DAI – DIGITAL ACCESS INDEX

BRAZIL: 2006 UPDATE

Caio Bonilha
caiobonilha@uol.com.br

I. INTRODUCTION

Since 2003, after ITU had published a study on the Digital Access Index (DAI) of several countries, we are using the same methodology in order to measure digital division among different Brazilian States.

Taking into account the substantial growth of Internet and Cellular markets in the last four years, we present a review of the 2002 study to analyze Brazilian progress in the elapsed period (2002-2006).

II. DATA SOURCES & METHODOLOGY

According to ITU methodology, DAI is composed of five factors that depend on several parameters. In the Brazilian case, some of these parameters are known and available, for others we used our database. Data sources are:

1. **Infrastructure**: we are using fixed and mobile access information from ANATEL (Agência Nacional de Telecommunicacoes from - Dec. 2006) and population update based on IBGE (Instituto Brasileiro de Geografia e Estatistica – PNAD 2005);
2. **Affordability**: we are using price information from ISP's and Telecom Operators. Calculation of Per Capita Income was based on State GNP available on IPIB (Internet Produto Interno Bruto- year 2004 updated to 2006 using IBGE's yearly growth rate) and State updated population;
3. **Knowledge:** we are using literacy and school enrolment information from IBGE's PNAD 2005;
4. **Quality**: we are using information from our database and ISP's;
5. **Usage**: we are extracting Internet usage information from IBOPE – NetRatings (Instituto Brasileiro Opiniao Publica & Estatistica), NIC-CGI (Brazilian Internet committee) and our database.

Each parameter contributes with (up to) 20% (or 0.2) to construct the index.

III. BRAZIL BREAKDOWN

For all Brazilian states, we show in the diagram below the 2006 DAI breakdown values:

