

2019

Annual Report Cetic.br



United Nations
Educational, Scientific and
Cultural Organization

cetic.br

Regional Center for Studies on the
Development of the Information
Society under the auspices of UNESCO

nic.br

Brazilian Network
Information Center

cgi.br

Brazilian Internet
Steering Committee

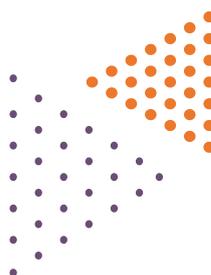
About CGI.br

The Brazilian Internet Steering Committee (CGI.br) was created with the purpose of coordinating and integrating all Internet service initiatives in Brazil, as well as promoting technical quality, innovation and the dissemination of Internet services.



About NIC.br

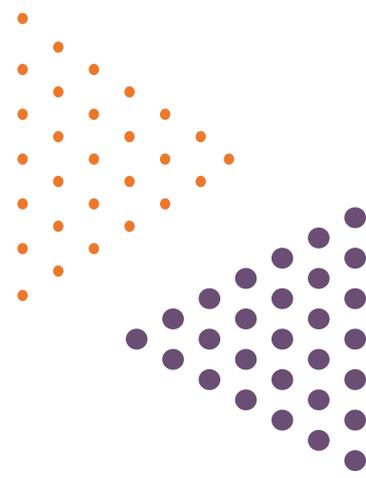
The Brazilian Network Information Center (NIC.br) was created to implement the decisions and projects designed by the Brazilian Internet Steering Committee (CGI.br).



About Cetic.br

The Regional Center for Studies on the Development of the Information Society (Cetic.br) is the NIC.br department responsible for the production of indicators and statistics on the availability and use of the Internet in Brazil. In 2012 Cetic.br was nominated a UNESCO Category II Center with the mission of monitoring the development of knowledge and information societies in Latin America and the Portuguese-speaking countries of Africa.

CREATIVE COMMONS



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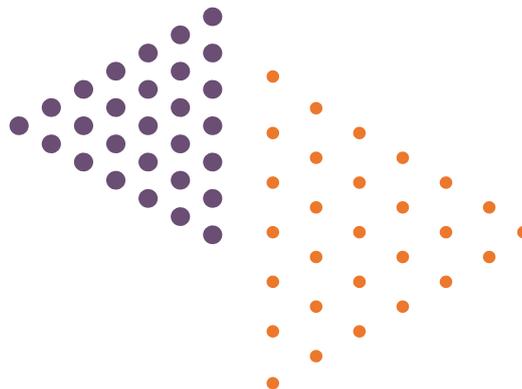
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Presentation

This annual report highlights the key actions and activities of the Regional Center for Studies on the Development of the Information Society (Cetic.br), a center linked to the Brazilian Network Information Center (NIC.br), which operates under the auspices of UNESCO.

In 2019, Cetic.br/NIC.br strengthened its partnership with UNESCO's Information and Communication (IC) Sector. For the eighth year, both organizations worked together on areas at the intersection of society and digital technologies, exploring implications for inclusive knowledge societies. Cetic.br/NIC.br continued its core activities: monitoring the development of information and knowledge societies; producing relevant data and statistics for evidence-based policymaking; promoting informed debate on the role of digital technologies in sustainable development; building capacity in survey methods; and developing methodological guidelines for data production.

Cetic.br/NIC.br is an active strategic partner of UNESCO, not only in the Information and Communication Sector, but also in fields such as education and culture. Over the years, Cetic.br/NIC.br has created synergies that support and facilitate many of UNESCO's action lines, including the measurement of broader UN initiatives such as the Sustainable Development Goals (SDGs) and participation in specific thematic agendas such as the objectives of the World Summit

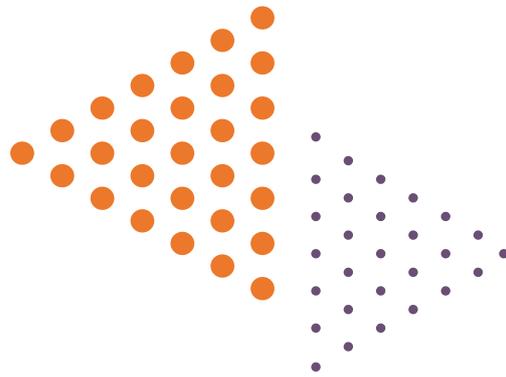
on the Information Society (WSIS) regarding broadband access, ICT in education, health, culture, electronic government, child online protection, etc.

In 2019, Cetic.br/NIC.br concluded the Brazilian implementation of the UNESCO Internet Universality Indicators and presented "Assessing Internet Development in Brazil: Using UNESCO Internet Universality ROAM-X Indicators"¹ at the Internet Governance Forum (IGF) in Berlin.

Held in São Paulo, Brazil, in December 2019, the Regional Forum on Artificial Intelligence in Latin America and the Caribbean² was another major achievement. This prestigious event was organized by UNESCO, Cetic.br/NIC.br, and the Brazilian Government's Ministry of Foreign Affairs (MRE) and Ministry of Science, Technology, Innovation, and Communications (MCTIC). The occasion brought together over 644 key stakeholders from 33 countries to discuss the opportunities and challenges of artificial intelligence from a human rights perspective. Coming after Principles for Artificial Intelligence: Towards a Humanistic Approach, an international conference held in Paris in March of the same year, the forum tied into a series of UNESCO regional events on artificial intelligence. UNESCO's work in this area reflects a growing awareness that artificial intelligence can help address many of humanity's challenges, including those related to education, access to information, knowledge and science, culture, media, gender

¹ Publication available at cetic.br/media/docs/publicacoes/8/20200117094619/Assessing_Internet_Development_in_Brazil.pdf

² en.unesco.org/artificial-intelligence/latin-america-forum



equality, and poverty alleviation. But if we are to reap its benefits, artificial intelligence (AI) must be developed in accordance with universally recognized rights and values.

*Measurement of Digital Health: Methodological Recommendations and Case Studies*³ – a collective work by Cetic.br/NIC.br and the World Health Organization’s regional office in the Americas, the Pan American Health Organization (PAHO) – was also published in 2019. This resource offers practical guidance to countries in the region seeking to measure and track the progress of digital health. The publication addresses a growing need for reliable data and indicators to help governments develop and monitor ICT policies and strategies, make cross-national comparisons, and adopt solutions for meaningful egalitarian use of technologies in the health sector.

Cetic.br/NIC.br and the UNESCO Institute for Statistics (UIS), together with a group of ICT and education experts from various regions worldwide, concluded the edition of the *Practical Guide to Implement Surveys on ICT Use in Primary and Secondary Schools*. The guide, an illustration of how to plan, design, and implement surveys that produce relevant, robust, reliable indicators related to the use of information and communication technologies (ICT) in education, will be launched in the second quarter of 2020. It will be a useful reference for government agencies interested in measuring ICT use in education as well as for researchers and other key stakeholders in the

field. Cetic.br/NIC.br also participated actively in UNICEF’s Global Kids Online Comparative Report⁴, a document exploring differences and similarities in children’s Internet use across a range of countries and regional contexts.

In 2019, Cetic.br/NIC.br renewed its commitment to supporting capacity-building through regional workshops on survey methodologies and a Massive Open Online Course (MOOC): Tech for Good: The Role of ICT in Achieving the SDGs, produced by UNESCO and Cetic.br/NIC.br in partnership with the SDG Academy. Cetic.br/NIC.br demonstrated, once again, its ability to positively influence public policy in the field of ICT through meaningful debate among key stakeholders and groups of experts, another significant contribution to Brazilian policymakers and international organizations.

Finally, digital transformation and mass adoption of disruptive digital technologies such as AI, Internet of Things (IoT), cloud computing, and robotics have significantly impacted society. It goes without saying that these new technologies will need to be monitored. Cetic.br/NIC.br is a world-renowned reference for best practices in the production of ICT indicators, and their mission, which is the production of quality data on a regular basis that can be compared internationally, will undoubtedly continue to play a vital role in policymaking.

Demi Getschko - CEO
Brazilian Network Information Center (NIC.br)



³ Publication available at <https://www.cetic.br/media/docs/publicacoes/1/measureme%20of%20digital%20health.pdf>

⁴ For more information, please visit <https://www.unicef-irc.org/publications/1059-global-kids-online-comparative-report.html>



Introduction

The need for high-quality, policy-relevant data and statistics goes hand in hand with the digital era. Indeed, the regular production of data and statistics is crucial to sound decision-making, tracking government actions and policies, and measuring the impact of digital transformation on society.

Businesses, governments, and individuals are increasingly adopting digital technologies such as artificial intelligence (AI), robotics, the Internet of Things (IoT), and cloud computing. And digitalization, which is occurring at unprecedented speed and scale⁵, is bringing about new challenges and opportunities. Characterized by the ever-growing penetration of technology in society, digital transformation has enabled consolidation in the Internet economy.

Digital technologies are at the epicenter of this transformation. They have disrupted society as we know it, spurring profound economic change. While the potential of digital technologies for fostering sustainable development is now widely recognized, evidence-based policy has not kept pace with the new reality. This gap, which continues to grow, along with an increase in digitally intensive businesses, is due in part to lack of policy-relevant data.

In an ever-changing technological world, countries must conduct research and carry out national surveys to measure and produce policy-relevant, timely data and statistics. Key elements for consideration include AI; big data; IoT; robotics; blockchain; digital and AI-related skills and the future of jobs; digital innovation and value creation; trust in the digital environment (e.g., security, privacy and data protection); and cross-border data flow.

This new environment calls for sound measurement frameworks that not only respect internationally agreed-upon concepts, definitions, indicators, and metrics, but are also usable for emerging sources such as big data. Moreover, new data sources offer opportunities and challenges that both data producers and statistics users must be aware of.

The Regional Center for Studies on the Development of the Information Society (Cetic.br) has actively participated in the international debate on frameworks for measuring various dimensions of digital transformation and the digital economy. In 2019, Cetic.br/NIC.br supported ongoing international efforts to revise existing frameworks and discuss and propose new ones. It explored the use of new sources for the production of statistics that support policymaking and decision making. Per its mission responsibilities, Cetic.br/NIC.br provided capacity-building programs and methodological support to countries at the regional level.

Mission

Cetic.br/NIC.br's mission is to "contribute to building inclusive knowledge societies through information and communication technologies" in Latin America and Portuguese-speaking countries in Africa. The Center, which is responsible for the periodic production of indicators and statistics on the availability of ICT in Brazil, also conducts training programs in research methodologies in the regions in which it operates.

(Source: Cetic.br, 2020)⁶

Working Together to Foster Innovation in Measuring the Digital Transformation

As a reference center for ICT data and statistics production, Cetic.br/NIC.br constantly seeks innovative solutions for data production, exploring new tools for data collection, analysis, and sharing. In 2019, Cetic.br/NIC.br carried out a series of projects to enhance reliable data production on Internet adoption and promote capacity-building activities to foster sustainable development and

⁵ *Digital Economy Report 2019*. Geneva: UNCTAD

⁶ www.cetic.br/en/sobre

the measurement of digital transformation and the digital economy. Building on its solid experience, the Center continued to carry out nationwide surveys, qualitative and quantitative research, and sectoral studies to produce reliable data and ICT statistics. The Center's national sector-specific surveys enable the design, implementation, and monitoring of ICT public policies throughout Brazilian society.

A knowledge repository

In 2019, Cetic.br/NIC.br published six surveys containing articles and data analyses: ICT Households, ICT in Education, ICT Kids Online Brazil, ICT in Health, ICT in Culture, and ICT Providers. The report *Digital Inequalities in the Urban Space: A Study on Internet Access and Use in the city of São Paulo* was published as part of NIC.br's Sectoral Studies series. Four editions of the Internet Sectoral Overview Report were also published; they focused on the following topics: *Mobile Digital Practices of Older People in Brazil*; *Privacy and Personal Data*; *Digital Collections*; and *The Stunning Growth of E-waste Volume and Its Global Implications*. A special report, *Assessing Internet Development in Brazil: Using UNESCO's Internet Universality ROAM-X Indicators*, was launched at the Internet Governance Forum (IGF 2019) held in Berlin. And a policy paper, *ICT for Sustainable Development: Recommendations for public policies that guarantee rights*, was co-authored with UNESCO. Finally, Cetic.br/NIC.br translated UNESCO material that was available only in English into Portuguese and Spanish.

(Source: Cetic.br, 2020)

The latest edition of the ICT Enterprises survey, which has been carried out since 2005 by Cetic.br/NIC.br, incorporated new measurements based on revisions made to Eurostat's 2018 survey. The Brazilian survey now includes a module on new technologies – such as robotics, cloud services, big data,

and 3D printing – that have a major impact on the economy. It collects relevant data on how Brazilian companies are tapping into new opportunities.

Cetic.br/NIC.br also explored new tools for data collection and sharing and using new sources such as big data to complement traditional data in the production of public statistics. The recently created Laboratory of Methodological Innovation sought to leverage new data collection methods and the provision of online microdata to foster end-to-end innovation in data production. Great emphasis was put on the revision of existing processes and on building capacity in data science and analytics, reinforcing the Center's commitment to disseminating information and knowledge and expanding the reach of its survey methodologies and results.

In 2019, Cetic.br/NIC.br continued its active participation in the debate on information society and digital economy measurement. Forums hosted by the International Telecommunication Union (ITU), the United Nations Economic Commission for Latin America and the Caribbean (UNECLAC), the Organisation for Economic Co-operation and Development (OECD), the United Nations Conference on Trade and Development (UNCTAD), and the United Nations Educational, Scientific and Cultural Organization (UNESCO) were ideal settings for discussing these issues.

Cooperation, a key success factor for data production

All of Cetic.br/NIC.br's ICT surveys and research rely on the methodological support of renowned experts from academia, government, the private sector, and international and civil society organizations. They validate indicators and data collection instruments, and provide guidelines for data analysis. These experts play a crucial role in identifying new areas of investigation, improving methodological procedures, and obtaining reliable data. Cetic.br/NIC.br held seven expert group meetings in 2019, bringing together over 240 experts from various sectors.

Partnerships with relevant data producers are also critical to the Center's activities. Cetic.br/NIC.br currently collaborates with the Brazilian Institute of Geography and Statistics (IBGE), and international organizations such as ITU, UNESCO, and UNECLAC. The Center remains on the cutting edge and adopts best

practices for the production of internationally comparable data. The partnership with UNESCO to create the Internet Universality Indicators and the ROAM-X Framework and, later on, conduct the pilot to measure Internet development in Brazil is but one example that yielded fruitful results.

Cooperation, a key success factor for producing methodological frameworks

The Internet Universality ROAM-X indicators were designed to enable stakeholders to assess Internet development at the country level and offer policy improvement recommendations, all in accordance with UNESCO's ROAM-X principles: R – Human Rights; O – Openness; A – Accessibility to All, and M – Multistakeholder Participation.

Brazil was the first country to complete an assessment based on the ROAM-X indicators. Cetic.br/NIC.br prepared the national assessment report launched at a UNESCO-led event. Held in Berlin in November 2019, UNESCO's pre-event session at the Internet Governance Forum (IGF) brought together teams of stakeholders from 16 countries spanning five continents to share information. Initiatives from Benin, Brazil, Bulgaria, Ecuador, France, Ghana, Kenya, Nepal, Paraguay, Senegal, Serbia, South Korea, Sudan, Thailand, Tunisia, and Uruguay were presented. Cetic.br/NIC.br presented the key findings of Brazil's report at the pre-event. Other participants included the German Commission for UNESCO, the Council of Europe, the Organisation for Economic Co-operation and Development (OECD), the Association for Progressive Communications (APC), the Internet Society (ISOC), the Internet Corporation for Assigned Names and Numbers (ICANN), Cetic.br/NIC.br, Missions Publiques, the Global Network Initiative (GNI), and the Global Forum for Media Development (GFMD).

(Source: UNESCO, 2019)⁷

The use of big data sources and web scraping techniques to produce ICT data is at the core of certain partnerships. And the work done together by Cetic.br/NIC.br, UNECLAC, and IBGE is another good example of cooperation for digital economy measurement based on big data sources. These three organizations seek to deepen their knowledge of the dynamics of Internet companies and

quantify their impact on the economy to generate information for the design of public policies. Not only is the conceptual and methodological framework discussed, but also how to combine web and administrative data to produce indicators. This cooperation is expected to produce robust methodologies for combined data sources that could be disseminated to countries in the region.

⁷ en.unesco.org/news/igf-2019-witnessed-16-countries-progress-applying-unescos-internet-universality-indicators

Capacity-Building Activities to Meet Data Needs for Policymaking

In 2019, Cetic.br/NIC.br continued to offer workshops with a focus on policymaking to data user communities in Brazil, Latin America, and Portuguese-speaking Africa. These workshops covered theoretical and practical survey methodology concepts, including data collection and data analysis techniques. They also fostered discussion, allowing ICT data users and producers to share information. Designed to promote capacity-building, the 9th NIC.br Annual Workshop on Survey Methodology is noteworthy. “Data for public statistics: Data science, big data and artificial intelligence” was the featured topic.⁸ For the first time, the event was jointly organized by Cetic.br/NIC.br and the National School of Statistical Science (ENCE), which is affiliated with IBGE. The workshop highlighted the importance of new data sources for producing public statistics, and the need for rigorous data production methods and use.

Other thematic workshops in the fields of ICT in health and ICT in education were organized at the regional level. Cetic.br/NIC.br and the World Health Organization’s regional office for the Americas, the Pan American Health Organization (PAHO), published a useful guide titled *Measurement of Digital Health: Methodological Recommendations and Case Studies*. And Cetic.br/NIC.br and the UNESCO Institute for Statistics (UIS) concluded the *Practical Guide to Implement Surveys on ICT Use in Primary and Secondary Schools*, an important resource for policymakers, school managers, educators, and other key stakeholders. Cetic.br/NIC.br also cooperated with the ITU, delivering methodological content on access to and

use of ICT by households and individuals at two workshops held in Luanda (Angola) and Mexico City.

Launched in 2018, the Massive Open Online Course (MOOC): Tech for Good: The Role of ICT in Achieving the SDGs,⁹ which was developed by Cetic.br/NIC.br in partnership with UNESCO and the SDG Academy, was offered twice in 2019 to 1,885 enrolled participants. This 10-week course discusses how information and communication technologies (ICT) – and, notably, the Internet – are crucial to achieving the SDGs. It highlights the rapid and dynamic growth of the Internet, big data, mobile phone usage, artificial intelligence, and other recent trends, exploring opportunities and challenges concerning ICT and the SDGs.

Emerging technologies such as AI have come with profound social and economic change. Artificial intelligence can be an effective instrument for achieving the UN Sustainable Development Goals (SDGs), developing knowledge societies and strengthening the digital economy. If developed in accordance with ethical norms anchored in human values, AI offers many opportunities and could play a key role in promoting social good. It could, consequently, contribute to accelerating human progress, reducing poverty, and addressing critical social issues related to education, health, safety, etc. Given the importance of artificial intelligence and the challenges of measuring its implications for society, Cetic.br/NIC.br hosted the UNESCO Regional Forum on Artificial Intelligence in Latin America and the Caribbean. The event was intended to raise awareness and promote debate about the opportunities and challenges that artificial intelligence and its related technologies pose to societies, governments, organizations, and citizens. The conference also explored artificial

⁸ workshop.metodologia.cetic.br

⁹ www.edx.org/course/tech-for-good-the-role-of-ict-in-achieving-the-sdg

intelligence's potential role for meeting the SDGs, particularly as regards UNESCO's contribution

to the wider UN and social ecosystem.

