red Científica Peruana**
  - User-owned cooperative
  - Cabinas Públicas & Franchising

SOURCES: World Bank Development Report, 98/99 Global Competitiveness Report, 1999 http://thelist.internet.com, http://www.isc.com

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Opportunity

Promoting Peruvian Content

- The RCP site itself & Yachay search engin
- Hosting Local groups (from Games to Veterinarians)
- Enabling NGOs & Advocacy
  - *If you can't speak with Peruvian Indians, you can see their advocacy site*

SOURCES:
http://www.yachay.com
ekeko.rcp.net.pe/tashaninka/coppip/CongQuech.html

Conclusions

- **Still a ways to go**
  - Education, Dispersion, Poverty
- **“Decent Seeds, good watering”**
- **RCP enables a real potential success story**

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Labor

- **Total Labor Force: 32.6% of population**
- **Unemployment: 7.7%**
- **Informal: 40% Formal: 40.7% “Small Business”: 19.4%**
- **Underemployment difficult to measure**
- **Agriculture is a relatively small sector (7% of GDP)**

SOURCES: www.ilo.org/public/english/80relpro/publ/wlr/97/annex/index.htm
www.odci.gov/cia/publications/factbook/pe.html
www.oit.org.pe/spanish/260ameri/info/estadis/estadis.shtml

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Education: Short Term Good higher level training / education

- **Universities: 59% offer CS degrees**
  - Similar to US curricula
  - Adequate resources (58 students/computer)
- **Vocational Schools**
  - Several in Lima offer courses in computing
- **Public Training: RCP takes the lead**
  - Affordable Internet and computer classes

SOURCES: Peru en Numeros, 1997 http://andromeda.pucp.edu.pe

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Education: Long Term Investment is the key to success

- **High Literacy Rate (89%)**
  - Employees can be trained at Institutes
- **High Primary Enrollment (122%)**
  - Only in theory: actually closer to 59%
  - Key to long-term technology learning
- **Public Expenditure on Education**
  - Not high enough ([% of GDP)

SOURCES: http://www.odci.gov/cia/publications/factbook/pe.html UNESCO Statistical Yearbook Janet Matthews Information Services Quest Economics Database Countrywise Publishing Ltd, Country Market Report, 1998

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Opportunity Promoting Peruvian Content

- **The RCP site itself & Yachay search engine**
- **Hosting Local groups (from Games to Veterinarians)**
- **Enabling NGOs & Advocacy**
  - If you can't speak with Peruvian Indians, you can see their advocacy site

SOURCES: http://www.yachay.com ekeko.rcp.net.pe/ashaninka/coppip/CongQuech.html

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Red Científica Peruana

http://ekeko.rcp.net.pe

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Opportunity Many Still Excluded

- ## Dispersion
  - Teledensity outside of Greater Lima
- ## Content
  - Local Content & language concerns
- ## Poverty
  - 54% of Population below poverty line
  - Poorest 20% = 4.9% Consumption, Highest 10% = 34.3%

SOURCES: World Bank Development Report, 1996
http://www.odci.gov/cia/publications/factbook/pe.html

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Opportunity Doing Well With the Situation

- **RCP Truly Believes in Universal Access**
  - Cabinas Publicas for $15/month, shared cooperative profits
  -
  - 110 Cabinas in Lima, 60 dispersed, with more on the way
  -
  - Providing local content, service, and hosting

SOURCES: http://cabinas.rcp.net.pe/ http://www.iadb.org/exr/IDB/stories/1997/eng/e11f2.htm

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RCP and Telefonica del Peru

"The Ring"

- Each competitor "bounded" by Peruvian reality
  - Decent education system (widespread literacy)
  - High poverty & social inequity
  - Largely urban population with inaccessible interior
  - Typical Internet user: Educated, Urban, and middle-upper class.

2

Telecom Beginnings

Gov't origins of today's sector

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1

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Telecom Reform Act

Regulatory changes set the stage

- Some of "most backward" regulations
  - One of last countries to implement reform
- 1991: Decreto Legislativo 702
  - "to keep state participation small but strong"
  - Phases out state-run monopoly
  - Allows foreign investment
  - Transitions to liberalized market
  - Creates new regulatory agency (OSIPTEL)
  - Formalized complaint process

2

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Telefonica del Peru

Privatization changes the landscape

- 1994: Telephone Industry Privatized
  - ENTEL and CPTSA controlled by Telefonica Peru Holding SA
  - Telefonica is sold to Telefonica International of Spain (TISA) at auction for almost $2 billion
  - TISA given 5 year exclusivity period to modernize.

