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PERU

Contents

1)   Introduction

Perú initiated the reform of its telecommunication sector in 1992, with the privatization of the state-owned Empresa de telecomunicaciones del Perú (ENTEL) and Compañia Peruana de Teléfonos (CPT). At the same time, a regulatory body was established, in the Organismo Supervisor de la Inversión Privada en Telecomunicaciones (OSIPTEL).

The provision of telecommunication services in Peru is more expensive due to its mountainous geography. Another important institution in the telecom sector is thus the Fund for investment in telecommunications (FITEL), which seeks to boost telecommunications growth in remote and mountainous areas and the poorest districts of the country. Its incomes are obtained through a 1 percent levy charged on the gross operating revenues of telecommunication companies.

FITEL has allocated funds in two stages. In the first stage, there were eight projects in three phases. During the first phase, funds were used to subsidize the provision of payphones to 213 rural villages in Peru's Northern jungle region. During the second phase, 1937 small villages in Southern, Central and Northern areas were integrated into the programme and the programme continued to grow slowly.

2) Application of the Digital Opportunity Index to Perú

2.1 Application of the Digital Opportunity Index in Perú

At this time, it is possible to apply the Digital Opportunity in my country, because we have most of the data necessary to calculate this Index.

The Digital Opportunity index (DOI) is a composite Index based on three components: Opportunity, Infrastructure and Utilization and sufficient information exists to be able to calculate most of them.

The different sources of information include:

- The National Household Survey carried out by the National Institute of Statistics and Informatics and addressed to a sample of households at the national level. It is carried out every year. Through this Survey, three of the DOI Indicators are obtained.

- Administrative Record from Telefónica del Perú, the most important enterprise of Perú in the provision of Telephonic Services.

- Questionnaires that the International Telecommunication Union sends every year to Government telecommunication agencies.

- A Census in order to get Information about Informatics Resources has been carried out by National Institute of Statistics and Informatics, among others.

The availability, reliability and accuracy of these types of data is very important. Reliable basic information and data should lead to a more accurate index and the improved quality of the indicators or indexes will lead to the application of appropriate policies.

Finally, from my point of view, the Digital Opportunity Index (DOI) should form part of the national Official Statistics in order to develop a data time series that would allow the monitoring of trends and progress in Digital Opportunity and ICTs in Peru.

Table 1: DOI structure

Indicator	Goal post	Indicator Weight	Category Weight
Opportunity			
Percentage of population covered by mobile	100	33%	33%
Internet access tariffs as a % of per capita income	0	33%	
Mobile tariffs as a & of per capita income	0	33%	
Infrastructure			
Proportion of households with a fixed telephone	100	20%	33%
Mobile cellular subscribers per 100 inhabitants	100	20%	
Proportion of households with Internet access	100	20%	
Mobile Internet subscribers per 100 inhabitants	100	20%	
Proportion of households with a computer	100	20%	
Utilization			
Internet users per 100 inhabitants	100	33%	33%
% of fixed broadband in fixed internet subscriber	100	33%	
% of mobile broadband immobile Internet subscribers	100	33%	

Table 2: Calculation of the DOI for Peru in 2004

Digital Opportunity Index (DOI) for Peru in 2004

Components	2004
Opportunity	**0,86**
Percentage of population covered by mobile cellular telephony	0,80
Internet access tariffs as a percentage of per capita income	0,89
Mobile cellular tariffs as a percentage of per capita income	0,89
Infrastructure	**0,11**
Proportion of households with a fixed line telephone	0,25
Mobile cellular suscribers per 100 inhabitants	0,15
Proportion of households with internet access at home	0,06
(Mobile) Internet subscribers per 100 inhabitants	0,01
Proportion of households with a computer	0,07
Usage	**0,21**
Number of individuals that used the Internet	0,12
Ratio of broadband in fixed Internet subscribers	0,51
Ratio of broadband in mobile Internet subscribers	
DOI	**0,39**

Source: ITU/KADO

Of the three components, Infrastructure is the lowest, mainly due to the low number of households with internet access and/or PCs at home and the low number of mobile Internet subscribers per 100 inhabitants.

2.2 What is interesting and special about the situation with regards to ICTs in Peru.

During 1993, there was only one Private Company Telefónica del Perú that provided telephonic services, but its services were too expensive for most of the local population to be able to afford them.

In 1994, the cost of installation of a new line was at least $607.00 or more.