Artificial intelligence: toward a humanistic approach – UNESCO regional forum on AI in Latin America and the Caribbean

Held in São Paulo, Brazil on December 12 and 13, 2019, this regional forum was organized by UNESCO, Cetic.br/NIC.br, and the Brazilian Government's Ministry of Foreign Affairs (MRE) and Ministry of Science, Technology, Innovation, and Communications (MCTIC), with the support of the University of São Paulo (USP) and Microsoft. The forum brought together more than 644 key stakeholders from 33 countries to discuss opportunities and challenges posed by artificial intelligence from a human rights perspective.

The Regional Forum was part of a series of UNESCO events on artificial intelligence. It followed the Forum on Artificial Intelligence in Africa held in Benguéir, Morocco, in December 2018; Principles for Artificial Intelligence: Toward a Humanistic Approach a global conference held in Paris in March 2019; and the International Conference on Artificial Intelligence and Education held in Beijing in May of the same year.

(Source: UNESCO, 2019)¹⁰

Finally, in addition to participating in international conferences, symposia, seminars and technical forums and discussing methodologies and indicators for measuring the digital economy, Cetic.br/NIC.br also organized public debates in Brazil. It brought together key stakeholders on themes such as education, health, culture, big data, and the digital economy, fostering meaningful dialogue.



¹⁰ en.unesco.org/artificial-intelligence/latin-america-forum



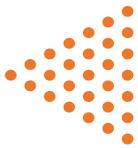
2019 Facts & Figures

19

Publication of ICT surveys,
NIC.br Sectoral Studies &
Internet Sectoral Overview

63.825

Interviews carried out in all of
the Cetic.br/NIC.br surveys



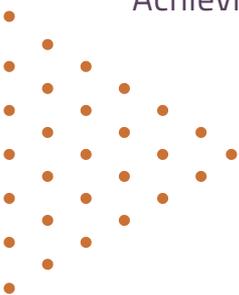
240

External experts involved in
all ICT survey projects

+1.855

PARTICIPANTS

Massive Open Online Course (MOOC:
Tech for Good: The role of ICT in
Achieving the SDGs – edX Platform)



+175

PARTICIPANTS

Capacity-building
workshop on research
methodologies

279

Field interviewers involved
in data collection

25

Field coordination
supervisors



788

Indicators published

7

Expert meetings
(multistakeholder groups)

967

Media appearances



2

New cooperation
agreements signed in 2019

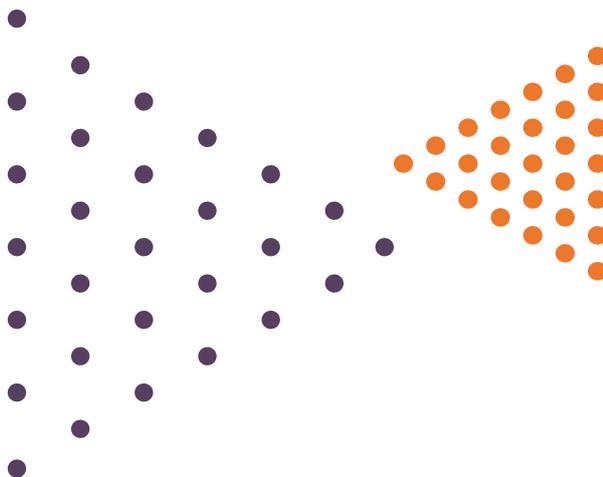
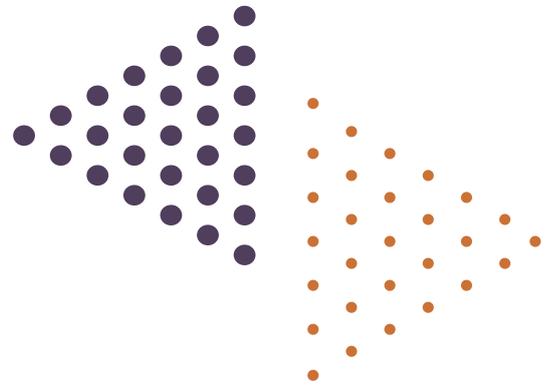
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Number of cooperation
agreements in force

About Cetic.br

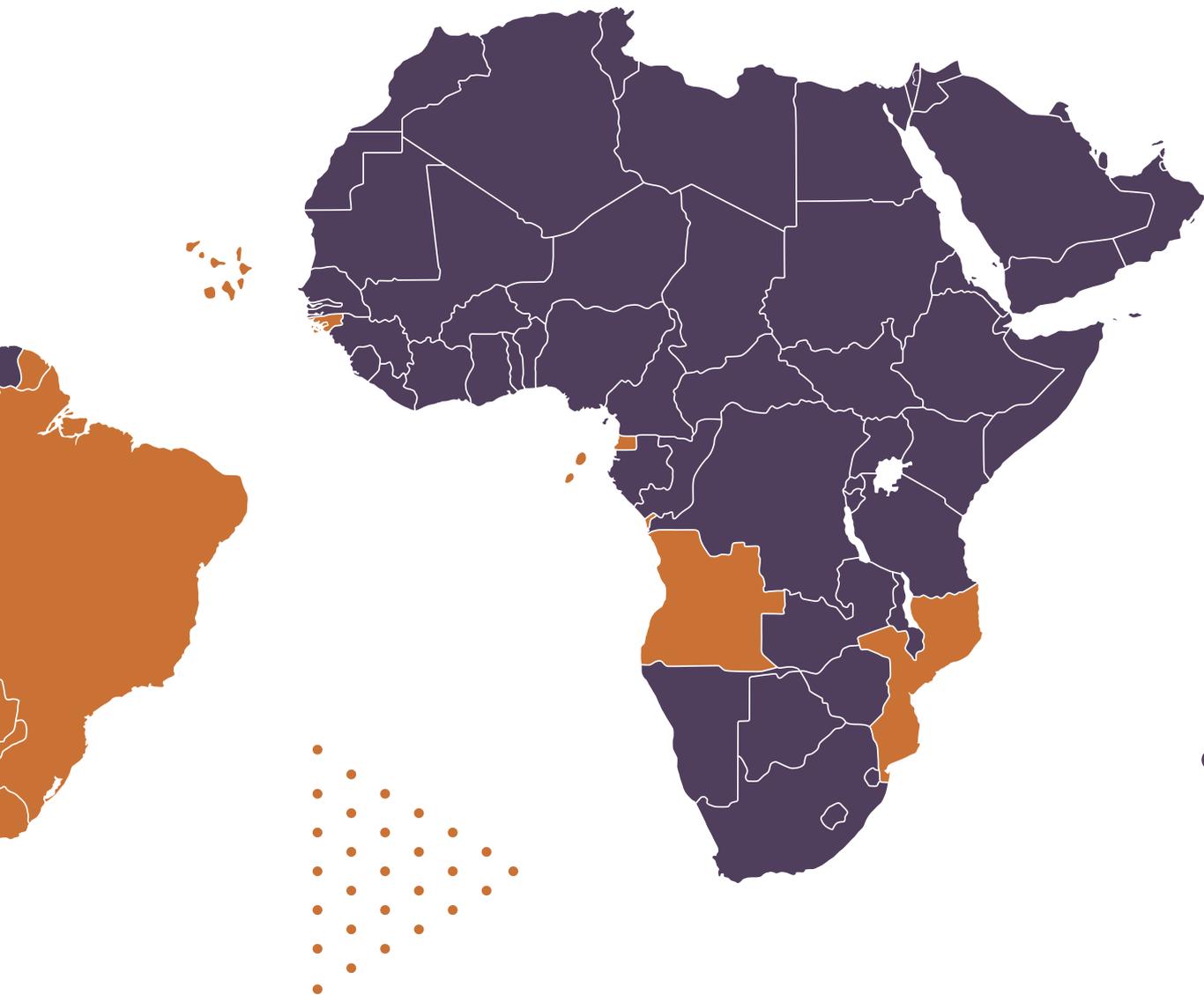
The Regional Center for Studies on the Development of the Information Society (Cetic.br), a department of the Brazilian Network Information Center (NIC.br) associated with the Brazilian Internet Steering Committee (CGI.br), was created in 2005 with the mission of producing data on access to information and communication technologies (ICT) and their use and appropriation in Brazilian society. The data collected is used in the design and monitoring of public policies that contribute to the development of the Internet, supporting digital transformation.

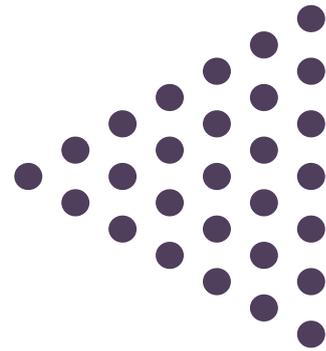
In 2012, Cetic.br/NIC.br became a UNESCO Category 2 Center, the first of its kind dedicated to the development of information and knowledge societies. The Center reports to the Communication and Information (CI) Sector, one of five areas covered by UNESCO. It contributes to the Organization's strategic objectives, strengthening its efforts to monitor the building of information and knowledge societies. Cetic.br/NIC.br cooperates with countries in Latin America and Portuguese-speaking countries in Africa.



UNESCO Category 2 Centers constitute an important mechanism for achieving the objectives outlined in the Organization's five fields of competence. They have the potential to create synergies that can support and facilitate many of UNESCO's lines of action, including those related to the UN's broader initiatives such as the Sustainable Development Goals (SDGs) and specific thematic agendas such as the World Summit on the Information Society (WSIS). Category 2 Centers bring expertise and knowledge to the Organization, making a valuable, unique contribution to the implementation of UNESCO's strategic objectives. Offering context-specific opportunities that can be explored and universalized, they effectively contribute to UNESCO's strategic objectives."

Alexandre Barbosa – Head of the Regional Centre for Studies on the Development of the Information Society (Cetic.br)





Main Lines of Action of Cetic.br

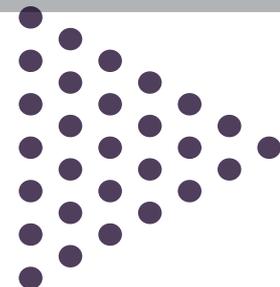
Cetic.br/NIC.br strives to contribute to discussions about the role of ICT data for public policy. It creates opportunities for key stakeholders to share their findings on the intersection between society and digital technologies and implications for the building of information and knowledge societies.

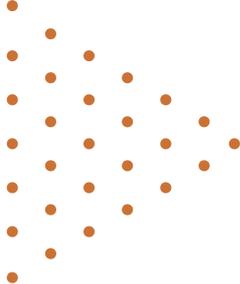
Capacity-Building Programs for Survey Methodologies

This line of action focuses on survey methodology capacity-building programs for the production of ICT-related statistics and indicators. These programs aim to improve the availability and quality of ICT statistics and foster the production of internationally comparable data on access to and use of the digital technologies. This line of action is also intended to raise awareness about the role of data in evidence-based policymaking for developing information and knowledge societies.

Knowledge Center

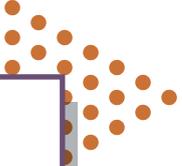
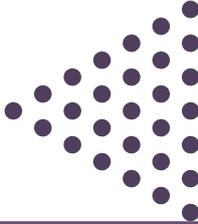
Cetic.br/NIC.br aims to produce data through quantitative and qualitative research on ICT and to disseminate information and knowledge, including survey methodologies, indicators, data analyses, and ICT publications that contribute to the building of inclusive information and knowledge societies.





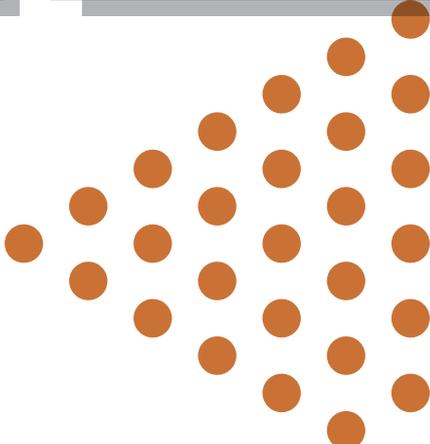
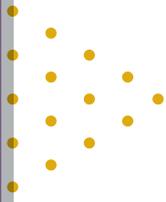
Laboratory of Ideas

Cetic.br/NIC.br also serves as a multistakeholder platform for experience sharing on survey methodologies. It encourages debate among key stakeholders about the challenges inherent in measuring ICT and about emerging issues related to knowledge societies. Cetic.br/NIC.br promotes public debate, lectures, and discussion panels among renowned experts from government, academia, international organizations, and civil society with a view to exploring the socioeconomic implications of ICT. The Laboratory of Ideas guarantees transparency and legitimizes the Center's work.



Culture and Ethics on the Internet

The social dimension of the Internet has drawn attention to topics such as culture and ethics. The Center not only produces data on ethics and the Internet, privacy and online safety, it also engages in workshops and the production of guidelines to raise awareness about these issues among parents, educators, and users in general. The ICT in Culture survey also reinforces the Center's commitment to studying the intersection between the Internet and culture.



▶ Toward a New ICT Data Production Ecosystem: Trusted Data Sharing

Countries are under increasing pressure to produce high-quality data in a timely manner to monitor national digital transformation policies and progress toward sustainable development goals. Enormous amounts of data that are available at ever-increasing rates, new data sources, and institutional arrangements have reshaped the production of ICT data and statistics. Big data, along with traditional sources such as administrative and survey data, has emerged as a promising paradigm, shedding light on private data sources and adding complexity to the ICT data ecosystem.

A wide range of data providers must work in collaboration to produce relevant data for monitoring progress towards the Sustainable Development Goals (SDGs). And traditional national statistical agencies may not be able to provide timely, reliable, and well-disaggregated data that meet policy design and monitoring needs. Cetic.br/NIC.br has developed a new layered model for ICT data production (see Figure 1) that brings new data providers and data sharing opportunities to the existing ecosystem.

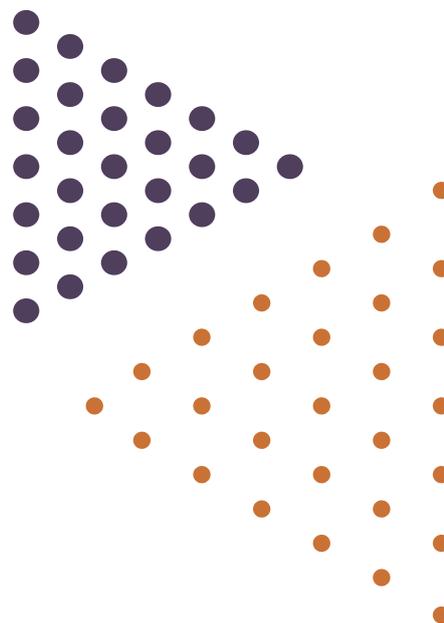
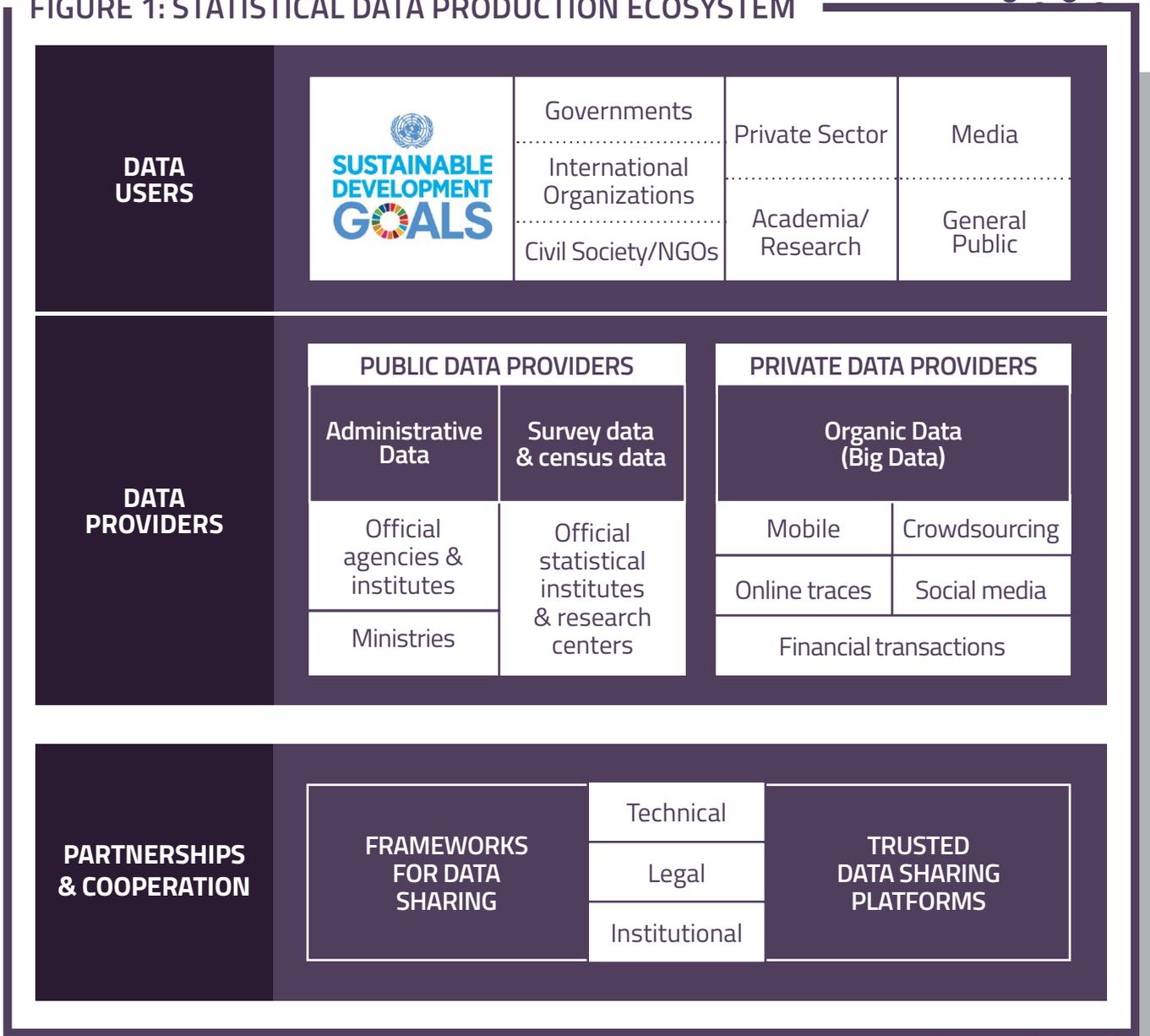


FIGURE 1: STATISTICAL DATA PRODUCTION ECOSYSTEM



Source: Cetic.br

The top layer consists of data users and their specific needs. Statistical data is useful to all stakeholders (governments & policymakers, international organizations, civil society organizations, the private sector, academia, the media, and the general public) and will contribute to the design of new policies and products, to conveying messages for raising awareness, and to producing studies and academic research.