2

5

Red Científica Peruana

Network beginnings

- 1991: Started academic & research network
  - Does this sound familiar?
- Meager beginnings
  - Small networking grant from UNDP
  - US $3,000, 10 people, 386 PC, 3 modems
- Infrastructure expansion
  - Financing from international NGOs
  - Added nodes throughout country

2

6

RCP: Internet host

A new role

- 1994: Established 1st ISP in Peru
- Still focused on academic & research
- Self-sufficiency cooperative
  - Non-profit company
  - Users pay low monthly fee (membership)
- Kept pace with rest of world
  - One of 1st 350 web pages

2

7

RCP: Vision of Internet

Progressive model of access

- Universal access model
- Cooperative nature benefits consumers
- Realize "market need" for Internet
  - Social need, eg. legal, nutritional, & work force development information
  - "Proyecto Ciudadano"
- Ability to innovate
  - Need-specific use of different technologies

3

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RCP: Education

Knowledge deployment

- "Informational chats"
  - Talking to people about importance of Internet
  - Established wider consumer base
- Provided technical training
  - Free Internet training to members
  - Offer computer & Internet classes to the public
- Foster entrepreneurship
  - Assist potential owners in franchising business

3

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RCP: Public Cabins

Universal Internet access

- Alternate model for access
  - Don't assume everyone has telephone
  - Brings access to those without hardware
- Good penetration
  - Low monthly fee
  - 200 under responsibility of RCP
  - Even more private franchises, totaling 600

3

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Telefonica del Peru

Investment expands infrastructure

- 1995: More Efficient Line Installations
  - Avg. wait plummets from 35 to 5 months
  - Network digitization at 77%
- 1996: Huge Investments/More Capital
  - $1.5 billion in infrastructure since 1994
  - Telefonica issues ADRs on NYSE (TDP)
  - State shares offered publicly in Peru
- 1997: Doubled Phone Line Penetration
  - From 3.4% to 6.7% since privatized in 1994

3

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Telefonica del Peru

End of monopoly brings competition

- 1997: Court Requires Interconnectivity
  - BellSouth enters Lima wireless via Tele2000
  - Court requires Telefonica to provide access to national cellular network for competitors
- 1998: Early End of Telephone Monopoly
  - One year ahead of schedule
  - Telefonica market share falls from 76% to 66%
- Increased Competition
  - RCP in Internet service
  - FirstCom in long distance

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Telefonica del Peru

Challenges for today

- 1995?-98: Weak Internet Offering
  - Only 2,000-4,000 subscribers
- Continue Building Infrastructure
  - Network digitization reaches 90%
- Acquired Small ISPs
  - Built subscriber base to ~50,000 by 1998
  - Paid about $4 million

3

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Telefonica del Peru

Moving fast...

- Telephone Rates Are Competitive
  - Commercial installation: $150
  - Monthly fee: $16
  - Per minute charge: 3 cents
- Sold Internet Properties to Terra
  - Owned by Telefonica de España
  - Telefonica was underpaid ($30 million)
- TSI & Olé Peru
  - TSI competes with RCP
  - Olé Peru promises to be a winner portal

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Telefonica del Peru

Challenges for the future

- Goals For Improved Network
  - 10% line penetration by 2000, 20% by 2003
  - 100% network digitization
- Role of New Ownership?
  - Probably much more competitive

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RCP vs. Telefonica

A history of conflict

- Customer in conflict with supplier
  - RCP uses TDP's telecommunication lines
- Compete for ISP market
  - RCP: 56%, Telefónica and IBM: 44%
- Telefónica accused of unfair practices
  - Stalling line installation to RCP clients
  - Charged with cutting lines to discredit RCP
  - Prevented use of Aplio (Internet telephony)
  - Use of lobbying power with governing agency

3

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RCP: Today and tomorrow

Challenges for the future

- Wide impact
  - 25-40,000 final users
  - Valued at US $20 mill
- Continual growth
  - International expansion
    - Started in El Salvador
    - Other countries asked for help
  - Thinking about selling much of company
    - Revenue will be used to offer more services