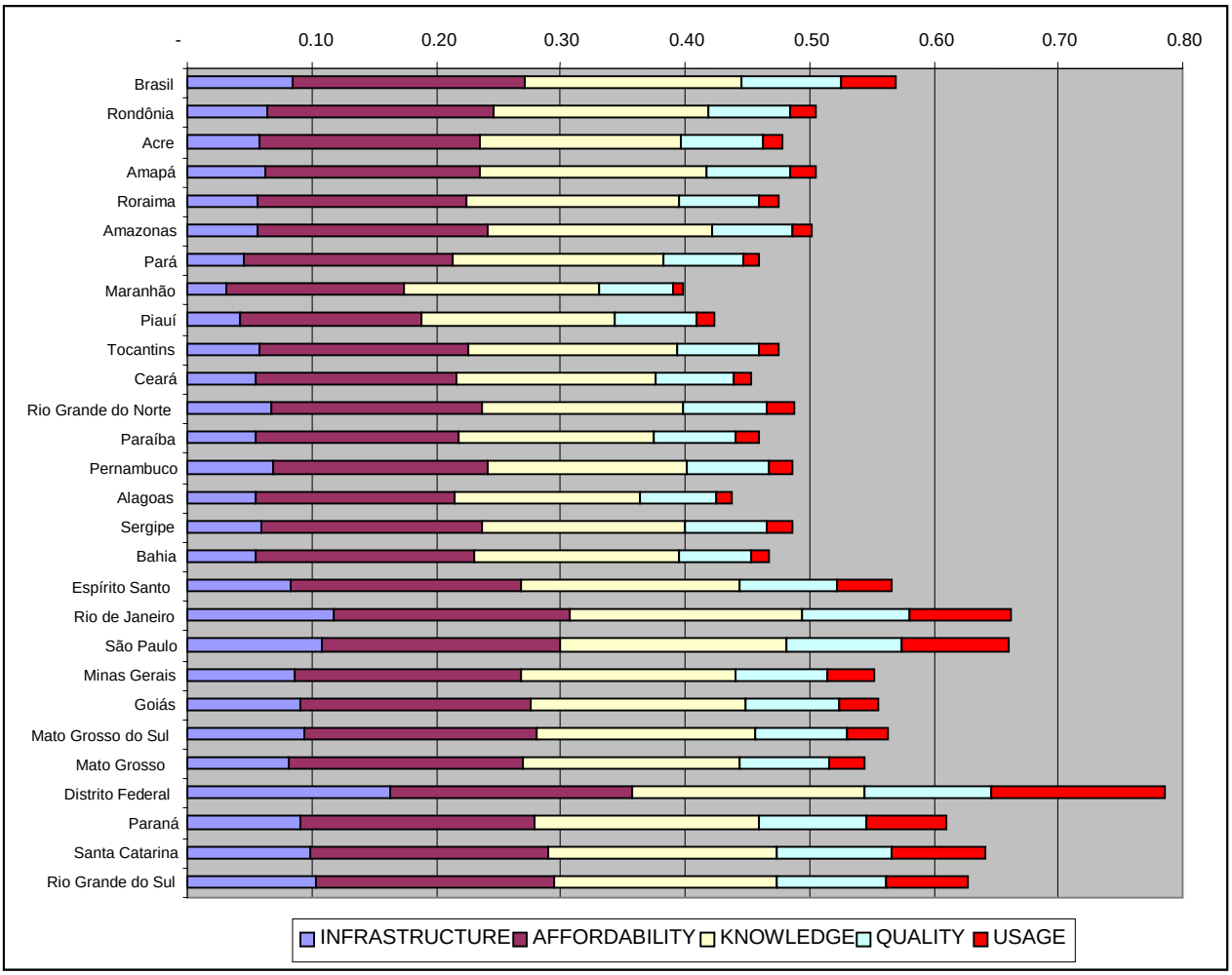

Figure 1: DAI 2006 (Source: Brampton Telecom)

IV. DAI RESULTS

Applying ITU methodology, Brazil's DAI by the end of 2006 reaches 0.57, growing 15.9% from value calculated in 2002. According to ITU criteria, Brazil is in the Upper level (0.5-0.69), which is considered as "have achieved an acceptable level of access for a majority of their inhabitants"[1]. The main factors affecting this growth are:

- *Infrastructure*: overall index almost doubled from 0.05 to 0.09 due to:
  1. Substantial increase of Internet broadband subscribers that went from 635,000 subscribers by Dec 2002 to 5.6 million (Dec 2006), growing 781% and raising subscribers density from 0.32% to 3%.

1 ITU DAI Report, Dec 2003, Chapter 5, Item 5.4.

2. Substantial increase of cellular subscribers, from 34.3 million by Dec 2002 to 100 million (Dec 2006), growing 191% and raising subscribers density from 19.6% to 53.3%, surpassing the POTS density.

- *Usage*: overall value doubled from 0.02 to 0.04 due to substantial increase of Internet users that went from 18.4 million by Dec 2002 to 40.8 million (Dec 2006), growing 121% and raising users density from 10.3% to 21.76%. This growth had several reasons, like coverage, price and state-supported programs that promoted Internet access to low-income population.

In other hand, the decrease of School Enrolment contributed to push down *Knowledge* factor from 0.18 (Dec 2002) to 0.17 (Dec 2006)..

The 2002 study showed Brazil's internal digital divide, as a consequence of inequality among different regions. Fortunately, we can see some progress in order to "close the gap" in some States as showed in the comparative table below.