The middle layer consists of traditional national statistical systems and administrative data from governments (Public Data Providers) and a wide range of new private-sector data sources (Private Data Providers).

The bottom layer represents a new data-sharing opportunity through partnerships supported by trusted data platforms and agreements. These platforms aim to mitigate challenges faced by data producers using privately-owned data sets, enabling secure use in a trustworthy manner in compliance with personal data protection regulations. The *trusted data collaboratives* concept was adopted by the United Nations Statistical Division (UNSD) in 2017, at the 4th International Conference on Big Data for Official Statistics.¹¹ It addresses the use of big data and its integration with other sources, e.g., administrative data, geospatial data, and traditional survey and census data.

The diversity of relevant stakeholders – from the public and private sectors – with high potential for production of ICT data and statistics will require the development of appropriate technical, legal, and institutional frameworks. Public and private data providers will need to conduct technical and commercial negotiations to enable data sharing.

Interacting directly with various data users, Cetic.br/NIC.br plays a key role in the new ecosystem and in identifying new ICT data needs. The Center also has close ties with national statistical offices and other data-producing institutions in Latin America and Portuguese-speaking countries.

In Brazil, Cetic.br/NIC.br works in close collaboration with the National Telecommunications Agency (Anatel), the national regulatory agency; the Brazilian Institute of Geography and Statistics (IBGE), the national statistical office; the Ministry of Science, Technology, Innovation and Communications (MCTIC); and other relevant ministries in areas such as education, health, and culture. Besides cooperating with different levels of government, Cetic.br/NIC.br also works with academia, international organizations, and civil society organizations, and is able to produce sound, up-to-date data for policymaking and research.

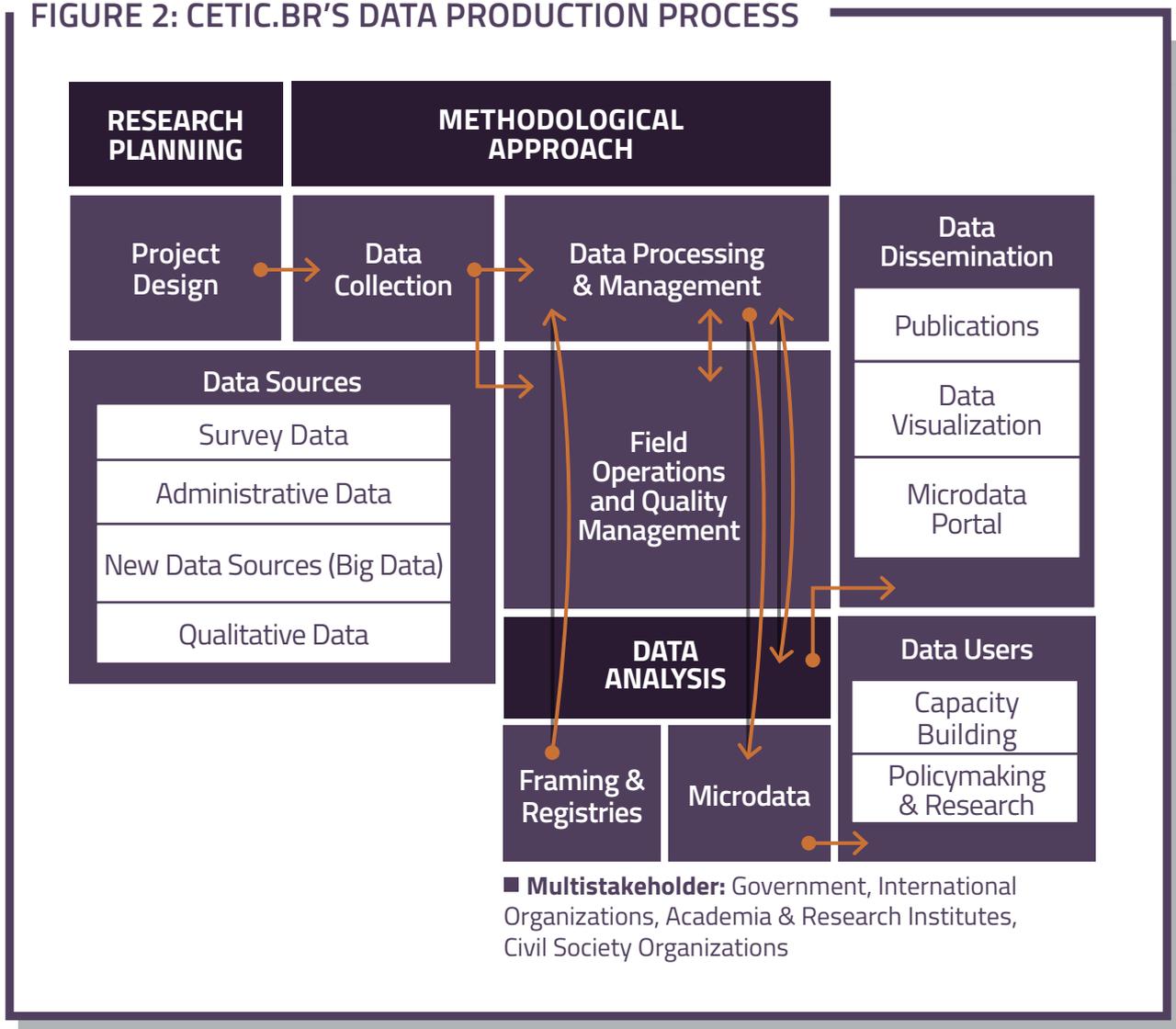
▷ Data Production at Cetic.br/NIC.br

Cetic.br/NIC.br's data production process is based on best practices outlined by national centers of excellence and by international statistical quality assurance frameworks. The Center has developed an end-to-end quality approach that includes every phase of the process, from planning to dissemination. Cetic.br/NIC.br is a world-renowned reference for ICT data production. Its work is supported by a multistakeholder group of experts whose invaluable contributions during the planning and data analysis stages provide legitimacy and enhance transparency.

Data production macro phases are summarized in Figure 2. Cetic.br/NIC.br has optimized resources and fostered innovation, strengthening links between data users and producers. The process involves an approach that engages stakeholders from various sectors throughout the critical phases. Experts participate in the planning phase, defining methodological approaches and indicators, and in the data analysis phase of the data production process. Methodological rigor and transparency are positively correlated with quality data production.

¹¹ This Conference took place in Bogota, Colombia in November 2017. (unstats.un.org/unsd/bigdata/conferences/2017/default.asp)

FIGURE 2: CETIC.BR'S DATA PRODUCTION PROCESS



Cetic.br/NIC.br's methodological approach spans all phases of every research and survey project, from planning to data analysis and sharing. It guides decisions on quantitative and qualitative methodological strategies, framing, sample design and selection, data collection tools, questionnaire design and testing, and field control.

A summary of data types and collection strategies is shown in Table 1. The probability sample design and selection for all quantitative survey projects rely on data sources from official registries that represent the populations of interest.

Cetic.br/NIC.br's surveys are designed to guarantee uniform data collection and an understanding of concepts across interviewers, interviewees, and field supervisors. Guidelines, content, and methodological definitions are thus crucial to the training of field staff. Research teams monitor each data collection step. Quality control guides every action, ensuring accurate results.

Alternative data sources such as big data and administrative data are increasingly being used to complement traditional survey data in the production of public statistics. Unstructured data such as data extracted by web scraping tools is also being incorporated in the process.

TABLE 1 - METHODOLOGICAL APPROACH & DATA COLLECTION STRATEGIES

APPROACH	QUANTITATIVE		QUALITATIVE
	STRUCTURED <i>(Designed Data)</i>	UNSTRUCTURED <i>(Organic Data)</i>	
TYPE OF DATA	Probabilistic survey data National census data Administrative records	Big Data Sensor & Transaction data Web Data	Convenience sample <i>(qualitative data)</i>
DATA COLLECTION STRATEGIES	Structured interview* Secondary data use <i>(data sharing agreements)</i>	Data analytics tools Web Scraping	Cognitive interviews Focus Groups In-depth interviews Case studies

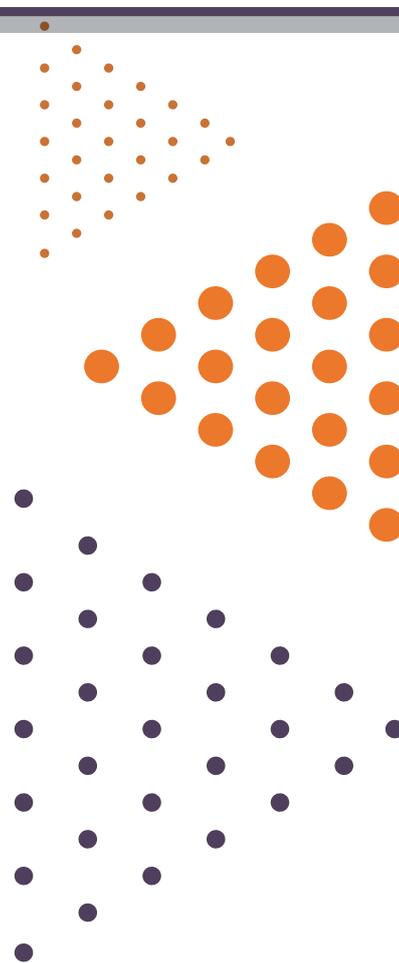
***TYPES OF INTERVIEWS BEING CARRIED OUT BY CETIC.BR:**

CAPI: Computer-assisted personal interviewing;
CATI: Computer-assisted telephone interviewing;

CASI: Computer-assisted self-interviewing;
CAWI: Computer-assisted Web interviewing;

Cetic.br/NIC.br increasingly uses case studies, focus groups, and in-depth interviews for qualitative studies of how digital technologies impact society.

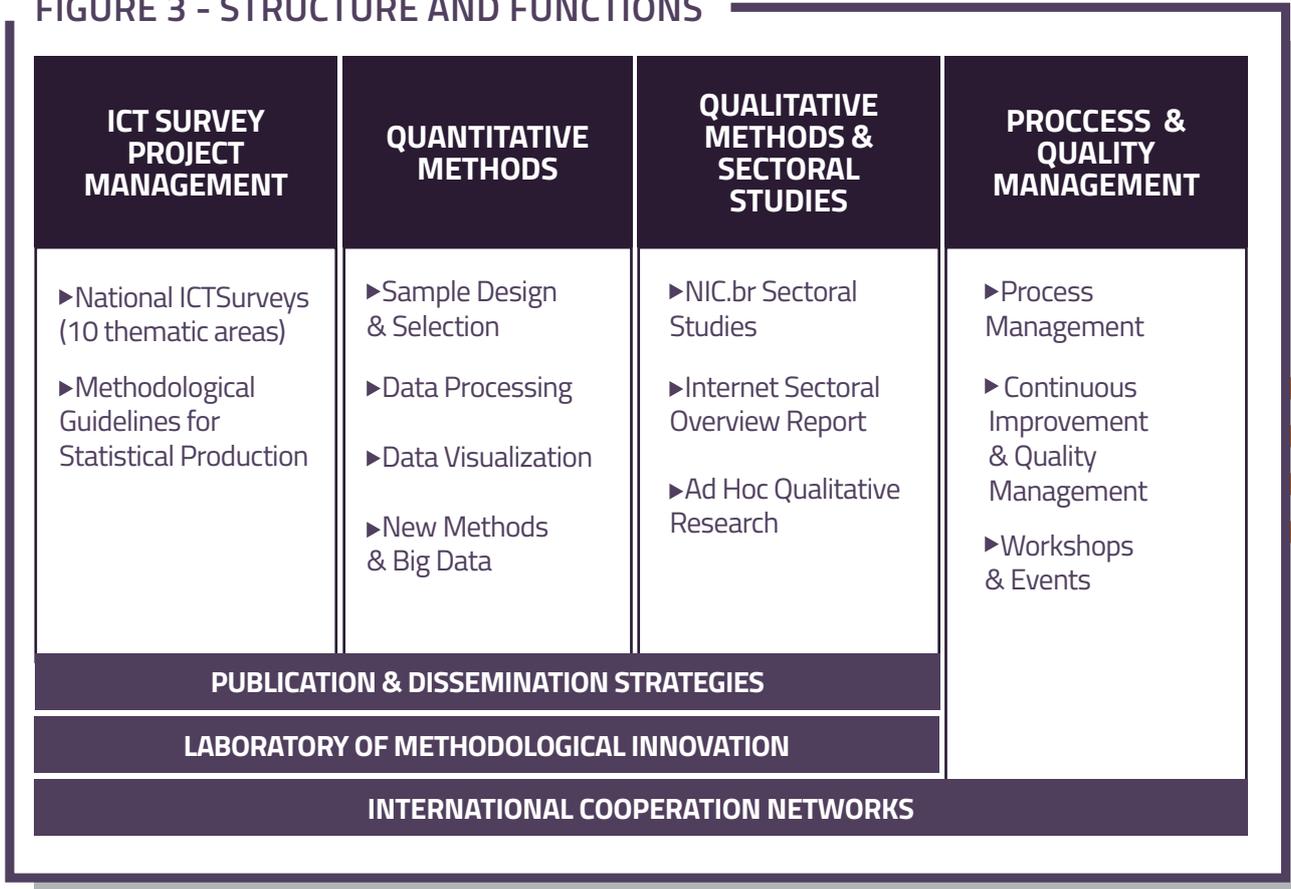
Data dissemination and capacity-building programs are two important elements of Cetic.br/NIC.br's data production process: i) Cetic.br/NIC.br regularly publishes reports on the ICT survey projects, offers a data visualization portal, and provides microdata to policymakers and researchers; ii) Cetic.br/NIC.br offers capacity-building programs on quantitative and qualitative methodologies used for the production ICT-related statistics. These programs address theoretical and practical concepts, stimulating debate and discussion among researchers, policymakers, and representatives from the private sector, civil society, and international organizations.



▷ Structure and Functions

As shown in Figure 3, Cetic.br/NIC.br's structure includes four areas: ICT Survey Project Management; Quantitative Methods; Qualitative Methods and Sectoral Studies; and Process and Quality Management.

FIGURE 3 - STRUCTURE AND FUNCTIONS



Under this structure, Cetic.br/NIC.br publishes periodic demand-side ICT data based on stand-alone surveys (households, businesses, e-government, schools, healthcare facilities, cultural institutions

and non-profit organizations) and sectoral studies on ICT and the Internet. It also looks at supply-side indicators, such as through a nationwide survey on Internet Service Providers (ISPs).

Public Debates on Socioeconomic & Cultural Implications of Digital Technologies

Cetic.br/NIC.br sponsors widespread public debates and technical meetings with key stakeholders from the government, academia, the private sector, and international and civil society organizations to discuss the socioeconomic and cultural implications of digital technologies in society and the building of information and knowledge societies. Debates are based on an interdisciplinary approach to discussing the multifaceted aspects related to the access, use and appropriation of technologies by different segments of society.

During 2019, the Center held public events that marked the launch of new publications and also served as a forum for discussing relevant themes, encouraging informed public debate on digital technologies and society. Among several public debates organized by the Center throughout the year, several focused on relevant findings from the national ICT surveys conducted by Cetic.br/NIC.br. Public debates are one of the transparency mechanisms that legitimize the work on data production carried out by the Center. Below are some of the main events that took place in 2019.

▷ Progress of Digital Government Transformation: The 2018 UN e-Government Survey // Launch of the Portuguese Version of the 2018 UN e-Government Survey Report

February 2019 – Guimarães (Portugal)

This international conference was organized by the United Nations University Operating Unit on Policy-Driven Electronic Governance (UNU-EGOV) and the Portuguese Administrative Modernization Agency (AMA) with the aim of discussing progress made by countries in the development of e-government policies. This event also marked the launch of the Portuguese version of the 2018 UN E-Government Survey report, which is a global report that assesses the e-government development status of the 193 UN





Member States. This survey is conducted by the United Nations Department of Economic and Social Affairs (UNDESA) every two years. The translation into Portuguese of the UN report was the first result of the partnership between UNU-EGOV and Cetic.br/NIC.br.

The UN E-Government Survey report looks at how e-government can facilitate integrated policies and services across the three dimensions of sustainable development – economic, social and environmental – and serves as a tool for countries to learn from each other,

identify areas of strength and challenges in e-government, and shape their policies and strategies in the area of e-government (UNDESA, 2018)¹².

Cetic.br/NIC.br also participated in the panel “Impact of Measurements and Indices in the Development of Digital Government,” debating the importance of data production and statistics for monitoring digital government. The Center also signed a cooperation agreement with UNU-EGOV to collaborate and carry out joint projects in the area of electronic government and measurement.

¹² UNDESA: www.un.org/development/desa/publications/2018-un-e-government-survey.html

▷ **Debate Series on Culture, Education and Technology** // Launch of the 2018 Edition of the ICT in Culture, ICT in Education and ICT Kids Online Brazil surveys

April to June / September to November 2019 – São Paulo (Brazil)

Culture and education in the 21st century are being increasingly influenced by the spread of the Internet and mobile devices across different segments of society. The Internet has been a disruptive technology for cultural production, distribution and consumption, becoming a digital alternative that is likely to become an effective substitute for analog experience in the cultural domain. In the education sector, digital technologies are being integrated into teaching and learning processes aimed at improving learning outcomes, providing innovative and stimulating learning environments.

The Debate Series on Culture, Education and Technology started in 2018 as a joint initiative by the Research and Training Center of the Social Service of Commerce (CPF-Sesc), the Regional Center for Studies on the Development of the Information Society (Cetic.br/NIC.br), and Pontifical Catholic University of São Paulo (PUC-SP). This debate series acknowledges that digital technologies, in particular the Internet, have great potential to advance inclusion and equity in education and to promote access to culture by digital means.

The partnership among these organizations seeks to broaden the public debate on sociocultural and strategic aspects located at the interface between culture, education and technologies in contemporary society. The debate series is also aimed at discussing the space occupied by individuals in the digital ecosystem, which is permeated by conflicts between freedom and privacy, autonomy and control, universalization and inequality, and participation and ethics. Attention was also given to the appropriation of technologies by educators and children and adolescents.

In 2019, two cycles of the debate series were organized, one in the first half of the year and the other in the second. Each cycle is composed of three sessions of roundtable discussions where renowned authors, researchers and experts share their in-depth views on contemporary issues around the intersection of culture, education and technology. The roundtable discussions addressed the current Brazilian scenario regarding culture, education and appropriation of digital technologies, based on the data from the national ICT surveys produced by Cetic.br/NIC.br.

CYCLE I

▶ **Session 1 (April 2019)**

Panel: “Culture, Education and Technology and Citizenship in the 21st Century”

This panel discussed how Brazilians from different sociodemographic backgrounds – age, level of education and social class – have access to culture, education and technology. From a human rights and citizen’s perspective, panelists sought to reflect on

the opportunities and risks that a connected world brings to the domain of culture and education. The debate was underpinned by evidence provided by data from the ICT in Culture survey on the use of information and communication technologies in Brazilian cultural facilities, and the households survey conducted by Cetic.br/NIC.br.

Speakers: Danilo Santos de Miranda (Sesc SP), Demi Getschko (NIC.br), Maria Amalia Pie Abib Andery (PUC-SP). Moderator: Adriana Couto (TV Cultura).