After nearly ten years, in 2003, the Congress approved by law the elimination of basic telephone rental charges. However, the President of the Republic did not give his approval and asked the regulatory authority OSIPTEL and Telefónica renegotiate this an agreement. Subsequently, Telefónica submitted a new proposal and this was approved.

Table 3: Main plans submitted by Telefónica

| Plans	Monthly Tariff	Free minutes	Cost per minute Normal time	Cost per minute Reduced. time
Classic Line	57.77	60	0.092	0.042
Plan 1	39.90	60	0.140	0.070
Plan 2	64.90	270	0.128	0.064
Plan 3	74.90	365	0.116	0.058
Plan 4	84.90	470	0.1006	0.053
Plan 5	94.90	580	0.092	0.042
Plan Low Consume	39.90	60	0.1398	0.0702

Source: Telefónica S.A

3 Applying some of the DOI indicators to a regional analysis of the digital divide within Perú

According to the National Households Survey results, the percentage of households with fixed telephony at the national level has been increasing smoothly from 20.4 % in 2001 to 26.6 % in 2005. The proportion of households with a Cellular telephone has been increasing quickly from 7.6% to 19.5% . However, the percentage of the households with Internet at home is low from 0.5% in 2001has increased to 3.6% in 2005.

Analyzing these trends over time provides valuable information about the rate of increase of household access to telecommunications and shows that fixed telephony is the predominant mean of household communications in Perú.

Figure 1: Household Penetration of Telecommunications
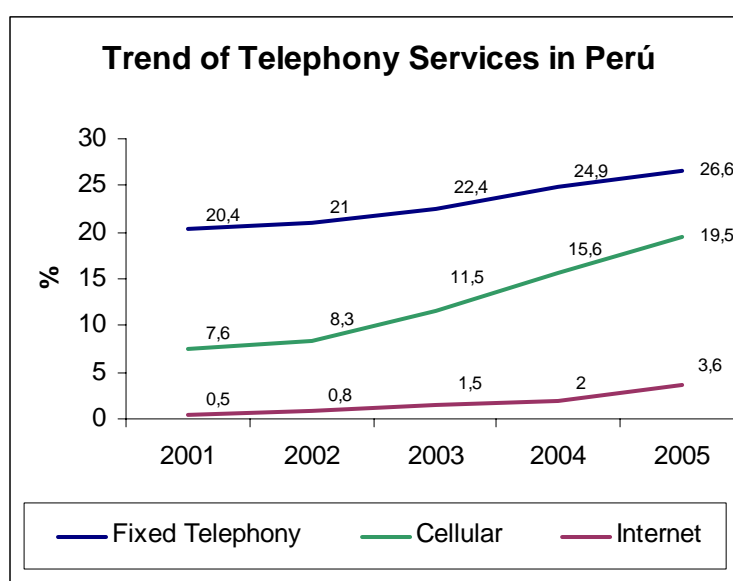
Source: National Households Survey, National Institute of Statistics and Informatics.

In analyzing urban areas, there is a need to analyze Urban Lima separately, because it is the Capital City. There is a big gap in the percentages achieved in all indicators between Urban Lima and other Urban areas: for example, the percentage of households with fixed telephony in Lima reached 40.8 % in 2005, while other urban areas achieved a lower overall proportion, at 26.9 %.

About 30 percent of Peru's population in rural areas has been largely excluded from access to the telephony services. The percentage of rural households with fixed telephony was 0.5 % in 2005, while the percentage of rural households with access to cellular telephony was 1.7 %.

Table 4: Proportion of households with telephony services by region, 2001-2005

Proportion of Households with thelepony services by region, 2001-2005
(% of the total households by region)

Access to the telephony services	2001	2002	2003	2004	2005
Total country					
With telephony services					
Fixed telephony	20,4	21,0	22,4	24,9	26,6
Cellular	7,6	8,3	11,5	15,6	19,5
Internet	0,5	0,8	1,5	2,0	3,6
Without telephony	75,6	74,6	72,4	67,9	64,3
Area of residence					
With telephony services					
Urban (Include Lima Metropolitana)					
Fixed telephony	31,1	31,9	34,3	38,2	40,8
Cellular	11,3	12,4	17,3	23,3	29,2
Internet	0,7	1,3	2,2	3,0	5,5
Without telephony	63,2	61,6	58,1	51,5	46,4
Urban (Exclude Lima Metropolitana)					
Fixed telephony	20,3	21,6	23,1	25,8	26,9
Cellular	6,0	7,9	10,6	14,9	21,2
Internet	0,2	0,5	0,4	0,8	1,7
Without telephony	75,6	72,9	70,1	64,4	60,0
Rural					
Fixed telephony	0,3	0,4	0,2	0,5	0,5
Cellular	0,7	0,5	0,6	1,6	1,7
Internet	-	-	-	-	-
Without telephony	99,0	99,0	99,2	98,0	97,5

4   Applying the DOI to an analysis of the gender digital divide in Perú

At this time, there is insufficient information to permit the analysis or application of DOI by gender.