3

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Conclusions

"An ironic Symbiosis"

- Attacking the same obstacles...
  - Both want higher telecom penetration
  - Both want more Peruvian users
  - Both want better infrastructure
- ...From different directions
  - RCP creates the "Peruvian Internet Culture"
  - Telefonica provides the infrastructure
- "The Dreamer" & "The Necessary Giant"

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PPT Slide

Telefonica vs. RCP: The Main Event

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Conclusions RCP--an alternative model

- **Social or Economic? Both.**
- **Grassroots beginnings & the power of networking**
- **Funding? Self-sufficiency**
- **Sustained dedication to the "dream"**
  - Education & Outreach, Innovative Programs
  - True Believers in "Internet for Democratization"
- **The Spirit of the Internet**

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Conclusions Who is outside the ring?

- **Is there enough Peruvian content?**
- **A promising and uplifting picture--for whom?**
  - Main obstacle on user end is economic
    - $15 a month is affordable, but not for everyone
    - Money affects more than access
  - Does “the dream” match reality?

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RCP: Education Knowledge deployment

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Telecommunications Policy

"to keep state participation small but strong"

- Telecom Reform Act Passed in 1991
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  - Allowed foreign investment
  - Specified transition to liberalized market
  - New specialist regulator, complaint process
- Privatized Telefonica in 1994
  - Bought by TISA of Spain
  - Five-year exclusivity period

Telecommunications Policy

"It sounds worse before it sounds better..."

- Telecom reform shows mixed results
  - Growth in users, drop in rates
  - Massive investment by TISA ($1.5 bn)
  - Initially, large number of complaints
  - All competition centered on Lima wireless
    - Wireless shows *higher* growth
- Present outlook
  - Market now entirely private
  - Judiciary has required interconnection

Telecommunications Policy “to keep state participation small but strong”

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Sources of Financing

Good prospects for the future

- Regional VCs would invest in Peru
  - If the project and entrepreneur were "right"
  - Growing culture of innovation in Peru
- Endeavor Initiative
  - Can educate Peruvian VCs and Angels
  - Unknown when they will come to Peru
- Potential Acquistions/IPOs
  - www.yachay.com

Conclusions: Obstacles outnumber opportunities

- Telecom sector growing, contested
- Intellectual property enforcement lacking
- Internet not on policy agenda
- Poverty, health, and education projects have attention of multinat'l aid agencies
- Internet entrepreneurship must precede venture funding
-

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Technology Policy

Not the first priority

- "Promote" investment in technology
  - Institutions established (e.g., CONCYTEC)
  - Guarantee loans
- Incentives not politically feasible
  - No tax incentives or subsidies
  - New law shot down: afraid of corruption
  - Not as high a priority as poverty/education

Sources of Financing

Medium & Large Companies: External

- Going Public: NYSE ADRs
  - TDP has market capitalization of $2.7bn
- Multinational Organizations
  - RCP is biggest success: UNDP grant, OAS financing, NSF subsidy, IDB ($82mn)
- Acquisition by MNCs/Joint Venture
  - TISA has invested $1.5bn in Telefonica
- Institutional Investor
  - WorldTel invested $125mn in RCP

Sources of Financing

Small companies don't have options

- No Venture Capital Funding Currently
  - LatAm VC funds *could* invest someday
- Some Angel Funding
  - Mostly wealthy relatives
- Little Access to Bank Loans
  - Requires personal collateral
  - Interest too high

Sources of Financing

Notable shortcomings

- No tax incentives or subsidies
- No Venture Capital or Angel Network
- No World Bank loans in telecom
  - Poverty alleviation is priority

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Creating Internet Opportunities: Public and Private Initiatives

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Intellectual Property Policy Steps toward protection

- **Member of multilateral IP conventions**
  - Berne Treaty (1963)
  - Universal Copyright Convention (1963)
- **Facilitating Agency: INDECOPI**
- **Computer programs not explicitly recognized as literary works**
- **Sanctions: few legal recourses**

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Sources of Financing Medium & Large Companies: Internal

- **Bank Loans/Credit (short term)**
  - High interest rates (15%-167%!)
- **Government role**
  - Guarantee loans: ex. RCP and WorldTel
- **Going Public “Bolsa de Valores”**
  - Telefonica (TDP)
- **Vendor Financing (short term)**
- **Retained Earnings**

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