Keynote address: "The New Consumer Society: Are We Happier?"

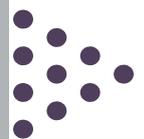
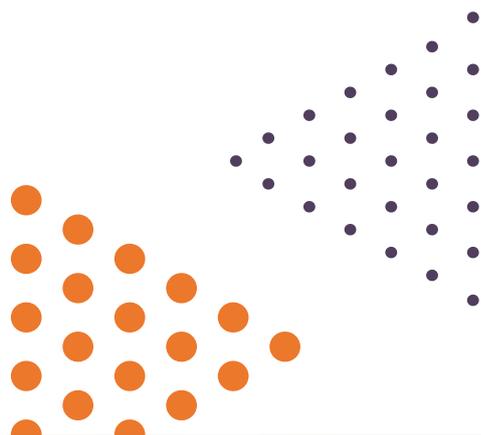
Keynote speaker: Gilles Lipovetski (University of Grenoble, France). Moderator: Bianca Santana (Journalist).

Launch of the 2018 Survey on the Use of Information and Communication Technologies in Brazilian Cultural Facilities: ICT in Culture.

Speakers: Fernando Almeida (PUC-SP) and Luciana Lima (Cetic.br/NIC.br).

Understanding the relationship between culture and socioeconomic development is not trivial. This is partly because of the broad concept of culture, which requires efforts by researchers to outline the issue. In addition to this complexity, the debate is influenced by the tendency of academia and policymakers to give priority to tangible and measurable phenomena, which do not always describe how cultural affairs matter for development. Despite the challenges inherent to this agenda, the relevance of culture for socioeconomic development is gradually gaining recognition and being debated by governments and international organizations.

(ICT in Culture 2018 Survey).



► Session 2 (May 2019)

Panel: “Cultural Production and Technology”

The cultural production of the 21st century is strongly influenced by the spread of the Internet. In this context, the creation and circulation of cultural goods have the potential to configure new markets, platforms, mechanisms of legitimization, and forms of participation. This panel aimed to discuss historical and current models of development and their effects on cultural production.

Speakers: George Yúdice (University of Miami) and Eliane Costa (Fundação Getúlio Vargas Rio de Janeiro). Moderator: Mauricio Trindade (Sesc-CPF).

► Session 3 (June 2019)

Panel: “Diversity and Technology”

Diversity can be expressed through a variety of representations and technologies capable of expanding or restricting the access of social groups and individuals to the production and diffusion of cultural values and educational goods. This panel presented reflections that involve the universe of diversity in digital culture, politics and education.

Speakers: Maria Antonieta Antonacci (PUC-SP) and Rafael Evangelista (University of Campinas - Unicamp). Moderator: Fernando Almeida (PUC-SP).

CYCLE II

► Session 1 (September 2019)

Panel: “Ethics, Education and Digital Culture”

This panel discussed the relationship between ethics and creative and reflective appropriation of technologies, raising questions about the effects of the dynamics of inequality, power and control on the rights and autonomy of individuals in the context of hypermodernity, in which digital environments play an important role.

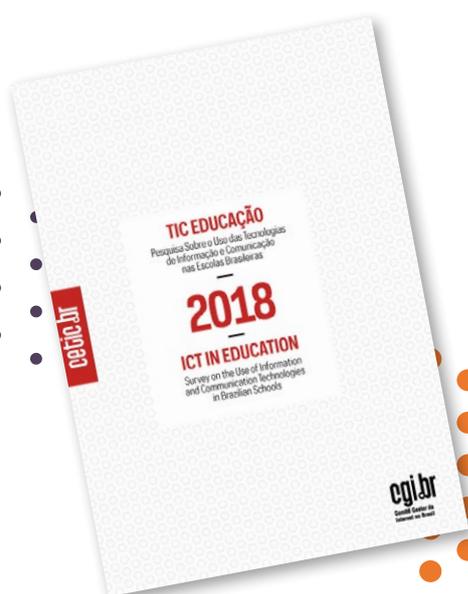
Speakers: Antônio Valverde (PUC-SP) and Caitlin Mulholland (Pontifical Catholic University of Rio de Janeiro - PUC-RIO). Moderator: Mauricio Trindade (Sesc-CPF).

► Session 2 (October 2019)

Panel: “Educational Content and Digital Ecology”

This panel deepened the debate on the creation of distributed and democratic forms of production, dissemination and appropriation of educational content in the Internet, focusing on issues related to autonomous creativity and critical analysis of content in the digital culture.

Speakers: Paula Sibilia (Fluminense Federal University - UFF) and Tel Amiel (University of Brasilia - UnB). Moderator: Fernando Almeida (PUC-SP).



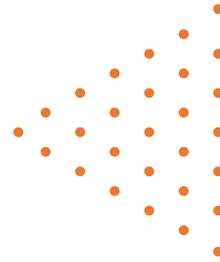
► Session 3 (November 2019)

Panel: “Literacy for Digital Citizenship”

Based on findings from the ICT in Education and ICT Kids Online Brazil surveys, this panel discussed the critical appropriation of digital technologies by children and adolescents and the role of education in the development of the capacity for reflective and analytical reading.

Keynote speaker: Cristina Ponte (University Nova de Lisboa, Portugal). **Moderator:** Patrícia Blanco (Instituto Palavra Aberta).

Launch of the following publications: 2018 editions of *ICT in Education* and *ICT Kids Online Brazil and Culture, Education and Technology in Debate – Volume II*.



▷ UNESCO International Conference on Artificial Intelligence and Education

May 2019 – Beijing (China)

This Conference was co-organized by UNESCO, the Ministry of Education of the People’s Republic of China and the National Commission of the People’s Republic of China for UNESCO. It was aimed at providing a platform for governments, international organizations, academia, civil society, and AI industries to discuss fundamental questions about the implications of AI in education. Focus

was given to the latest trends in AI and how these trends are shaping education and learning, and the lessons learned from emerging national policies and strategies for leveraging AI to achieve SDG 4. The conference was also an opportunity to strengthen international cooperation and partnership for promoting equitable, inclusive, and transparent use of AI in education.

The Conference not only reviewed the recent trends in the evolution of AI and its profound impact on human societies, economies, labor markets and education, but also contributed to possible policy responses aimed at the systematic integration of AI and education. Artificial intelligence has great potential to drive innovation in education, teaching and learning, and to accelerate the delivery of open and flexible education systems that enable equitable and inclusive education in line with SDG 4.

Cetic.br/NIC.br presented the panel "AI Transforming the Delivery and Management

of Education," which discussed the role of AI in revolutionizing the sourcing and delivery of programs of study and education management, highlighting how AI-based solutions can be harnessed to enhance and transform educational systems. Speakers in this session included: Paula Valverde (ProFuturo Foundation, Spain); Alexandre Barbosa (Cetic.br/NIC.br, Brazil); Jacqueline Strecker (UN High Commissioner for Refugees - UNHCR); and Zeng Dehua (Ministry of Education, China). Moderator: Tao Zhan (UNESCO Institute for Information Technologies in Education).

▷ 2019 International Federation of Library Associations and Institutions (IFLA) President's Meeting

May 2019 - Buenos Aires (Argentina)

The IFLA President's Meeting 2019 was held in the National Museum of Fine Arts in the city of Buenos Aires, Argentina. It involved the collaboration of the Library of the National Congress of Argentina, the Secretary of Culture of Argentina, the Mariano Moreno National Library, and the Buenos Aires City Government.

Under the theme "Motors of Change: Libraries and Sustainable Development," the event provided a great opportunity for debate among high-level participants around the idea that mobilized, organized and empowered

libraries can improve the lives of their communities and deliver on all of the UN 2030 Agenda. It featured presentations by renowned speakers from around the world and stimulated discussions and reflections involving the library and information community.

The event was the occasion for the presentation of the Development and Access to Information (DA2I) Report 2019, the second of a series of reports to which Cetic.br/NIC.br contributed by writing a chapter.

▷ 9th Brazilian Internet Forum

October 2019 - Manaus (Brazil)

Based on the Internet Governance Forum (IGF) format and promoted annually by CGI.br since 2011, the Brazilian Internet Forum is the main event for the discussion of themes related to Internet governance in the country. This forum is the stage where representatives of

different sectors are encouraged to discuss the most relevant issues for the consolidation and expansion of an increasingly diverse, universal and innovative Internet in Brazil. In the 2019 edition of this event, Cetic.br/NIC.br participated in three panels.

Panel: “Connectivity and Inclusion during the ISOC Brazil Annual Meeting”

This panel discussed the challenges and possibilities regarding access to the Internet and access to information in Brazil, especially in the Amazon region, respecting the special characteristics of the region. Cetic.br/NIC.br presented findings from its national ICT surveys to discuss the connectivity and digital inclusion landscape in the region.

Speakers: Edson Nascimento Silva Junior (Computing Institute of Federal University of Amazonas – IComp-UFAM), Eduardo Parajo (Brazilian Internet Association – ABRANET), João Guilherme de Moraes Silva (Information and Communication Technology Company of the Municipality of São Paulo - PRODAM), José Reginaldo Carvalho (IComp-UFAM), Luciana Lima (Cetic.br/NIC.br) and Moacir Brito Maia Neto (Coletivo Co-Nectar, Pará).

Panel: “Emotional Health and Well-Being in the Digital Context”

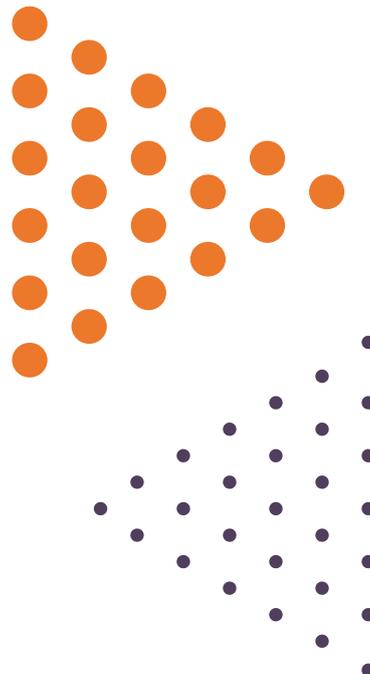
Based on the key findings from the ICT Kids Online Brazil 2018 survey, this panel discussed how to promote well-being of children and adolescents in the digital environment. The participation of representatives from academia, government, civil society, and Internet companies brought together diverse views on how to address key issues related to the use of technology by children and promoting health and well-being of children.

Speakers: Priscila Costa Schreiner (Public Prosecutor’s Office); Luciene Regina Paulino Tognetta (São Paulo State University – UNESP Araraquara); Ale Borba (Google Brasil); Daniela Fontes (Facebook); Juliana Cunha (SaferNet Brasil); Luisa Adib Dino (Cetic.br/NIC.br).

Panel: “Networked Digital Collections: From Digital Repositories to Semantic Networks”

This panel discussed how to protect and promote digital collections of memory institutions in Brazil. To this end, Cetic.br/NIC.br presented relevant data from the ICT in Culture 2018 survey on the scenario of digitization of collections in the country and initiatives under development by institutions from different sectors, with a view to discussing the main advances and challenges faced in the creation and dissemination of collections through the Internet.

Speakers: Alexandre Cesar Avelino Feitosa (Brazilian Institute of Museums – IBRAM), Alvaro Augusto Malaguti (Brazilian Research and Educational Network – RNP), Dalton Martins (University of Brasilia – UnB), Gabriel Bevilacqua (Instituto Moreira Salles), Luciana Lima (Cetic.br/NIC.br) and Mariana G. Valente (InternetLab).



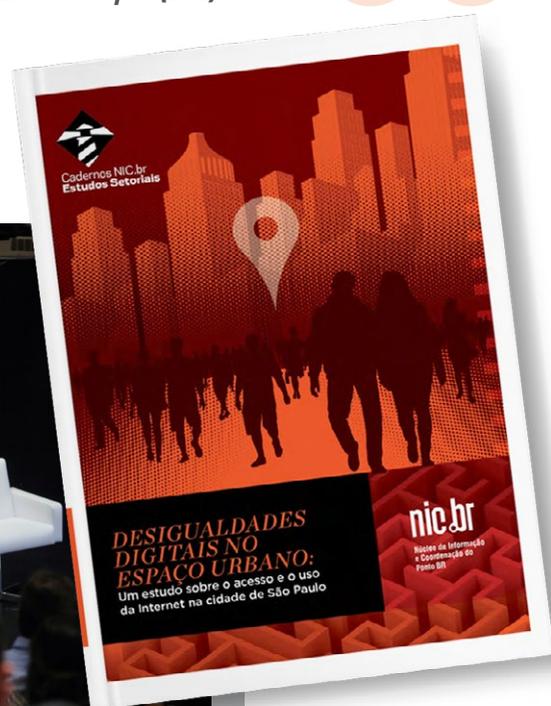
▷ Seminar Mapping Digital Inequalities: New Methodologies and Evidence for Public Policies // Launch of the Publications: ICT Households 2018 Survey and Digital Inequalities in Urban Space: A Study on Internet Use and Access in the City of São Paulo

October 2019 – São Paulo (Brazil)

The Seminar was organized by Cetic.br/NIC.br in partnership with the Center for Metropolitan Studies (CEM), the Brazilian Center for Analysis and Planning (CEBRAP) and the international project DiSTO - From Digital Skills to Tangible Outcomes, led by the London School of Economics and Political Science (LSE). The debate focused on digital inequalities in the urban space and the role of public policies in promoting digital inclusion in metropolitan areas.

The place where people live shapes the norms and customs of these individuals, builds horizons of opportunities and choices. The environment places limits on access to technologies and influences the type of access, skills, uses and digital experiences of the population.

Ellen Helsper (LSE)



The Seminar was marked by the launch of the Sectoral Study *Digital inequalities in the urban space: A study on Internet access and use in the city of São Paulo*. This unprecedented publication revealed inequities in the incorporation of ICT in the lives of São Paulo residents in the different areas of the São Paulo capital.

Panel 1: “Territory Matters: Methodological Innovations for Measuring Digital Inequalities at the Local Level.”

Panelists: Ellen Helsper (LSE); Tomás Wissenbach (CEBRAP); Luis Claudio Kubota (Institute of Applied Economic Research – IPEA). Moderator: Graziela Castello (CEBRAP).

Panel 2: “Digital Inequalities and Public Policies: Investigating the Relationship between Digital and Social Inequalities.”

Panelists: Karen Mossberger (Arizona State University - ASU); Marta Arretche (Center for Metropolitan Studies and University of São Paulo); Francisco Gaetani (School of Public and Business Administration of, Getulio Vargas Foundation – FGV-EBAPE). Moderator: Fábio Senne (Cetic.br/NIC.br)



▷ Workshop on Scientific Computing, Data Visualization & Analytics in Medicine in the Big Data Era // Launch of the ICT in Health 2018 Survey

October 2019 – São Paulo (Brazil)

The Scientific Computing, Data Visualization & Analytics in Medicine in the Big Data Era workshop, held by the National Institute of Science and Technology in Medicine Assisted by Scientific Computing (INCT-MACC) in São Paulo, was the stage for the launch of the ICT in Health 2018 Survey.

The sixth edition of the ICT in Health survey was released at the event, followed by a presentation of its main results and a discussion of key indicators on the adoption of ICT in Brazilian health establishments and their use and appropriation by doctors and nurses. As of this edition, the research also started to disseminate the results for primary healthcare

units (UBS). The release included the panel The Importance of Measurement and Indicators for the Improvement of Healthcare Policies, which featured the presentation and release of data from the ICT in Health survey.

Speakers: Patrice Degoulet (Faculty of Medicine Université Paris Descartes, France), Alberto Tomasi (Brazilian Ministry of Health), Jacson Venâncio de Barros (Informatics Department of the Brazilian Public Health System – DATASUS), and Marco Antonio Gutierrez (Heart Institute – InCor – USP). Moderator: Heimar Marin, scientific coordinator of the ICT in Health survey (Federal University of São Paulo – UNIFESP).



Digital technologies have become a strategic component in healthcare strategies and are essential in acquiring, storing and managing clinical and administrative patient data. Measuring the access to digital technologies in the healthcare facilities and their use and appropriation by healthcare professionals are critical for policymaking at the national, regional and organizational levels. The ICT in Health survey is an unprecedented initiative to produce reliable and internationally comparable ICT-related statistics in the health sector.

Heimar Marin (Scientific Coordinator of ICT in Health Survey / Federal University of São Paulo).



▶ Regional Forum on Artificial Intelligence in Latin America and the Caribbean

December 2019 – São Paulo (Brazil)

ARTIFICIAL INTELLIGENCE
Towards a humanistic approach

Regional Forum on AI in Latin America and the Caribbean
12-13 December 2019
São Paulo - Brazil



Organizers

- cetic.br
- nic.br
- cgi.br

Partners

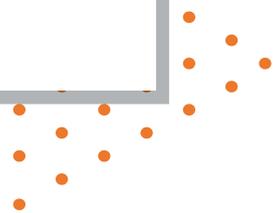
- USP
- Microsoft
- Brasscom

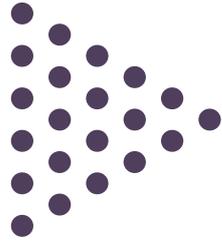
Institutional Support

- IBM
- Observacôm

Special Cooperation

- UNESCO
- UNESCO Regional Centre of Studies for the Development of the Information Society
- Ministry of Foreign Affairs
- Ministry of Science, Technology, Innovations and Communications
- Pátria Amada Brasil



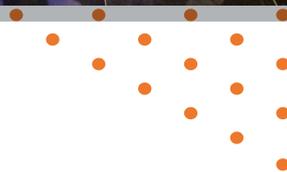
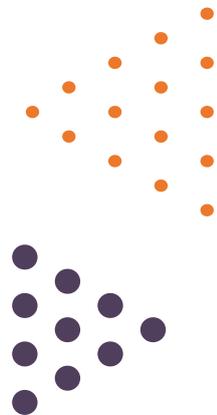
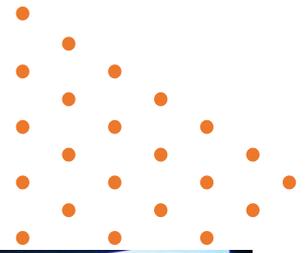


This regional forum was part of a series of United Nations Educational, Scientific and Cultural Organization (UNESCO) events on artificial intelligence (AI). It was organized by UNESCO, the Brazilian Network Information Center (NIC.br) through its Regional Center for Studies on the Development of the Information Society (Cetic.br/NIC.br), and the Brazilian government, through its Ministry of Foreign Affairs (MRE) and the Ministry of Science, Technology, Innovation and Communications (MCTIC). The overall purpose of this Regional Forum was to raise awareness and promote reflection on the opportunities and challenges that AI and its associated technologies pose for societies, governments, organizations and citizens. Recent advancements in AI and other digital technologies are deeply transforming our societies, with enormous potential for social good. The conference explored the potential of AI in relation to the SDGs, and how AI can help address many of humanity's challenges, including those related



to education, access to information, knowledge and science, culture, media, gender equality, and poverty reduction.