5   Comparing Digital Opportunity among Latin-American Countries

Table 5 presents a comparison of Digital Opportunity scores and rankings for Latin American Countries.

Chile and Argentina achieved the highest level of the DOI in 2004/2005, at 0.52 and 0.47 respectively, while Perú achieved an overall DOI of 0.39. Among its components, Opportunity has the highest value (0.86) and the lowest was in Infrastructure (0.10). Peru scores more highly than Ecuador, Bolivia and Paraguay, which occupies the last position in the table.

Table 5: Comparison of Digital Opportunity among Latin American Countries

Rank in Latin America and World 2004/2005

Latin America Rank	Country	Opportunity	Infrastructure	Utilization	Digital Opportunity Index	World Rank
	Latin America	0,89	0,19	0,13	0,40	
5	Chile	0,96	0,31	0,29	0,52	40
6	Argentina	0,96	0,30	0,15	0,47	51
13	Uruguay	0,96	0,24	0,09	0,43	64
16	Venezuela	0,93	0,18	0,18	0,43	67
19	Brasil	0,87	0,24	0,16	0,42	71
20	**Peru**	**0,86**	**0,10**	**0,21**	**0,39**	**85**
25	Ecuador	0,89	0,16	0,02	0,36	100
28	Bolivia	0,79	0,11	0,01	0,30	113
29	Paraguay	0,80	0,09	0,02	0,30	114

Source: ITU

6   Future directions for developing the DOI for policy analysis

The Digital Opportunity Index (DOI) could be developed in at least three ways:

1) The Digital Opportunity Index could be further developed as a planning tool to identify the areas most affected by the lack of access to services (in fixed telephony, mobile phone or Internet access) and the benefits that technology brings, within a country.

2) The Digital Opportunity Index could be further developed as a research tool. The DOI is being used especially to measure potential access to communications, but it could be enriched with other measures, including education, for example, which is the sector most benefited with implementation of the technology. As a composite indicator, it is possible to add indicators and combine the DOI with other indicators and/or indices.

3) The DOI could be used to measure economic progress. The DOI could be used to show how a country (or regions within a country) is making progress because of the production of ICTs and the benefits of this economic activity in generating incomes for the economy as a whole.

There is a need for further work to apply this composite indicator around the world and make it more robust and reliable. It would be helpful to overcome the problems of geography or different languages spoke by people that understanding the DOI difficult, by giving out information about ICTs, ICT measurement and analysis and ICT policies and the DOI in different languages.

7 Data availability in Peru

10 of the 11 DOI indicators are available. The only indicator for which figures are not yet widely available is the ratio of broadband mobile subscribers, because the service is not widely implemented yet.

7.1 OPPORTUNITY

- **Percentage of population covered by mobile telephony**

  Definition & source: A proxy indicator is used for this indicator, in the percentage of the urban population divided by the total population. These data come from Census carried out in 2005.

  Method of computation: Urban population in 2005 are divided by the total population and multiplied by 100:

  $$=20/28*100= 72.6\%$$

- **Mobile Cellular tariffs as a percentage of per capita income**

  Definition & Source: The total amount of mobile cellular pre-paid tariff basket low user is divided by 2004 Gross Domestic Product per capita (G.D.P) from National Accounts of Peru. These data come from the administrative records and price information provided by Telefónica del Perú.

  Periodicity of Measurement: Annual.

- **Internet access tariffs as a percentage of per capita income**

  Definition & source: This indicator measures the cost of the cheapest package for 20 hours of Internet access a month (approx. 1 hour per working day) by either dial-up or broadband (whichever is cheapest). For dial-up, the telephone rental charge is not included, by the cost of 20 hours' local calls are taken into account

(including twenty connection fees, assuming that users log on and log off after every hour of use). For broadband, telephone charges are not taken into account. Tariffs come from the price information provided by Telefónica del Perú.

Calculation method: The cost of 20 hours per month Internet access is divided by the monthly Gross Domestic Product (G.D.P) per capita.

