

Estimation and Characterization of the Digital Divide

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Abstract

Currently there is no precise measure of the Digital Divide. Given the complexity and interdisciplinary nature of the problem, it has been difficult to establish a set of parameters that include the major issues affecting the characteristics and evolution of the Digital Divide. Financial and academic agencies in both regional and international scenarios have developed frames of reference and in-depth studies that indicate that information technologies play an important role when applied in the proper context and focus. There are evidences that technology centric approaches do not provide solutions conducive to sustainable development. We believe that the participation of the community and a cohesive and integral plan of action are necessary to fully optimize the potential of information technologies' contribution to social and scientific advancement. We have analysed a series of important reports in search of proposing and identifying the crucial elements conducive to successful application of information technologies to sustainable development. Based on our findings, we propose in this paper the consideration of new parameters of socioeconomic nature to help in the process of quantifying and understanding of the Digital Divide.

The search for indicators to measure the Digital Divide

There have been significant efforts during the last years to define indicators to estimate the Digital Divide among nations, regions and social groups. The first attempts considered mainly parameters of technical nature related with access to computers and internet access. Though these technical parameters give an indication of the magnitude of the Digital Divide, they do not provide a complete picture of its dimension and context. The first wave of projects designed to reduce the Digital Divide focused on the technical nature of the problem. These projects did not produce long term solutions, in fact in some cases the equipment and infrastructure involved were neglected and abandoned. There was a general belief that installing computers and internet access would attract myriads of users looking for the magic of the internet and the appeal of the information technologies arrival in town. Fortunately, this first wave did not last very much because never produced the results originally planned and, more importantly, due to a definite lack of community leadership or minimum participation of the population in the definition of the scope, needs and terms of the projects.

In the second wave of projects, the spectrum of players working toward reducing the Digital Divide increased. The experience of the first wave gave a new impetus to the search for other indicators involved in estimating the Digital Divide. The second wave introduced the notion of the interdisciplinary nature of the problem incorporating to the scene socioeconomic indicators and regulatory factors. In this stage of the evolution of the Digital Divide, the issues of incorporating applications and training were widely considered and supported by financial and academic institutions as well as by equipment and infrastructure providers. But still the reduction of the Digital Divide was not obvious and though we witnessed isolated successful experiences, the goal of connecting information technologies and prosperity was elusive.

During the third wave of projects it was more evident and generally accepted that the Digital Divide was not only of technological but also of human development nature. The missing link that conducted to a great number of successful projects all over the world had been found: grass root participation, community leadership and sustainability factors included in the projects. The connection between technology and human development contributed to better understanding of the Digital Divide. In many parts of the world several communities have experienced the benefits of the third wave and have been able to integrate first, second and third waves in search of higher levels of community prosperity.

Unfortunately, the evolution of the Digital Divide has not been homogeneous in the world, there are countries and regions of the world that still remain in the first or second wave in which governments and equipment vendors emphasize the technical nature of the problem. However, in other countries a fourth wave is emerging as result of applying best practices, integrating socioeconomic development with human values and taking advantage of crosspollination with other successful experiences in different parts of the world.

In the process of advancing from the second to the third wave of the Digital Divide, financial, development, NGO's and governmental agencies produced major publications followed by important initiatives with a clear notion of the interdisciplinary nature of the problem. A sample of indicators defined by a group of such agencies is described as follows:

O E C D Indicators [1]

- ✓ Development of Infrastructure
- ✓ Regulatory initiatives to increase competition in networking service provision
- ✓ Internet access in schools
- ✓ Internet access in public agencies
- ✓ Vocational education and training
- ✓ Support for small businesses in the application and deployment of information and communications technologies (ICT's)
- ✓ Development programs for rural areas
- ✓ On-line governmental services
- ✓ The Government as model for the use of ICT's

Bridges Network Indicators [2]

- ✓ Computer penetration
- ✓ Education and training
- ✓ Condition and distribution of poverty
- ✓ Telecommunications infrastructure
- ✓ Status of ICT service provision in the country
- ✓ Demography (geography, race, gender...etc.)

DOT Force Indicators [3]

- ✓ Teledensity
- ✓ Public telephony penetration
- ✓ Mobile telephony penetration
- ✓ Internet hosts
- ✓ Internet users
- ✓ Computer penetration
- ✓ Telephone service cost as percentage of GDP per capita
- ✓ Telecommunications investment
- ✓ Literacy
- ✓ Education budget as percentage of GDP
- ✓ Health
- ✓ Foreign investment
- ✓ Import/export balance

DOI Indicators [4]

- ✓ Poverty and income
- ✓ Health and mortality rate
- ✓ Education
- ✓ Environmental issues
- ✓ Nutrition indicators
- ✓ Provision of basic resources (water, electricity, etc.)
- ✓ Gender equality

ICNE Indicators [5]

- ✓ Human capital
- ✓ Macroeconomic Indicators
- ✓ Technology innovation
- ✓ Globalization indicators
- ✓ ICT Infrastructure

TELEDDDES Foundation Indicators [6]

- ✓ Equity and justice
- ✓ Trustworthiness and moral leadership
- ✓ Education
- ✓ Governance and community participation
- ✓ Gender equality
- ✓ Socioeconomic development condition
- ✓ Environmental awareness

OECD: Organization for Economic Cooperation and Development

DOT Force: Digital Opportunity Task Force

DOI: Digital Opportunity Initiative

ICNE: Indice Competitivo de la Nueva Economía (in Spanish)

TELEDDDES: Telecomunicaciones para Educación y Desarrollo (in Spanish)

It can be seen from these indicators that there is now a clear interrelatedness between socioeconomic and technological factors that help to better understand and estimate the Digital Divide. There are also more institutions and governments involved, the challenge still consists in connecting research and development in information technologies and telecommunications with the needs of the people of all social strata and its prosperity, exploring new dimensions and paradigms of the Development field.

Conclusions

The path from the first wave to the emerging fourth wave of the Digital Divide has given a more in-depth understanding of its nature, we have learned that the Digital Divide is not only a technological issue, it is a Human Development concern. In order to reduce the Digital Divide it is necessary to acquire a new and more comprehensive vision of Sustainable Development that includes both the moral and intellectual leadership of the individuals and the community.

References

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