The forum brought together more than 600 stakeholders from 33 countries and had 51 speakers divided into 7 panels and 4 keynotes. It also provided an inter-sectoral dialogue between the main stakeholders in Latin America and the Caribbean, the public and private sector, the technical community, the media, academia, civil society, and international organizations, on the potential benefits and challenges of AI and its development.



Capacity-Building and Awareness-Raising

Cetic.br/NIC.br's capacity-building programs aim to bring together the main stakeholders involved in the production, analysis and use of ICT indicators in public policies, academia and sectoral market analysis.

These programs are directed at data producers and users, such as national statistical institutes, ministries, regulatory agencies, international organizations, and academic institutions. In addition to disseminating technical knowledge about survey methodology, these programs are a forum for promoting debates about the importance of ICT statistics for evidence-based policymaking and for discussing new measurement possibilities,

while enhancing the use of ICT in this process.

In addition to regular capacity-building and awareness-raising activities about the importance of ICT measurement, in 2019, the Center continued to offer its massive open online course about ICT and sustainable development. This pioneering initiative sought to promote awareness and capacity-building about the role of ICT in implementing and measuring the 2030 Agenda and the Sustainable Development Goals. Offered in an open and free format, the course engaged multiple stakeholders related to the intersection between ICT and sustainable development during a 10-week discussion.

▷ Capacity-building program: UNESCO Internet Universality Indicators

March 2019 – São Paulo (Brazil)



Cetic.br/NIC.br hosted the UNESCO Mersosul training workshop on the UNESCO Internet Universality Indicators (ROAM-X framework). The objective of this workshop was to train and empower representatives from countries in Latin America in

conducting data collection for the construction of the ROAM-X framework indicators. The workshop had 14 participants from the five countries: Ecuador, Mexico, Paraguay, Panama and Uruguay, in addition to UNESCO's Brasilia representative.

▶ ITU Regional Workshop on ICT Indicators for Portuguese-speaking African Countries

March 2019 – Luanda (Angola)



Cetic.br/NIC.br collaborated with the International Telecommunication Union (ITU) and the National Authority of Communications in Portugal (ANACOM) to develop the Workshop on ICT Indicators for Portuguese-Speaking African Countries hosted by the Angolan Institute of Communications (INACOM), the regulator of telecommunications in Angola. The workshop was held in Portuguese and in the space of four days, it covered both manuals proposed by the ITU for producing indicators from telecom

operators (supply side) and household surveys (demand side). Cetic.br/NIC.br delivered a two-day course based on the experience accumulated over several years of conducting ICT surveys on households, and also translated the content provided by ITU and designed the instruments and dynamics used during the workshop. More than 30 professionals from ministries, regulators and national statistical offices from the five Portuguese-speaking countries in Africa took part in this workshop.

▶ Professional Training Workshop: Big Data, Digital Economy and Sustainable Development

April 2019 - Santo Domingo (Dominican Republic)

This workshop was organized by UNECLAC, with the support of Data-Pop Alliance, National Statistical Office (ONE) and BigDATA Digital economy for Latin America and the Caribbean. Cetic.br/NIC.br was invited to speak in the panel From Big Data to Action. Cetic.br/NIC.br also presented the initiatives for combining data sources to understand the digital economy based on the article “Web Scraping to Predict e-Commerce Indicators,” by Pitta, Martins Júnior, Dias and Nascimento Silva.

Speakers: Raul Andres Gomez of the National Administrative Department of Statistics (DANE/Colombia), Hugo Hernández of the National Institute of Statistics and Geography (INEGI/Mexico), Isabela Coelho (Cetic.br/NIC.br), and Aline Rodriguez of the Brazilian Institute of Geography and Statistics (IBGE/ Brazil).
Moderator: Alejandro Patiño (UNECLAC).

▷ 9th NIC.br Annual Workshop on Survey Methodology // Data for Public Statistics: Data Science, Big Data & Artificial Intelligence

May 2019 – São Paulo (Brazil)

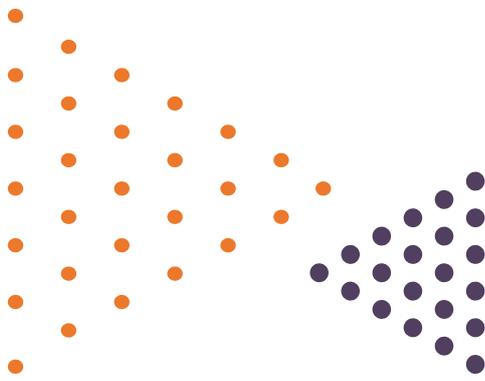


The goal of this program went beyond covering theoretical and practical concepts about survey methodology, also aiming to stimulate debate among data producers and users about emerging themes associated with new digital technologies. In addition to discussing the underlying concepts behind these themes, the participants had the opportunity to debate major challenges related to the measurement of the adoption and use of new technologies and their implications.

The 9th NIC.br Annual Workshop on Survey Methodology program offered a range of short courses and panels aimed at discussing how big data and artificial intelligence can be used to support the production and

dissemination of public statistics. Renowned experts, researchers, public policymakers, and representatives of civil society and international organizations gathered in São Paulo May 20 to 23 to deliver this capacity-building program to 65 participants from 13 countries.

The ninth edition of the Workshop was co-organized by the National School of Statistical Sciences (ENCE) of the Brazilian Institute of Geography and Statistics (IBGE). Participants had the opportunity to attend lectures and a short course with interactive activities, practical examples and case studies. Taking into account the current scenario, where massive amounts of data are being produced at fast rates, the discussions were centered



around the data production ecosystem, the use of big data and artificial intelligence for decision-making, and identifying the challenges and barriers associated with the use of these tools.

The program started with a panel for sharing experiences with data production for decision-making, bringing together representatives from different sectors: Professor Denise Britz do Nascimento Silva (National School of Statistical Sciences / Brazilian Institute of Geography and Statistics – ENCE / IBGE), Bernardo Canedo (Brazilian Institute of Public Opinion and Statistics– IBOPE DTM), Fernanda Campagnucci (São Paulo City Local Government) and Professor Iñigo Herguera (Universidad Complutense of Madrid).

The continuation of the workshop program included presentations and short courses by these speakers: Professor Pedro Luis Nascimento Silva (ENCE / IBGE), Professor

Jan van den Brakel (Statistics Netherlands / Maastricht University), Professor Danny Pfeffermann (Central Bureau of Statistics of Israel), Emmanuel Letouzé (Data-Pop Alliance), Professor Johannes Bauer (Michigan State University), Professor Caitlin Sampaio Mulholland (PUC-RIO), and Professor Pamela Campanelli (The Survey Coach).

During the workshop, Daniel Ker, from the Organization for Economic Co-operation and Development (OECD), launched the Portuguese version of the *Going Digital Toolkit*, a tool that includes indicators and guidelines that can support countries in fulfilling the promises of digital transformation. There was also the launch of the book *Measurement of digital health: Methodological recommendations and case studies*, a production by Cetic.br/NIC.br and the Pan American Health Organization (PAHO) (more details on page 58).



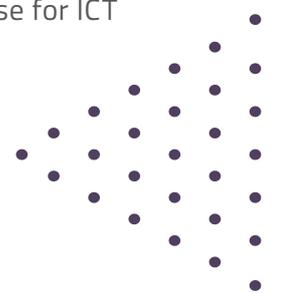
▶ Capacity-building for Journalists: International Congress on Investigative Journalism

June 2019 – São Paulo (Brazil)

As part of the 14th International Congress of Investigative Journalism, Cetic.br/NIC.br and UNESCO organized the panel “What you need to know in order not to be ashamed when covering topics de Internet,” which sought to discuss key concepts for understanding the Internet ecosystem and its impacts on society. The objective of the meeting was to contribute to more informed and critical journalistic coverage on Internet issues, having as a debate axis the *Principles for Governance and Use of the Internet in Brazil* from the CGI.br.

Speakers: Veridiana Alimonti (Electronic Frontier Foundation – EFF), Danilo Doneda, (Brasiliense Institute of Public Law), Guilherme Canela (UNESCO Montevideo) and Winston Oyadomari (Cetic.br/NIC.br).

Cetic.br/NIC.br also offered the workshop “How to Use R to Investigate the Web in Brazil,” which presented journalists and journalism students with tools to use for ICT research using the R software.



▷ Summer School on Inclusive Digital Innovation and Transformation in Latin America

July 2019 – Barcelona (Spain)



The IBEI-ECLAC-CAF Summer School (jointly offered by the Barcelona Institute of International Studies – IBEI, ECLAC, and development Bank of Latin America- CAF), in collaboration with Cetic.br/NIC.br, is aimed at leading development professionals and ICT policy experts who carry out their professional activity in public administrations, multilateral organizations, research centers, NGOs, foundations, companies and universities interested in the role of innovation for development.

The sixth edition of the summer school addressed themes related to: digital integration at the regional level in Latin America; digitization and its impact on employment and production; new sources of big data and tools for data analytics, artificial intelligence and blockchain, and the regulation

of innovation from a comparative perspective for Europe and Latin America. The program was divided into four blocks:

- i) Digitalization and Employment;
- ii) Digitalization of Production & Big Data;
- iii) Digitalization of Production & Artificial Intelligence; and
- iv) Regulation & Innovation.

The summer school is also a space for the exchange of experiences and practical cases related to the development of models for the digitization of production, investment, and financing of broadband infrastructure in suburban and rural environments, and issues on universal service and funds, among others. The presence of experts from different countries allowed for a comparative perspective between Latin America and Europe, in addition to dialogue about the role of new disruptive technologies in innovation and production.



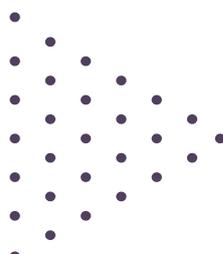
▶ ITU Regional Training Workshop on Information and Communication Technology (ICT) Indicators for Latin America

October 2019 – Mexico City (Mexico)



Cetic.br/NIC.br collaborated with the International Telecommunication Union (ITU) in the Regional Training Workshop on Indicators of Information Technology and Communication (ICT) for Latin America, hosted by the Federal Institute for Telecommunication (IFT), the regulator of telecommunications in Mexico. The workshop focused on the main updates to the methodological standards proposed by the ITU for the measurement of access to and use of ICT, detailing both demand and supply-side indicators for households

and individuals. Cetic.br/NIC.br delivered a session aimed at describing its ICT statistics production process and sharing experience with the countries of the region on the Brazilian measurement model in the field of ICT, focusing on the implementation of multistakeholder expert groups, quality control, and data processing and sharing. More than 50 professionals from ministries, regulators and national statistical offices from 11 countries participated in person, but the workshop also allowed remote participation by 2,500 people.





▶ Brazilian Workshop on Artificial Intelligence and Children's Rights

December 2019 – São Paulo (Brazil)



Cetic.br/NIC.br hosted a meeting to discuss the UNICEF AI and Child Rights Policy project. Around 25 Brazilian experts from academia, civil society and business participated in the event. Jasmina Byrne and Steven Vosloo from the Office of Global Insight and Policy presented the background policy analysis and project plan. Two central questions guided the discussions. The first focused on the challenges to more

child-friendly AI, and the second focused on how the challenges can potentially be overcome. The participants were supposed to bring the Brazilian perspective to the issues. They emphasized that since people who do not have access to technology cannot fully contribute to or benefit from AI systems, the issue of the digital divide should be considered even more pressing in the age of AI systems.

► **Massive Open Online Course** // Tech for Good: The Role of ICT in Achieving the SDGs

This online course, offered in a MOOC format through the edX Platform¹³, is a joint initiative by Cetic.br/NIC.br, UNESCO and the SDG Academy. It provides students with a set of 10 modules that address ICT as a critical component for achieving the SDGs.

The course brings together thought leaders and changemakers from all regions of the world in fields related to ICT and sustainable development. It covers the role of ICT in achieving the SDGs in four important areas: i) how digital technologies are empowering billions of people around the world by providing access to education,

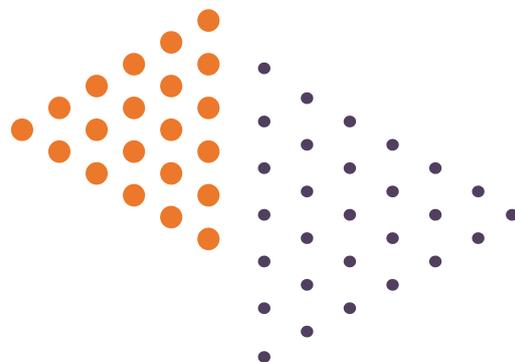
healthcare, banking, and government services; how ICT is being used to inform smarter, evidence-based policies to improve people's lives in fundamental ways; ii) how these technologies can be used for measuring and monitoring the achievement of the SDGs; iii) new challenges that technology can introduce, such as privacy, data management, risks to cybersecurity, e-waste, and the widening of social divides; and iv) ways in which stakeholders are coming together to answer big questions about what our future will look like in a hyper-digitized world.

TECH FOR GOOD IS FOR:

► **Technology specialists who want to understand more about how ICT is being used to improve people's lives around the world.**

► **Sustainable development practitioners who need to understand the opportunities and limitations of technology in a development context.**

► **Advanced undergraduates and graduate students interested in the key concepts and practices of this exciting and ever-changing field.**



¹³Available free of charge and in open format on the edX online course platform (www.edx.org). The course is available in English with subtitles in Portuguese and Spanish.

TECH FOR GOOD – Syllabus



MODULE 1: WELCOME TO THE DIGITAL AGE

- ▶ Introduction to the Course
- ▶ Bridging the Digital Divide
- ▶ Three Approaches to ICT for the SDGs

MODULE 2: TECHNOLOGY FOR GOVERNMENTS AND CITIZENS

- ▶ Equity and Access to Services
- ▶ User-Driven Public Administration
- ▶ It's All About the Data
- ▶ The Open Government Approach
- ▶ Case Study: Aadhaar in India
- ▶ The Challenges of Digital Government

MODULE 3: ICT INFRASTRUCTURE

- ▶ Enabling ICT: The Role of Infrastructure
- ▶ Promoting Digital Inclusivity
- ▶ Innovations in Infrastructure
- ▶ Building Smart Sustainable Cities
- ▶ ICT as Infrastructure: A Look at Societal Platforms

MODULE 4: ICT INNOVATIONS IN HEALTH

- ▶ Achieving Universal Health Coverage
- ▶ Improving Healthcare Delivery
- ▶ Involving the Community
- ▶ Evidence in Action: Success Stories of ICT and Health
- ▶ Emerging Challenges and Opportunities

MODULE 5: LEARNING IN KNOWLEDGE SOCIETIES

- ▶ The Ecosystem of ICT for Education
- ▶ Education for a Connected World
- ▶ Sharing Knowledge: ICT, Openness, and Inclusion
- ▶ Measuring ICT and Education: Frameworks
- ▶ Measuring ICT and Education: Data and Indicators
- ▶ Rethinking ICT for Education Policies

MODULE 6: PROMOTING FINANCIAL INCLUSION

- ▶ An Introduction to Financial Services
- ▶ The Potential of Digital Platforms
- ▶ Mobile Payments for Marginalized Communities
- ▶ ICT for Enabling Access to Credit
- ▶ Replacing the Cash Economy
- ▶ The Challenges of ICT-enabled Financial Inclusion

MODULE 7: MEASUREMENT AND METRICS

- ▶ Managing Data for the SDGs
- ▶ ICT Innovation for Statistical Development
- ▶ Engaging with Data: Communications and Citizen Empowerment
- ▶ Case Study: Brazil's Cetic.br/NIC.br
- ▶ Measuring ICT
- ▶ ICT for Monitoring the SDGs
- ▶ Limitations of ICT for Monitoring the SDGs

MODULE 8: ARTIFICIAL INTELLIGENCE

- ▶ An Introduction to Artificial Intelligence
- ▶ Who Drives the Agenda on "AI for Good"?
- ▶ Implications for Discrimination and Exclusion
- ▶ The Human Side of AI Risks and Ethics

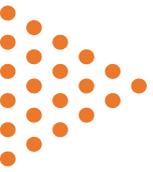
MODULE 9: CONCERNS FOR OUR DIGITAL FUTURE

- ▶ Privacy and the Importance of Trust
- ▶ Knowing your Data Rights
- ▶ Cybersecurity
- ▶ The Downsides of Digital

MODULE 10: THE WAY FORWARD

- ▶ The New Workforce: Six Points about the Future of Work
- ▶ The Meaning of Work in the Digital Era
- ▶ The Open Movement
- ▶ Closing Thoughts on ICT for the SDGs





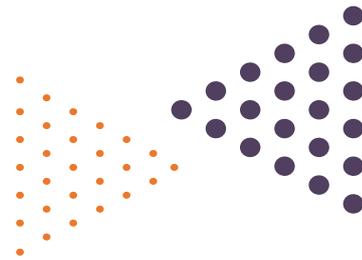
Methodological Support for Strategic Partners

In 2019, Cetic.br/NIC.br continued to work alongside strategic partners in the area of data and ICT-related statistics production, data provisioning and sharing, data analysis, and capacity-building on survey methodologies and innovative methods of data collection.

Based on a multi-stakeholder approach, Cetic.br/NIC.br works in close cooperation with important partners from relevant areas of government (regulators, national statistical offices, various ministries), academia, research institutes and international organizations to develop an ICT measurement ecosystem that allows for the production of sound and updated data for policymaking and research. Cetic.br/NIC.br also provides technical support

and capacity-building programs to decision-makers and data producers in Latin America and Portuguese-speaking countries in Africa.

Cetic.br/NIC.br is also an active player in the international arena. In recent years Cetic.br/NIC.br has been cooperating with some national statistical offices in Latin America and with UNECLAC, UNESCO, ITU and OECD in the area of measurement, indicators, and survey methodologies.



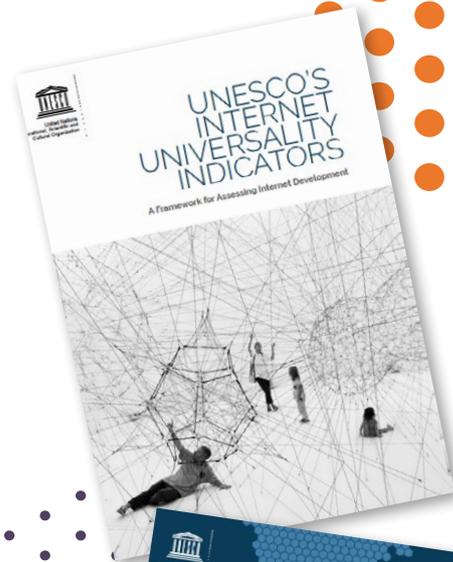
► UNESCO Internet Universality Indicators

Cetic.br/NIC.br has contributed to the development of the UNESCO Internet Universality Indicators since the beginning. In 2014, NIC.br and the Latin America and Caribbean Network Information Centre (LACNIC) supported the production of a background paper and proposed categories of indicators of Internet Universality. NIC.br also opened up a dialogue and engaged key stakeholders in Brazil who could provide feedback on different phases of the consultation process; organized and hosted a public consultation on the “ROAM Framework” proposal; provided Portuguese and Spanish translations of key UNESCO documents such as the *Keystones to Foster Inclusive Knowledge Societies*; and conducted the pretest and pilot for the Internet

Universality Indicators in Brazil. The pre-pilot and pilot phases run in Brazil were carried out by Cetic.br/NIC.br.