Source: Brampton	INFRA-STRUCTURE	AFFORD ABILITY	KNOWL EDGE	QUALITY	USAGE	DAI 2006	DAI 2004	DAI 2002	GROWTH(%) 2004-2006	GROWTH (%) 2002-2006
Brasil	**0.09**	**0.19**	**0.17**	**0.08**	**0.04**	**0.57**	**0.53**	**0.49**	**8.0%**	**15.9%**
Rondônia	0.06	0.18	0.17	0.07	0.02	0.50	0.45	0.43	11.1%	18.1%
Acre	0.06	0.18	0.16	0.07	0.02	0.48	0.43	0.39	12.1%	22.7%
Amapá	0.06	0.17	0.18	0.07	0.02	0.50	0.45	0.42	13.3%	19.6%
Roraima	0.06	0.17	0.17	0.06	0.02	0.48	0.43	0.43	9.5%	11.7%
Amazonas	0.06	0.19	0.18	0.06	0.02	0.50	0.45	0.43	10.5%	16.1%
Pará	0.05	0.17	0.17	0.06	0.01	0.46	0.42	0.40	10.8%	14.3%
Maranhão	0.03	0.14	0.16	0.06	0.01	0.40	0.34	0.33	18.2%	20.6%
Piauí	0.04	0.15	0.16	0.06	0.01	0.42	0.35	0.34	21.5%	23.5%
Tocantins	0.06	0.17	0.17	0.07	0.02	0.48	0.42	0.40	14.4%	20.4%
Ceará	0.05	0.16	0.16	0.06	0.01	0.45	0.40	0.39	13.5%	16.5%
Rio Grande do Norte	0.07	0.17	0.16	0.07	0.02	0.49	0.43	0.41	14.7%	19.5%
Paraíba	0.06	0.16	0.16	0.07	0.02	0.46	0.40	0.38	14.5%	19.7%
Pernambuco	0.07	0.17	0.16	0.07	0.02	0.49	0.43	0.42	12.5%	17.3%
Alagoas	0.06	0.16	0.15	0.06	0.01	0.44	0.38	0.37	14.5%	19.6%
Sergipe	0.06	0.18	0.16	0.07	0.02	0.49	0.43	0.42	13.0%	16.1%
Bahia	0.06	0.18	0.16	0.06	0.01	0.47	0.42	0.41	10.3%	14.7%
Espírito Santo	0.08	0.18	0.17	0.08	0.04	0.57	0.52	0.49	9.5%	15.9%
Rio de Janeiro	0.12	0.19	0.19	0.09	0.08	0.66	0.61	0.55	9.1%	20.1%
São Paulo	0.11	0.19	0.18	0.09	0.09	0.66	0.61	0.55	8.2%	19.2%
Minas Gerais	0.09	0.18	0.17	0.07	0.04	0.55	0.51	0.49	8.2%	13.2%
Goiás	0.09	0.18	0.17	0.07	0.03	0.56	0.51	0.47	8.2%	19.2%
Mato Grosso do Sul	0.09	0.19	0.18	0.07	0.03	0.56	0.53	0.48	7.3%	16.4%
Mato Grosso	0.08	0.19	0.17	0.07	0.03	0.54	0.50	0.47	7.9%	16.0%
Distrito Federal	0.16	0.19	0.19	0.10	0.14	0.79	0.71	0.62	11.0%	26.2%
Paraná	0.09	0.19	0.18	0.09	0.06	0.61	0.56	0.51	9.2%	20.9%
Santa Catarina	0.10	0.19	0.18	0.09	0.08	0.64	0.58	0.52	10.2%	22.9%
Rio Grande do Sul	0.10	0.19	0.18	0.09	0.07	0.63	0.58	0.53	7.3%	17.5%

Table 1: DAI – Growth Rate 2002-2004 (Source: Brampton Telecom)

As shown in the table 1, from 2002 to 2006, 22 States reached a growth rate greater than Brazil's growth rate (15.9%). Among these 22 states, 7 (seven) are from North and 6 (six) are from Northeast regions. This in turn shows that, even considering that there regions have a smaller DAI than Brazilian average DAI of 0.57, they are closing the gap.

V. CONCLUSIONS

Results show an internal Brazil's *digital divide* due to two main factors:

1. *High level of wealth concentration*: it is a complex problem that will require a long term solution. Closing the digital divide can help to solve this problem;
2. *Internet Infrastructure concentration*: Taking into account that telecom operators and ISP's are profit organization, they have available infrastructure where is economically feasible. Less than 2,000 of Brazilian 6,500 municipalities have local IP commercial infrastructure.

As a consequence, there is a deadlock that can only be broken with public policies, long-term financial projects and coordination among them. Many efforts that are being developed today could reach more benefits if better coordinated . For example, two of the most important programs to close the digital divide are being developed in São Paulo State, the richest Brazilian State. Another issue is related on FUST[2] resources, which could fuel a national program, with clear objectives, schedules and funding sources with priority to the States that are lagging behind.

Specifically in terms of ITC field, some suggestions can be quickly offered:

1. Coordination: it should be desirable some level of coordination in order to apply existing resources. A national "digital-divide" plan could be a roadmap to guide organisations (public and private);
2. Municipal networks: it is necessary to promote municipal network's development not only with financing, but also with technical support. This development could be fueled with the partnership between public (municipality) and private (network operator);
3. IP Backbone: as we said, less than 40% of Brazilian municipalities have local Internet access mainly due the lack of IP backbone, which is developed in

2 FUST (Telecom Universal Service Fund) charges 1% of net revenue from all telecom operators to be used to deliver services in areas without commercial appeal and "digital divide" programs.

profitable markets. Existing funds could be used to extend these IP backbones to non-profitable regions.

caiobonilha@uol.com.br Brazil