Periodicity of Measurement Annual

7.2 INFRASTRUCTURE

- **Proportion of households with a fixed line telephone**

Definition & source: These data refer to the proportion of the total number of households which have a fixed line at home. Data come from the Peruvian National Household Survey, which is addressed to a important sample of the total number of 20,000 households at the national level.

Method of computation: In household surveys, scientific techniques of random sampling are used, using the technical conventional of imputation for the case of non-answer. Expansion factors are derived for statistical methods on the base of the design of the sample.

- **Mobile cellular subscribers per 100 inhabitants**

Definition & source: the number of mobile cellular users who subscribe to an operator which provides access to cellular technology. Data on cellular subscribers are collected through annual questionnaires that the International Telecommunication Union (TCU) sends to regulators, Ministries or National Statistical Offices (depending on the country). The questionnaire is supplemented by annual reports of industry organizations to cross –check accuracy and to obtain data for countries that may not reply to the questionnaire.

Method of computation: Total cellular subscribers are divided by the population and multiplied by 100.

Periodicity of Measurement Annual

There are comparability issues for mobile subscribers, due to the prevalence of pre-paid subscriptions . This arises from differences in the length of time period chosen for determining when a pre-paid subscription is considered no longer active.

- **Proportion of households with Internet access at home**

  Definition & Source : We get the proportion of households with Internet access through the National Household Survey - it reflects the number of households that answered the question on whether they have internet access at home and they answered yes. It is adjusted for non-responses.

  Method of computation

  In household surveys, scientific techniques of random sampling are used, using the technical conventional of imputation for the case of non-answer. Expansion factors are derived for statistical methods on the base of the design of the sample. From the same survey we get three DOI indicators.

- **Mobile Internet subscribers per 100 inhabitants**

  Definition & Source: This Internet subscribers data series refers to users of Internet service who subscribe to an automatic public Internet service that provides access to the public switched internet network. Data on Internet subscribers are collected through annual questionnaires that the International Telecommunication Union (TCU) sends to government telecommunication agencies.

Method of computation Total Internet subscribers are divided by the population and multiplied by 100.

Periodicity of Measurement: Annual.

- **Proportion of household with a computer**

Definition & Source: By definition personal computer (PCs) are computers designed to be operated by a single user at a time. The Census of Resources Informatics was executed at National level after that, the number of PCs is estimated using industry sales data on PC imports data.

Method of computation

The total number of PCs in a country is divided by the population and multiplied by 100.

Periodicity of Measurement: Annual.

7.3 UTILIZATION

- **Proportion of individuals that used the Internet**

Definition: It includes the proportion of individuals that used the Internet (in the last 12 months).

- **Ratio of broadband Internet subscribers to fixed Internet subscribers**

The definition of broadband hinges on speed and mode. There is a growing consensus that a service should be considered broadband only if it offers speeds of at least 2.56 kbit/s at least one direction, however in some cases the service is considered broadband even when they offer speeds less than 256 Kbit/s.

- **Ratio of broadband mobile subscribers to mobile Internet subscribers**

  Definition & Source: Broadband mobile subscribers are defined as mobile subscribers with access to cellular services at speeds of more than 256 kbps. Currently, three standards are recognized by the ITU as being mobile broadband or IMT-2000 compliant: Wideband Code Division Multiple Access (W-CDMA), Code Division Multiple Access (Evolution-Data Only) (CDMA EV-DO) and Time Division – Synchronous Code Division Multiple Access (TD-SCDMA). There are a very few people whose have started to use this kind of service, which is only just starting to become available in Peru, with the launch of Movistar Peru's CDMA 1x EV-DO service in October 2004. Data on the number of subscribers should be available from the operator – however, there is a lack of information with reference to this point.

8 Conclusions

- There is a big gap between access to ICT means between rural and urban areas within Peru.

- The level of indicators is low with regard to the goals established, especially in Internet access at home service.

- The methods of computation have some limitations and require some approximation in Peru.

- Access to ICTs could be improved through better education by making books available online and making government more transparent and reducing corruption.

- Application of the DOI could help improve ICT measurement by making clear the need for better and more standard indicators worldwide, in order to help in policy evaluation and analysis.

9 References:

World Information Society Report 2006, ITU, Geneva.

International Telecommunication Union (ITU), www.itu.int.

Indicators for Monitoring the Millennium Development Goals, United Nations, New York.

Peru Compendio Estadístico 2005, The Government of Peru.

Peruvian National Institute of Statistics and Informatics (various).