In 2019, Cetic.br launched the report *“Assessing Internet Development in Brazil: Using UNESCO Internet Universality ROAM-X Indicators.”* The report was the result of efforts by Cetic.br/NIC.br to gather data on a wide range of the indicators approved by UNESCO in November 2018. This research was conducted between July 18 and August 27, 2018, by the Brazilian Network Information Center (NIC.br), through the Regional Center for Studies on the Development of the Information Society (Cetic.br). The methodology of this application was based on UNESCO’s guidelines for the pilot document. The following steps were carried out:

- ▶ **Desk-based research into published and online reports, official statistics, independent surveys, and written assessments produced by academics, research institutes, and other credible and authoritative sources;**
- ▶ **Requests for information from government departments, private companies, and other sources;**
- ▶ **Individual discussions (interviews) with informants from government departments, private companies and other sources.**



▶ Monitoring the Mercosur Digital Agenda

In 2019, at the request of the Brazilian Ministry of Foreign Affairs, in the office of the Mercosur pro tempore presidency, Cetic.br/NIC.br prepared the 2018-2020 Mercosur Digital Agenda Report: Overview of Indicators. This pioneering report in Mercosur aims to systematize the available indicators on the different dimensions of the Mercosur digital agenda for the 2018-2020 period. The report presents a mapping of key indicators related to the development of the digital agenda in the Mercosur countries.

The mapping presented allows visualization of the starting points for key issues of the initiative, identifying the main challenges in terms of both actions and measurement. The report is expected to be relevant for supporting evidence-based decision-making, contributing to the achievement of the objectives formulated by the MERCOSUR Digital Agenda Group. The report is available in Portuguese and Spanish.



▷ Cooperation with the Inter-American Development Bank (IADB)

Cetic.br/NIC.br and the Inter-American Development Bank (IADB) developed a joint action plan to develop capacities of the Latin American and Caribbean countries to carry out quality surveys on the use of ICT in healthcare facilities. The overall goal is to support the generation of regionally comparable indicators and their use for decision-making in the health sector. The action plan, to be implemented in 2020-2021, focuses on the implementation of a series of workshops that will promote the appropriation of methodological frameworks and the development of national strategies to analyze and monitor the use of ICT in healthcare facilities. The workshops will also seek to facilitate the

exchange of experiences and good practices between countries.

Methodological support for a pilot project to carry out an ICT in health survey in El Salvador was carried out in late 2019 and is projected to be scaled up to seven more countries in the LAC region. The final product will be a regional report based on comparable indicators on the current scenario of ICT use in healthcare facilities. A regional workshop will be organized to share the results of the analysis and to exchange experiences and good practices between participant countries. The action plan will be framed in a Memorandum of Understanding (MoU) signed by Cetic.br/NIC.br and IADB in 2020.

▷ BRICS Contact Group on Economic and Trade Issues Meeting (CGETI)

Cetic.br/NIC.br participated in the preparatory meeting for the BRICS¹⁴ Summit Meeting, which took place in November 2019. Cetic.br/NIC.br was invited to present its experience with measuring electronic commerce and the key findings on this topic from the new e-commerce module of the ICT Households 2018 survey. The reformulation

of the e-commerce module of the ICT Enterprises 2019 survey was presented. Cetic.br/NIC.br also presented its big data projects aimed at measuring e-commerce from big data sources, emphasizing the importance of the convergence of data collection methods for the understanding of wide areas of the digital economy.

▷ Workshop with Children – Brazil's Contribution to the General Comment on Children's Rights in the Digital Environment

Cetic.br/NIC.br, in partnership with SaferNet Brazil, contributed to the General Comment on Children's Rights in the Digital Environment, which was sent to the Committee on the Rights of the Child (CRC), which is responsible for monitoring and reporting on the implementation of the United Nations Convention on the Rights of the Child (UNCRC). This project involved carrying out four workshops with teenagers from 14 to 16 years old. The workshops were held in São Paulo (São Paulo) and Salvador (Bahia) in June 2019, with students from public and private schools.

The objective of the workshops was to conduct specific activities with the groups of teenagers to explore the ways in which children use technology in their daily lives, and to listen and to record their opinions and perceptions about children's rights in the digital age. The methodology adopted was developed by 5Rights, in partnership with Western Sydney University and the London School of Economics and Political Science. The methodology was applied in 42 workshops, in 21 countries, with 420 children and adolescents around the globe.

¹⁴This is the acronym for an association of five major emerging national economies: Brazil, Russia, India, China and South Africa.



The Role of ICT for the SDGs

▶ Education & Digital Technologies: Policy Innovation and Strategies for Monitoring and Implementing SDG 4

July 2019 – New York (United States)

During the UN High-Level Political Forum (HLPF) in 2019, a side-event was organized jointly by Cetic.br/NIC.br, the UNESCO Regional Office in Montevideo, the UNICEF Division of Data, Research and Policy, and the Ministry of Education and Innovation of the City of Buenos Aires. This side-event was carried out with the support of the Permanent Mission of Argentina to the UN. Its objective was to promote debate on the role of digital technologies as a critical component for achieving SDG 4 – “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.”

The role of education in the development of society is undeniable. Education permeates and contributes to progress in all the 2030 Sustainable Development Goals (SDGs) and plays a key role in building sustainable, inclusive and resilient societies. Education also has meaningful linkages with almost all the goals in the 2030 Agenda for Sustainable Development: It can bring information about health and nutrition to families and children, help in economic development through better training and preparation for the labor market, and is key for developing a culture of sustainability and care for the planet.

The availability of ICT in schools, combined with their critical use by teachers and students, has the potential to enhance the benefits already associated with education, such as facilitating access by students, teachers and communities to information and knowledge, development of digital skills, and expanding opportunities for social, cultural and economic participation and engagement. Despite the importance of ICT for achieving SDG 4, data on ICT in education is still unavailable for many countries, particularly those in the Global South; time series data is also scarce, limiting the possibility of tracking progress in SDG 4 and its ICT-related targets.

SDG 4 was one of the key points discussed at the UN HLPF in 2019 under the thematic umbrella “Empowering People and Ensuring Inclusiveness and Equality.”

The side-event promoted a lively debate on the progress made so far and pending challenges for measuring SDG 4, particularly its targets related to ICT, innovation, and the future of learning and digital skills. It was also a good opportunity to showcase digital innovation in education initiatives adopted by local governments in Latin America and African countries and to identify lines of action for raising awareness and engaging key stakeholders in achieving SDG 4. The side-event was also the stage to announce the draft of the *Practical Guide to Implement Surveys on ICT Use in Primary and Secondary Schools*, which seeks to serve as a conceptual and methodological reference for the design and implementation of surveys of ICT use in schools, targeting teachers, principals and students. This guide is the result of an effort undertaken by the Regional Center for Studies on the Development of the Information Society (Cetic.br/NIC.br) and the UNESCO Institute for Statistics (UIS) to contribute to the production of quality, internationally comparable data on ICT in education.

Speakers: Soledad Acuña (Ministry of Education and Innovation of the City of Buenos Aires, Argentina), Guilherme Canela (Regional Adviser for Communication and Information, UNESCO Montevideo Office), Silvia Montoya (Director of UNESCO Institute for Statistics - UIS/UNESCO), Jasmina Byrne (Chief, Policy Lab, UNICEF Division of Data, Research and Policy), Shafika Isaacs (Specialist in Digital Learning for Social Equity, South Africa). Moderator: Alexandre Barbosa, (Head of Cetic.br/NIC.br, Brazil).

▷ Policy Paper: ICT for Sustainable Development: Recommendations for Public Policies That Guarantee Rights

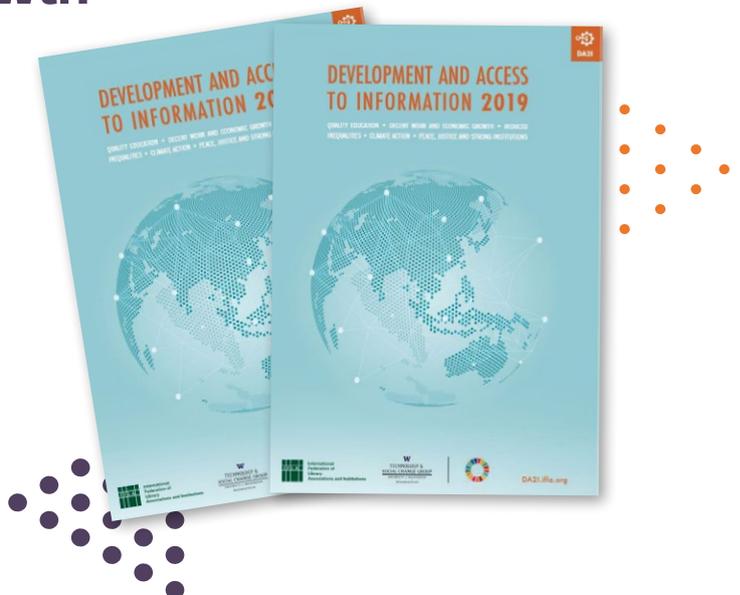
This policy paper is the result of the partnership between Cetic.br/NIC.br and the UNESCO Regional Science Office for Latin America and the Caribbean in Montevideo. This publication is aimed at public policymakers, researchers and those interested in the role of information and communication technologies (ICT) for the implementation of the Sustainable Development Goals (SDGs). The policy paper seeks to provide decision-makers with tools for reflecting on the design and development of public policies to ensure that ICT contributes to development in terms of sustainability, inclusion and social justice, in line with the commitments embodied in the 2030 Agenda and the SDGs. It also shows how ICT can contribute, not only to reaching the SDGs (through access to information and ICT-based solutions and resources), but also to measuring progress towards the achievement of the SDGs. In this context, some emerging technologies are discussed, such as big data, artificial intelligence and the Internet of Things.



Entitled *ICT for Sustainable Development: Recommendations for Public Policies That Guarantee Rights*, the paper was launched in July during the 4th United Nations High-Level Political Forum on Sustainable Development (HLPF) in New York. The policy paper, authored by Olga Del Rio Sánchez, Pablo J. Martínez Osés, Raquel Martínez-Gómez and Silvia M. Pérez, under the technical and editorial coordination of Cetic.br/NIC.br, is available in Portuguese, Spanish and English.

▷ Book Chapter: “Development and Access to Information (DA2I) Report 2019: A2I for Decent Work and Economic Growth”

The DA2I is a series of reports carried out jointly by the International Federation of Library Associations and Institutions (IFLA) in partnership with the Technology and Social Change Group of the University of Washington (TASCHA). These reports monitor the progress being made by countries toward fulfilling their commitment to promoting meaningful access to information as part of the UN Sustainable Development Goals. Each DA2I report focuses on the SDGs selected for review at the High-Level Political Forum in the year



of publication. The 2019 edition featured thematic chapters by guest authors on how access to information promotes the achievement of each of the following SDGs: Quality Education (SDG 4), Decent Work and Economic Growth (SDG 8), Reduced Inequalities (SDG 10), Climate Action (SDG 13), and Peace, Justice and Strong Institutions (SDG 16).

Chapter 4, authored by Cetic.br/NIC.br and entitled "A2I for Decent Work and Economic Growth," shows how access to information is a key factor in achieving SDG 8, which concerns inclusive, sustainable economic growth and employment. The

essay first addresses how information and communication technologies (ICT) play an important role in virtually every aspect of the global economy and are key to catalyzing development, because ICT instantly connects individuals to the world, expands educational opportunities, sparks creativity and innovation, opens the door to global financial services, and opens doors to historically disadvantaged groups of people, including women, youths and people with disabilities. It also argues that ICT only achieves its full economic potential when people develop the necessary skills to use information meaningfully.

▷ Defining ICT Indicators for the SDGs: Task Force on ICT for SDGs

Understanding that ICT is a fundamental catalyst for development and plays an important role in achieving the SDGs, it is important that all areas impacted by technologies be measured and monitored. The Task Group on ICT for SDGs was launched in 2017 and is co-led by the UN Department of Economic and Social Affairs (UNDESA) and ITU. It is an open initiative where all members of the Partnership on Measuring ICT for Development and other interested agencies and stakeholders, such as Cetic.br/NIC.br, can participate. In 2019, Cetic.br/NIC.br continued to contribute to the task force.

The main objective of the task group is to develop a thematic list of ICT indicators for measuring ICT access and use in sectors relevant to the SDGs that are currently not covered by the SDG indicator framework. The task group also aims to improve the availability of disaggregated data for the existing indicators. It collaborates through audio conferences and online, as well as in face-to-face meetings. Cetic.br/NIC.br contributes actively by participating in the group's discussions and sharing the Center's experience with collecting internationally comparable ICT-related indicators for development.

▷ Right to Science at the High-level United Nations Conference on South-South Cooperation

Cetic.br/NIC.br participated in the panel discussion "Right to Science: Access to Knowledge," organized by UNESCO at the Second High-level United Nations Conference on South-South Cooperation in Buenos Aires, Argentina, in March 2019. This panel discussion

was an open and rigorous debate about science and access to knowledge, including indigenous knowledge, as a contributor to peace and to achieving the Sustainable Development Goals and the 2030 Agenda. It also highlighted cross-cutting aspects of science as a human right,

including empowerment of youth, equality of opportunity, ending discrimination, and promoting academic freedom.

Speakers: Jorge Tezón (Manager of Scientific and Technological Development of the National Scientific and Technical Research Council – CONICET – in Argentina), Jesús Guadalupe Fuentes

Blanco (Executive Council, Latin America and the Caribbean Indigenous Fund), Patricia Tappatá Valdez (Director of UN Category 2 International Centre for the Promotion of Human Rights - CIPDH), Fabio Senne (Project Coordinator, Cetic.br/NIC.br), and Joshua Setipa (Director, UN Technology Bank for Least Developed Countries – UN-LDC).

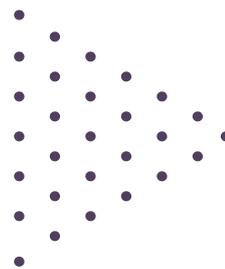
▷ UNESCO Information for All Programme (IFAP) Working Group Meeting

Cetic.br/NIC.br joined the event Unesco Information for All Programme (IFAP) Working Group Meeting and Open Talks on Access to Information, which took place in Kuala Lumpur (Malaysia), in September 2019. The event had the participation of the National Information for All Programme (IFAP) Committees from Mongolia, Thailand and Uzbekistan, and information and communication technology (ICT) policymakers, regulators and academics from Bangladesh, Cambodia, India and Malaysia for an IFAP Working Group meeting on Information for Development, with the theme “IFAP Priorities: Information for Development: New trends and Issues.”

Hosted by the Ministry of Communications and Multimedia (Malaysia), with the support of UNESCO, the meeting discussed how

information and knowledge play a key role in making sure that development is people-driven, relying on the potential of all, including women and youths. The Assistant Director-General for Communication and Information, Moez Chakchouk, confirmed that IFAP will support Member States in ensuring that the digital revolution is harnessed for eradication of poverty, empowerment, informed decision-making, and human development, to strengthen the foundations of peace.

Cetic.br/NIC.br reiterated the importance of measurement for policy design and trends in measuring tangible outcomes and well-being in the digital economy. ICT also plays an important role in responding to new demands for monitoring digital transformation and the digital economy through high-quality and timely data¹⁵.



¹⁵ en.unesco.org/news/right-access-information-highlighted-ifap-its-meeting-malaysia.



Debating the Challenges of ICT Measurement in International Forums: Sharing Experiences with Data Production

Cetic.br/NIC.br is dedicated to the systematic production of indicators and statistics about ICT access and use in Brazil in various sectors of society. With 14 years of experience, the Center adopts the methodological recommendations established by international organizations that work with the measurement and analysis of ICT statistics, enabling the comparison of its indicators with

those of other countries. Cetic.br/NIC.br also contributes to the construction of these recommendations and actively participates in discussions about the indicators.

In 2019, the Center participated in discussions held in various national and international forums dedicated to ICT methodologies and indicators, which were focused on their review and definition. Some of those events are highlighted below.

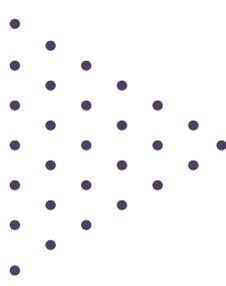
▶ **Mobile Learning Week 2019: Artificial Intelligence for Sustainable Development**

March 2019 – Paris (France)

Held annually since 2011 at UNESCO Headquarters in Paris, the Mobile Learning Week aims to discuss the role of information and communication technologies in expanding and developing access to equitable and quality education, as foreseen in the UN 2030 Agenda Sustainable Development Goals (SDGs), in particular, SDG 4 related to ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all. The event gave the educational community, academia, governments,

the private sector, and other stakeholders a unique opportunity to discuss the role of artificial intelligence for sustainable development.

In addition to participating in discussions during the policy forum, workshops and symposium, Cetic.br/NIC.br was invited to speak in the session "Strategy Lab: the AI in Education Readiness Index." Cetic.br/NIC.br also contributed to the debates held in parallel meetings to discuss the potential of artificial intelligence to improve teaching and learning processes.



▶ **World Summit on the Information Society (WSIS) Forum 2019: Information and Communication Technologies for achieving the Sustainable Development Goals**

April 2019 – Geneva (Switzerland)

The World Summit on the Information Society (WSIS) is the largest annual meeting on the theme “ICT for Development,” and is co-organized by the International Telecommunication Union (ITU), UNESCO, UN Program for the Development (UNDP) and UN Conference on Trade and Development (UNCTAD). In addition to serving as a multisectoral platform for discussing the implementation of the WSIS lines of action for sustainable development, the forum serves as a stage for important discussions on the role of ICT in the implementation of the SDGs in the context of the 2030 Agenda.

On this occasion, Cetic.br/NIC.br contributed with a presentation on data production in the session entitled “Measurement of Progress Towards the SDGs through ICT Indicators,” organized by the Partnership on Measuring ICT for Development. In addition, Cetic.br/NIC.br also participated in the Thematic Workshop “Connecting the Circular model of E-waste Management to the Sustainable Development Goals,” organized by ITU in conjunction with the Basel, Rotterdam and Stockholm conventions Secretariat (BRS).

▶ **E-Commerce Week 2019, United Nations Conference on Trade and Development (UNCTAD)**

April 2019 – Geneva (Switzerland)

UNCTAD’s e-Commerce Week is the leading forum for ministers, government officials, decision-makers, business representatives, international organizations, development banks and other stakeholders to discuss opportunities and challenges associated with the development of the digital economy. Under the theme “From Digitalization to Development,” the 2019 edition emphasized how to overcome existing barriers hampering the growth of e-commerce by implementing more effective policies and promoting an

enabling regulatory and business environment to move toward sustainable development. At this meeting, the participants sought to understand the need to harmonize statistics about e-commerce in order to understand how different countries are coping with the challenges of fostering the digital economy. The participation of Cetic.br/NIC.br in these high-level dialogues was focused on the exchange of the most recent experiences with measuring e-commerce and also on publicizing the Center’s work, aiming at new partnerships.



▷ Working Party on ICT Indicators for Measurement and Analysis of the Digital Economy (WPMMADE), Organisation for Economic Co-operation and Development (OECD)

May and November 2019 – Paris (France)

Cetic.br/NIC.br has been an active participant in the OECD Working Party on Measurement and Analysis of the Digital Economy (WP-MADE). This working party is aimed at sharing experiences with measuring the digital economy, including tools and methodologies to produce relevant data for public policymaking. Participants in the WP-MADE are OECD member countries and invited experts. It is also the stage for the debate about the socioeconomic impacts of new disruptive technologies in the digital economy and their contribution to economic growth and well-being.

In 2019, WP-MADE met in May and November. In the first meeting, experts discussed issues related to the following topics: implementation of the *Going Digital Project* and the *Going Digital Toolkit*; measuring the digital transformation and

the roadmap for the future; key concepts and definitions of artificial intelligence and aspects of measuring its diffusion in business; measuring trust in the digital economy; and using the Internet as a data-source to measure the digital transformation, among others. Cetic.br/NIC.br presented the pilot project on measuring e-commerce activities based on web scraping techniques on company webpages. In the second meeting, experts discussed issues related to the following topics: measuring cloud services; digital supply-side tables; measuring the Internet of Things; well-being and the digital transformation; ICT usage surveys; and issues related to underreporting in Internet user statistics. Regarding this last topic, Cetic.br/NIC.br presented evidence from multiple countries related to this phenomenon.

▷ The Expert Group on ICT Household Indicators (EGH) and the Expert Group on Telecom/ICT Indicators (EGTI), International Telecommunication Union (ITU)

September 2019 – Geneva (Switzerland)

The mission of both EGH and EGTI, which are led by the International Telecommunication Union (ITU), is to bring together representatives from various countries to discuss ICT indicators to measure ICT supply and demand, based on the methodological framework developed by

the ITU. The expert groups share experiences through an online forum, and also meet in person once a year.

The EGH and EGTI group meetings are open to ITU members, targeting those responsible for ICT statistics who are working in ministries, regulatory agencies,

and national statistical institutes. The seventh face-to-face EGH meeting occurred back-to-back with the tenth EGTI meeting, with the participation of 124 professionals from 50 countries, ITU-Development sector members, and other UN agencies and regional organizations.

The agenda of the meeting relative to indicators on the supply side of ICT included the following topics: quality of service indicators; fixed broadband Internet traffic indicators; international roaming indicators; price indicators; and spectrum indicators. In addition, the expert group

discussed the revision of the *Handbook on Telecommunication/ICT Indicators*. The EGH agenda on the demand side focused on the methodological debate about improving the measurements for ICT skills and Internet users. Cetic.br/NIC.br chaired the EGH subgroup on improving the measurement of Internet users throughout the year. The expert group also discussed the revision of the *Manual for Measuring ICT Access and Use by Households and Individuals*, and the model household ICT questionnaire. There were also two joint EGTI/EGH sessions on exploring measures of online connectivity and measuring 5G.

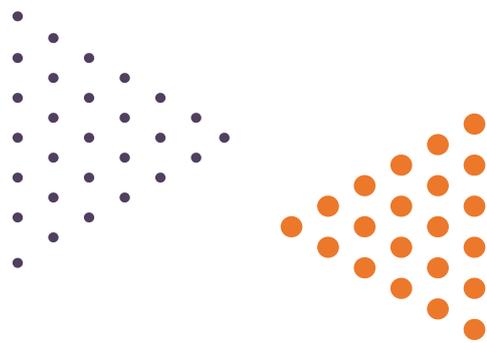


▶ Expert Group for the Review of the OECD Recommendation on the Protection of Children Online

October 2019 – Paris (France)

As part of the review of the implementation of the 2012 Recommendation of the OECD Council on the Protection of Children Online, a multistakeholder expert group that includes the participation of Cetic.br/NIC.br was established by OECD to guide this work. A first consultation of the expert group was held in Zurich in October 2018. Based on the outcomes of the

analytical work and the Zurich consultation, delegates agreed in November 2018 that the Recommendation needed updating. In 2019, OECD organized a second consultation with experts to present and exchange views on relevant national and international developments in previously identified priority areas, and discuss proposed revisions.



▷ Workshop on New Technologies and Alternative Methods for Measurement

November 2019 – Rio de Janeiro (Brazil)

This workshop was jointly organized by the Brazilian Institute of Geography and Statistics (IBGE) and the Federation of Industries of Rio de Janeiro (FIRJAN). It was aimed at discussing the challenges of measuring new digital technologies and their impact on the Brazilian economy. It was also an opportunity for sharing initiatives related to new technologies for measurement, new potential instruments for data collection, and mapping the data needs for policymaking.

Cetic.br/NIC.br presented its current efforts to innovate in the field of data collection, highlighting the adoption of the questionnaires developed by the statistical office of the European Union (EUROSTAT) related to the adoption of new disruptive technologies, and the methodological decision to create a new electronic commerce module in the ICT Enterprises 2019 survey.

▷ Gender, Science, Technology and Innovation: Strategic Knowledge for Human and Sustainable Development

November 2019 – Buenos Aires (Argentina)

Organized by the Regional Chair of UNESCO Mujer, Ciencia y Tecnología en América Latina (Women, Science and Technology in Latin America), with the support of GenderInSITE, and sponsored by the Organization of Iberoamerican States (OEI), the conference on Gender, Science, Technology and Innovation: Strategic Knowledge for Human and Sustainable Development provided an opportunity for dialogue about gender, science and technology. Under the premise of gender equality in science, technology and innovation as an indispensable condition for building a more just, inclusive and sustainable future, the program included presentation of publications, research and actions from different locations and areas.

Cetic.br/NIC.br participated in the panel "Gender Analysis of Access to and Use of ICT

in Childhood." This panel was moderated by Florence Raes (UN Women Argentina), and presented results of recent research on children, gender and ICT. The participants were Carolina Duek (CONICET / National University of Buenos Aires), Sebastián Benítez Larghi (CONICET / National University of La Plata), Blas Fernández (Latin American School of Social Sciences - FLACSO - Argentina) and Javiera Macaya (Cetic.br/NIC.br).

On this occasion, the publication *Children, Adolescents and the Use of the Internet in São Paulo and Buenos Aires: Studies from a Gender Equality Perspective* was announced. This publication is the result of cooperation between Cetic.br/NIC.br and the Latin American School of Social Sciences (FLACSO)/ UNESCO Regional Chair on Women, Society & Technologies.



▶ EQUALS Global Partnership Research Group Meeting

December 2019 – Daejeon (South Korea)

The second meeting of the EQUALS Global Partnership Research Group was hosted by the Korea Advanced Institute of Science and Technology (KAIST) in Daejeon, South Korea. Cetic.br/NIC.br has been a member of the group since 2017, and was invited to contribute to discussions about future projects and partnerships.

The group was established to ensure an evidence-based approach to the activities of EQUALS – a global partnership formed between ITU and UN Women to promote

gender equality in ICT access, skills and leadership – to track progress toward the initiative’s targets, and to generate and disseminate knowledge globally to address gender inequalities in science and technology. In addition to hosting the EQUALS Research Group meeting, on December 4, KAIST held the 1st Annual Conference on AI Fairness under the theme “AI and Gender”; the thematic axes were: gender bias in AI; gendered society, and gendered AI and AI fairness.

▶ First Meeting of the Working Group on Measuring E-commerce and the Digital Economy at UNCTAD

December 2019 – Geneva (Switzerland)

The first meeting of this working group was organized by UNCTAD. Experts from several countries were invited to comment on and help to revise the *Manual for the Production of Statistics on the Information Economy*.

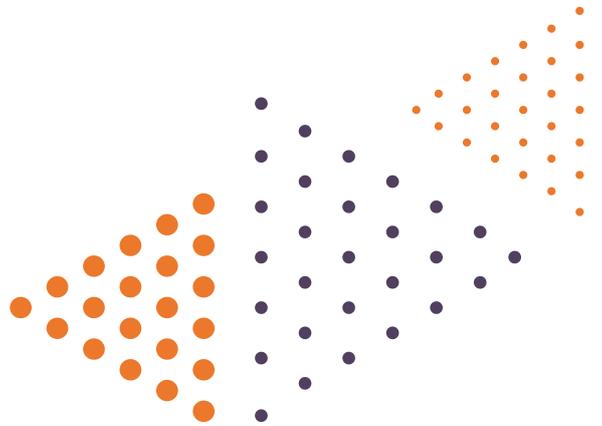
Cetic.br/NIC.br was appointed by the Brazilian government to present its experience with measuring electronic commerce and the digital economy, specifically the adaptation process of the most recent EUROSTAT standard questionnaires. Cetic.br/NIC.br also presented its cognitive testing methodology, and quality management process for pretesting and field data collection.





Cooperation Network

In 2019, Cetic.br/NIC.br strengthened its cooperation efforts with regional collaboration networks to stimulate exchange of knowledge, sharing of common frameworks for ICT data collection, and regional comparability of indicators and comparative analyses.



▶ ICT and Children

▶ Kids Online Networks

Cetic.br/NIC.br has maintained a close dialogue with international networks that investigate the use of the Internet by children. Currently, Cetic.br/NIC.br is part of the Global Kids Online project, developed as a collaborative initiative by the UNICEF Office of Research-Innocenti, the London School of Economics and Political Science (LSE), and the EU Kids Online network. It aims to connect evidence with the ongoing international dialogue regarding policies and practical solutions for children's well-being and rights in the digital age, especially in the Global South. The ICT Kids Online survey, carried out in Brazil since 2012 by Cetic.br/NIC.br, is the result of the Center's pioneering collaboration with the EU Kids Online network, which enabled adaptation of the methodological framework to Brazil, and then by other countries in the Latin American region. In 2019, Cetic.br/NIC.br engaged in the debates on the International Convention on the Rights of the Child in the context of access to and use of ICT and collaborated to harmonize the international databases used for the production of the report, *Growing Up in a Connected World*. This report, developed by UNICEF with support from Cetic.br/NIC.br, systematizes evidence from national Global

Kids Online surveys in 11 countries. The public activities developed by the networks include:

▶ April 2019:

Participation in the panel "Digital Citizenship and Skills for the 21st Century." It was organized by UNECLAC, UNICEF Children in Latin America and the Caribbean (LACRO) and Red Kids Online Latin America and held in Santiago, Chile. The panel was the result of the effort of a network of researchers, civil society organizations and international organizations, and the objective was to promote research and evidence-based discussion of digital public policies aimed at children and adolescents that are necessary in the region, to guarantee that "no one is left behind" in the process of developing an increasingly digitized society.

Speakers: Daniela Trucco (ECLAC), Fabio Senne (Cetic.br/NIC.br), Patricio Cabello (University of San Sebastián-Kids Online Chile), Matías Dodel, (Catholic University of Uruguay-Kids Online Uruguay), Elsie Finseth (Growing up in Red-Kids Online Peru), María Jesús Jaque (National Deputy Director of National Institute of Youth -INJUV of Chile), María Rosa Suarez (Technical Director of the Social Policy Coordination Cabinet, Dominican Republic).

► May 2019:

Cetic.br participated in the Global Kids Online network meeting that took place on May 28-30 at the UNICEF Innocenti office in Florence, Italy. Presentations at the meeting sessions addressed new research from partner countries of Global Kids Online; presentation of the full draft of the Global Kids Online Report¹⁶; insights from the Global Kids Online impact assessment; and new research initiatives on children and digital technology by UNICEF, LSE and other partners in the global network.

► June 2019:

Participation in the symposium Growing up with the Internet: Types of Use and Parental Mediation in Children and Adolescents in Four Latin American Countries, which was part of the V Latin American Regional Conference, with the theme of "Building Bridges among Diversity." The conference, organized by the International Association for Cross-Cultural Psychology (IACCP) and the University of Costa Rica, took place in San José, Costa Rica, in June 2019. In addition to presenting new visions based on the comparative analysis of parental mediation of children's Internet use, the Latin American Kids Online Network held a meeting to plan the activities to be carried out in 2020, including the launch of the report Childhood and Adolescents in the

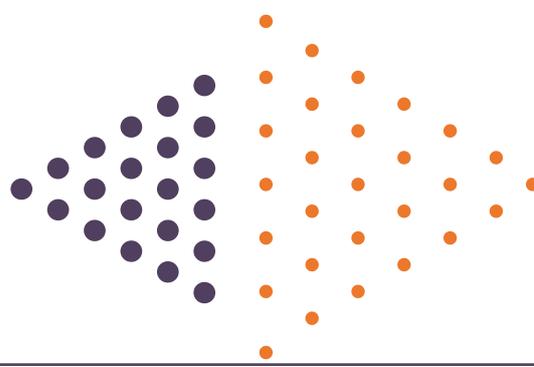
Digital Age, which presents comparative analysis of the results of the Kids Online surveys carried out in Brazil, Chile, Costa Rica and Uruguay.

► November 2019:

Session "Kids Online: What We Know and Can Do to Keep Them Safe." It was organized by Cetic.br/NIC.br at the Internet Governance Forum (IGF) held in Berlin, Germany. The session also presented advances from the European Kids online report, and from the Latin American Kids Online comparative report, coordinated by ECLAC with the support of Cetic.br/NIC.br, both to be published early in 2020. The session focused on the main results from the most recent comparative reports based on Kids Online research around the world, and also debated the implications of those data for policymaking and for guaranteeing children's rights. Participants in the session included Sonia Livingstone (LSE), Daniel Kardefelt-Winther (UNICEF - Innocenti), Daniela Trucco (ECLAC), Cristina Ponte (Faculty of Social and Human Sciences – FCHS- of New University of Lisbon - NOVA), Amanda Third (University of Western Sydney, Australia), Su Wenying (UNICEF, China) Guilherme Canela (UNESCO, Montevideo Regional Office) and Alejandra Erramuspe (Agency for the Development of Electronic Government and Information Society and Knowledge - AGESIC in Uruguay).



¹⁶ globalkidsonline.net/synthesis-report-2019



▶ ICT and Health

▶ **Methodological Guide: Measurement of Digital Health: Methodological Recommendations and Case Studies**

During the 9th NIC.br Annual Workshop on Survey Methodology, in April 2019, the publication *Measurement of Digital Health: Methodological Recommendations and Case Studies* was launched. The publication, available in three languages - Portuguese, English and Spanish – is the result of a joint effort by Cetic.br/NIC.br and the Pan American Health Organization (PAHO/WHO). With the goal of facilitating the production of statistics on the adoption, use and appropriation of information and communication technologies (ICT) in the health sector, this publication helps guide public managers, academic researchers, enterprises in the private sector, and representatives of civil society in various countries to measure their progress in the sector.

In *Measurement of Digital Health*, readers will find details about each of the steps necessary to carry out a survey on ICT access, use, and appropriation in the health sector. It also provides information about best practices, based on the first nationwide measurement effort developed in Latin America, the ICT in Health survey, carried out by Cetic.br/NIC.br, and conducted later in Uruguay. The publication also dedicates a chapter to addressing the adoption of an integrated model that goes beyond statistics on access and use, including effects (associated with investment in

ICT and the development of capabilities), results (improvements in efficiency, quality and access), and impacts (centered on the challenges of each country's health system).

The publication is organized in six chapters, and brings together an international perspective, case studies and a vision of the future regarding the measurement of digital health. Versions in Spanish, Portuguese and English are available for download¹⁷.



▶ **Joint Brazil – Uruguay Technical Working Meeting on Digital Health: Contributing to Equity in Health**

As part of cooperation with AGESIC in the field of ICT in health, this joint technical meeting was held in September 2019 in Montevideo to plan future cooperation activities in 2020 and to discuss the results of the report on the ICT Health survey carried out within the framework of Uruguay's Salud.uy. During this meeting, Cetic.br/NIC.br presented the methodological guide: *Measurement of Digital Health: Methodological Recommendations and Case Studies*.

¹⁷ **Spanish:** cetic.br/en/publicacao/medicion-de-la-salud-digital-recomendaciones-metodologicas-y-estudios-de-caso

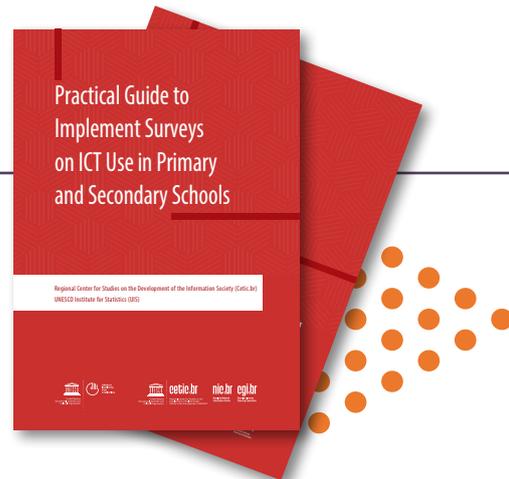
Portuguese: cetic.br/en/publicacao/medicao-da-saude-digital-recomendacoes-metodologicas-e-estudos-de-caso

English: cetic.br/publicacao/measurement-of-digital-health-methodological-recommendations-and-case-studies

▶ ICT and Education

▶ Practical Guide for Implementing Surveys on ICT Use in Primary and Secondary Schools

Cetic.br/NIC.br and the UNESCO Institute for Statistics (UIS) joined together to develop a methodological framework for the production of comparable statistics on the usage and adoption of ICT in educational institutions, after receiving input from international experts from all five continents. The second draft of the Guide was presented and discussed in an expert group meeting during the High-Level Political Forum on Sustainable Development (HLPF),



which took place in 2019 in New York. The Guide addresses critical aspects of collecting data on ICT in education and serves as a conceptual and methodological reference for the design and implementation of ICT surveys in schools. The publication was finished in December 2019 and will be launched in April 2020.

▶ Alliance for the Digitalization of Education in Latin America (ADELA)



ADELA is a community of researchers and policymakers in Latin America that promotes informed debate, and carries out projects to support policies in digital education, generating knowledge to promote the development of more inclusive, equitable and quality education through digital tools. In 2019, Cetic.br/NIC.br continued to cooperate in

ADELA's activities, which seek to address the challenges associated with the 4th Industrial Revolution and its social implications for the region, mainly focusing on the following key areas: 21st century skills and Science, Technology, Engineering, and Math (STEM); impact evaluation in digital education; teacher professional development (DPD) and gender.



▶ ICT and Government

Cetic.br/NIC.br has a long track record in measuring electronic government through national surveys that include individuals, enterprises and governments. In the Brazilian context, Cetic.br/NIC.br cooperates with the Ministry of Economy by providing statistics on access to and use of e-government services, supporting the monitoring of actions and policies of the national Digital Governance Strategy.

In 2019, Cetic.br/NIC.br, along with UNESCO and AGESIC, co-organized an invited session at the 12th International Conference on Theory and Practice of Electronic Governance (ICEGOV), which took place in Melbourne, Australia in April. Cetic.br/NIC.br brought together policymakers

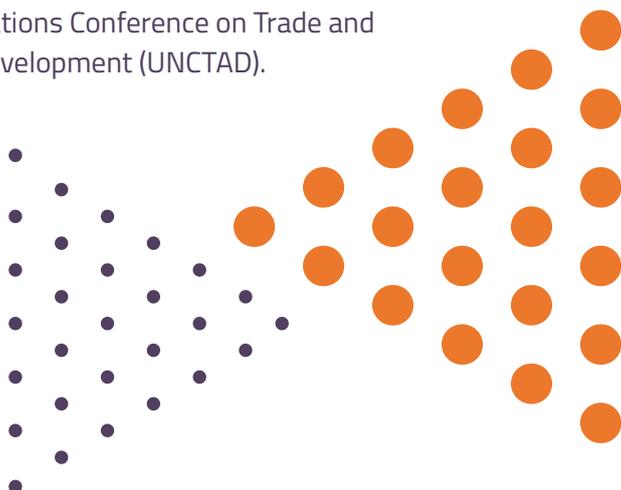
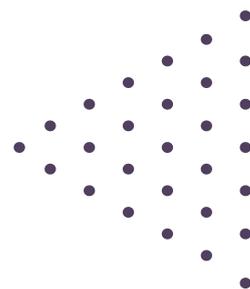
and experts from countries in the Latin American region to debate the challenges of measuring progress toward achieving the sustainable development goals (SDGs) within the scope of digital government. Strategies for measuring the SDGs with regard to the use of technologies by the public sector were discussed by representatives from Brazil, El Salvador, Panama and Uruguay. The session also featured aspects of digital government indicators presented by representatives of UNESCO, the United Nations Department for Economic and Social Affairs (UNDESA) and the Network of e-Government Leaders of Latin America and the Caribbean (Red GEALC).

▶ Webinars: ICT Indicators Working Group (Statistical Conference of the Americas UN ECLAC)

In the framework of the Biennial Plan of Activities 2018-2019 of the ICT Indicators Working Group, and with the purpose of sharing experiences and practical skills to contribute to the development of capacities, Cetic.br/NIC.br delivered two webinars:

▶ **1.** A webinar on “Measuring ICT in Households” was held on May 29 and featured Nicolás Kunich, from the National Institute of Statistics (INE) of Uruguay, who presented the experiences of INE, followed by Winston Oyadomari and Ana Laura Martínez, from Cetic.br/NIC.br, who presented the Center’s experiences in measuring access to and use of ICT in households and by individuals.

▶ **2.** A Webinar on “Measuring ICT in Enterprises” was held on July 17. The program included the participation of Leonardo Lins, from Cetic.br/NIC.br, who presented the Center’s experiences in measuring access to and use of ICT in enterprises, and José Luis Cervera, from DevStat.com, who presented the ICT module for companies of the United Nations Conference on Trade and Development (UNCTAD).





Dialogue with Stakeholders

ICT as a key cross-cutting technology that impacts multiple sectors requires the involvement of multiple and diverse stakeholders in the development of information and knowledge societies. Dialogue among these stakeholders can be established in many ways: cooperation agreements between institutions; sharing microdata bases; participation in forums and discussion groups; and meetings to present the indicators produced by the Center. In 2019, there were 16 ongoing cooperation agreements and signed with government

and international organizations, which, in addition to consolidating long-term cooperation and strengthening the Center's relationships with these organizations, allow the establishment of joint activities, and the sharing of experiences, data and methodologies among institutions.

Next, we present important actions carried out by the Center in 2019 that allowed for closer ties with multiple and diverse stakeholders throughout the year, reinforcing its commitment to the dissemination of information and knowledge.

▶ Multi-Participative Process: Contributions from Different Sectors of Society

The process for the production of the surveys carried out by Cetic.br/NIC.br is based on a multistakeholder model, encompassing a group of over 240 experts from different sectors of society such as government (ministries, regulators, public organizations and national statistical offices), academia and research institutes, international organizations, and civil society. These experts contribute to the methodological definition and the data analysis process for the ICT surveys produced by the

Center, meeting on a regular basis to validate the indicators and the survey methodology, and to define the data analysis guidelines. This group's collaboration is essential to identifying new fields of research, refining methodological procedures, promoting the transparency of the process, and accomplishing the production of robust and reliable data. In 2019, the Center held 7 expert meetings to discuss and improve the national ICT surveys.

▶ Data for Policymaking

Cetic.br/NIC.br cooperates in several areas of public administration, such as digital inclusion, education, health, and culture, among others, to produce relevant data for monitoring and evaluating policies. Over the last few years, the Center has been engaged in the debate on the ICT policy agenda of the Brazilian government, including the federal government, states and local municipalities.

In order to meet the increasing demand for more disaggregated ICT statistics by federative units to be used in policy design,

Cetic.br/NIC.br has striven to develop new survey design and data analysis techniques. Disaggregation by federative units has been made available for the ICT Households survey for both units of analysis – households and individuals – using small sample estimation. Sample design is under revision to increase the level of disaggregation of the surveys on e-government, education and health.

Table 2 shows the main areas of interaction with the federal government to support implementation of ICT policies:

TABLE 2 - DATA FOR ICT POLICIES

POLICY DIMENSION	DESCRIPTION
DIGITAL ECONOMY	OECD Review of Digital Transformation: Going Digital in Brazil and OECD Telecommunication and Broadcasting Review of Brazil: Cetic.br/NIC.br provided indicators to support the implementation of OECD Country Reviews in the field of digital transformation and telecommunication.
DIGITAL GOVERNMENT	Digital Governance Strategy (EGD): The EGD defines the strategic objectives, goals, indicators and initiatives of the Digital Governance Policy of the Federal Executive Branch, instituted in January 2016. Among the indicators monitored by the strategy are the proportion of individuals that used electronic government services in the last 12 months (ICT Households survey) and the proportion of federal government organizations that made online public consultations available in the last 12 months (ICT Electronic Government survey).
HEALTH	Digital Health Action, Monitoring And Evaluation Plan For Brazil (PAM&A): Participation in the Technical Group created by the Ministry of Health. This strategy relies on the collaboration of specialists from public and private organizations for the construction of an action plan for the expansion of digital health with a focus on primary care. Through various workshops and meetings, the plan's priorities and goals were defined, and indicators were proposed for monitoring and evaluating the advancement of digital health in Brazil.
EDUCATION	Connected Education Innovation Program (PIEC): In 2019, Cetic.br/NIC.br and the Center of Study and Research in Network Technology and Operations (CEPTRO.br) worked together with the Ministry of Education and the Lemann Foundation to disseminate the data generated by the Connected Education Measurement System among public managers. In October, more than 10,000 schools had already installed the Connected Education Measurement System, allowing real-time mapping of Internet quality at schools in different regions of the country. Given the relevance of the Connected Education Measurement System and the ICT in Education survey for monitoring the implementation of public policies for technologies in Brazilian schools, Cetic.br and Ceptro.br were invited to participate in the Broadband Commission Working Group on School Connectivity, implemented by ITU together with UNESCO and UNICEF, whose objective is to boost the offer of connectivity in schools, with regard to both Internet access and the development of digital skills among students.
DIGITAL INCLUSION	ICT Public Access Centers survey: Cetic.br/NIC.br implemented a survey to investigate the contribution of Brazilian federal government public policies to digital inclusion, especially in telecenters registered in programs at this level of government. The survey had the institutional support of the Department of Digital Inclusion (DEID) of MCTIC, which contributed at all stages of the survey, providing a list of the telecenters that received any type of support from the federal government, constructing the questionnaire, and analyzing and validating the results.

▷ Multi-Participative Process: Contributions from Different Sectors of Society

In 2019, Cetic.br/NIC.br participated in several activities organized by major private sector companies, which are increasingly relevant stakeholders in discussions about the socioeconomic and cultural implications of ICT.

Cetic.br/NIC.br participated in a meeting sponsored by Facebook to discuss their Community Standards and the creation of an Oversight Board, which was to be launched in 2020. The meeting took place on May 15 and 16 in Mexico City and was attended by sector leaders from the Americas region who specialize in free speech, Internet governance, human rights and technology, media, and digital rights.

The Center also participated in a roundtable, sponsored by Facebook and Google, with Kristelle Lavalée, who is a researcher at the Center on Media and Child Health (CMCH) at Boston Children's Hospital (Harvard Medical School). The meeting took place on November 11 and was attended by

a group of national experts from different sectors focused on childhood and technology.

On November 12, Cetic.br/NIC.br participated in Facebook's Latam Safety Summit, a day of collaborative debates and workshops bringing together organizations and specialists from the Americas region who deal with different aspects of safety and online well-being, with a special focus on the protection of children, youths and women.

In 2019, Cetic.br/NIC.br was invited to join the Expert Review Committee (ERC) of the World Benchmarking Alliance (WBA) to contribute to the development of a benchmarking methodology to define the Digital Inclusion Benchmark (DIB). Considering that the private sector plays a crucial role in advancing toward sustainable development, this index will assess and compare how ICT companies are collaborating to ensure that benefits from digital technologies are contributing to the achievement of all SDGs.





Producing Knowledge about ICT

The production and sharing of knowledge about themes related to information and knowledge societies is one of the most important lines of action of Cetic.br/NIC.br. In 2019, Cetic.br/NIC.br actively participated in several academic discussion forums, including presenting

survey results and data analyses, debating methodological challenges, promoting thematic discussions, and proposing discussion panels with important stakeholders. Relevant events in which the Center participated in 2019 to present and share what the Center is producing are listed below.

▶ Culture and Technologies

▶ X International Seminar on Cultural Policies. Panel: "Internet and Cultural Activities: What are the Habits of the Brazilian Population?" Rio de Janeiro (Rio de Janeiro State, Brazil) May 2019.

▶ XV ENECULT - Multidisciplinary Studies in Culture Meeting. Workgroup on Digital Culture. Salvador (Bahia State, Brazil) July – August 2019.

▶ Digital Culture Management Course. Research and Training Center of Brazilian Social Service of Commerce – CPF - Sesc. São Paulo (São Paulo State, Brazil) August 2019.

▶ III International Seminar of the UNESCO Chair on Cultural Policies and Management - Casa de Rui Barbosa Foundation. Roundtable: "Culture and Diversity for Human Development: Digital Dilemmas." Rio de Janeiro (Rio de Janeiro State, Brazil) November 2019.

▶ Sesc Cultural Management Course. Research and Training Center of Brazilian Social Service of Commerce – CPF - Sesc. São Paulo (São Paulo State, Brazil) December 2019.

▶ Children and Technologies

▶ Participation in a conference on Safer Internet Day in São Paulo (São Paulo State, Brazil) February 2019.

▶ Participation in the IV International Seminar on the Use of Information and Communication Technologies by Children and Adolescents / Youth and Adults – E.S.S.E Mundo Digital, IV National Seminar on Technology and Human Dignity. Curitiba (Paraná State, Brazil) May 2019.

▶ Participation in the panel "YouTube for Children: Basic Manual for Adults" during Festival Path, the largest festival of innovation and creativity held in the country, São Paulo (São Paulo State, Brazil) June 2019.

▶ Lecture at the Week of Mobilization and Awareness about Dangerous Play, in Fortaleza (Ceará State, Brazil) June 2019.

▶ Education and Technologies

- ▶ II International Symposium on Subjectivity and Digital Culture. Offered jointly by Pontifical Catholic University of Minas Gerais and Federal University of Minas Gerais. Roundtable: "ICT and Education: Challenges and Innovations." Belo Horizonte (Minas Gerais State, Brazil) May 2019.
- ▶ Webinars Co(i)ncidir. "Webinar on Building Digital Citizenship in the Network." The Research and Intervention Network for Literacy and Digital Inclusion (Rede ObLID). Portuguese Open University (Portugal) June 2019.
- ▶ 3rd International Congress on Journalism and Education. Workshop: "Media Education - The Role of Education in Combating Fake News. Brazilian Association of Education Journalists - JEDUCA. São Paulo (São Paulo State, Brazil) August 2019.
- ▶ 4th National Seminar Connected Education. Panel: "Measurement of Connectivity in Brazilian Public Schools." Ministry of Education. Recife (Pernambuco State, Brazil) August 2019.
- ▶ Dialogues Debate Series. Workshop: "ICT in Education: Access, Use and Appropriation of Technologies in Primary Schools." Roberto Marinho Foundation. Rio de Janeiro (Rio de Janeiro State, Brazil) September 2019.
- ▶ Virtual Training Program in Digital Policies. Webinar: "Learning and Teaching in Digital Culture." UNESCO International Institute for Educational Planning – IIEP UNESCO. Buenos Aires (Argentina) September 2019.
- ▶ XXVII Pedagogy Week. Roundtable: "New Technologies in Education." Mackenzie Presbyterian University Institute. São Paulo (São Paulo State, Brazil) September 2019.
- ▶ 25th ABED International Distance Education Congress. Plenary Session: "Technologies and Learning in Brazil: Overcoming Challenges to Create Opportunities." Brazilian Association of Distance Education (ABED). Poços de Caldas (Minas Gerais State, Brazil) October 2019.
- ▶ VI Web Curriculum Seminar. Roundtable: "Digital Culture, Participation and Democracy." Pontifical Catholic University of São Paulo (PUC-SP). São Paulo (São Paulo State, Brazil) November 2019.

▶ Health and Technologies

- ▶ 30th SASE Meeting (Society for the Advancement of Socioeconomics). Presentation: "Public Policies for Digital Transformation in Brazil: Challenges and Achievements." The New School for Social Research, New York City (NY, USA) June 2019.
- ▶ Workshop in the specialization course in Health Informatics from the Sírio Libanes Hospital. The course was directed to representatives of the state health departments. Presentation: "Methodology and results of the ICT in Health survey." São Paulo (São Paulo State, Brazil) April 2019 / October 2019.
- ▶ 16th Congress of the Brazilian Association for Labor Studies (ABET). Presentation: "Impacts of the Implementation of Electronic Health Systems. Federal University of Bahia (UFBA). Salvador (Bahia State, Brazil) September 2019.
- ▶ Workshop by the National Council of Municipal Health Secretaries (CONASEMS). Presentation: "Main Results of the ICT in Health survey." Brasília (Federal District, Brazil) October 2019.

▶ E-Government

- ▶ Expert Group Meeting: Technology in Portuguese Healthcare Facilities. United Nations University Operating Unit on Policy-Driven Electronic Governance (UNU-EGOV). Guimarães (Portugal) February 2019.
- ▶ 12th International Conference on Theory and Practice of Electronic Governance (ICEGOV). Invited session: "Digital Government and the 2030 SDGs: Collaborative Efforts to Measure ICT indicators in Latin America and the Caribbean". RMIT University. Melbourne (Australia) April 2019.
- ▶ Workshop for the formulation of the new Digital Government Strategy of the Federal Government. Presentation: "ICT e-Government Survey." National School of Public Administration (ENAP). Brasília (Federal District, Brazil) September 2019.
- ▶ Pontifical Catholic University of São Paulo. Democracy, Internet and Elections Meeting: Multidisciplinary Perspectives in Europe and Latin America. São Paulo (São Paulo State, Brazil) September 2019.
- ▶ II Congress of the National Institute of Science and Technology in Digital Democracy (INCTDD). Presentation: "Measurement, Internet and Participation: Challenges for the Brazilian Context". Federal University of Bahia (UFBA). Salvador (Bahia State, Brazil) October 2019.
- ▶ I Commercial Registries National Congress (CONAJ). Presentation: "ICT e-Government Survey." São Paulo (São Paulo State, Brazil). November 2019.
- ▶ 2nd Technical Meeting on the Brazilian Open Data Portal. São Paulo (São Paulo State, Brazil) November 2019.

▶ Households and Digital Inclusion

- ▶ 46th Meeting of Regional Providers organized by Bit Social. Presentation: "ICT ISP Providers Survey." Santos (São Paulo State, Brazil) February 2019.
- ▶ International Webinar on Tackling Digital Inequalities: Outcomes-Based Approaches and Methodological Innovation. Organized by From Digital Skills to Tangible Outcomes (DiSTO) February 2019.
- ▶ Technical Meeting on Digital Inclusion in Brazil. Presentation: "ICT Public Access Centers Survey." Ministry of Science, Technology, Innovation and Communication. Brasília (Distrito Federal, Brazil) September 2019.

▶ Survey Statistics and Methodological Events

▶ Conference on Current Trends in Survey Statistics. Institute for Mathematical Sciences, National University of Singapore, International Association for Survey Statisticians, International Statistical Institute. Singapore (Singapore) August 2019.

▶ 62nd ISI World Statistics Congress 2019. International Statistical Institute (ISI). Kuala Lumpur (Malaysia) August 2019.

▶ Symposium on Data Science & Official Statistics. UN Statistics Division/DESA and UN Economic and Social for Asia and the Pacific. Kuala Lumpur (Malaysia) August 2019.

▶ 3rd Advanced School on Big Data Analysis. Applied Mathematics and Computer Science Institute – University of São Paulo (ICMC/USP). São Carlos (São Paulo State, Brazil) September 2019.

▶ Paraíba Sampling Meeting - EPA 2019. Organized by the Statistics Department of the Federal University of Paraíba. Cetic.br/NIC.br made three presentations: an article entitled "Cetic.br: Innovative Projects in the Production and Dissemination of Public Statistics," and two oral presentations in thematic sessions: "Comparison of Estimation Methods in Small Areas for the Production of ICT Indicators for Federative Units in Brazil" and "Indicators of Sample Representativeness: an Application to the ICT Household Survey." João Pessoa (Paraíba State, Brazil) October 2019.





Publications

The production of high-quality statistical data to monitor access to and use and appropriation of ICT is a central activity developed by Cetic.br/NIC.br. The Center carries out a set of four annual ICT survey projects – related to households, education, health, children and adolescents – in addition to six biennially conducted surveys: enterprises, e-government, non-profit organizations, ISP providers and culture. These projects cover critical areas for monitoring the development of information and knowledge societies, while also generating relevant data for monitoring the sustainable development goals and targets defined by the United Nations (UN) in its 2030 Agenda for sustainable development.



INTERNET SECTOR OVERVIEW REPORT

The Internet Sectoral Overview Report explores themes related to access to and use of digital technologies in various sectors of society. The report explores relevant data and findings from the national ICT surveys conducted by Cetic.br/NIC.br.

COLLABORATORS

Year XI – Nr. 1: Mobile digital practices of older people in Brazil

Mireia Fernández-Ardèvol
(IN3/ Open University of Catalonia)
Sara Crofts (ONS UK)
Sandra Huenchuan (UNECLAC)

Year XI – Nr. 2: Privacy and personal data

Laura Schertel Mendes (UnB/IDP)
Bruno Bioni (Independent consultant)
Joana Varon (Coding Rights)

In 2019, four editions were published on the following topics: mobile digital practices of older people in Brazil; privacy and personal data; digital collections; and the stunning growth of e-waste volume and its global implications.

Year XI – Nr. 3: Digital collections

Dalton Lopes Martins (UnB)
Calíope Víctor Spíndola de Miranda Dias (UnB)
Ernesto Ottone (UNESCO)
Mariana Valente (InternetLab)

Year XI – Nr. 4: The Stunning growth of e-Waste Volume and its Global Implications

Vanessa Forti (United Nations University Vice Rectorate in Europe UNU-ViE)
Marcos Pimentel (CTI/MCTIC)
Ruth Minja (NBS)





NIC.BR SECTORAL STUDIES

The NIC.br Sectoral Studies series was launched in 2016 with the goal of discussing emerging themes relative to the interface between ICT and society. In 2019, the publication entitled *Digital Inequalities in Urban Space: A Study on Internet Use and Access in the City of São Paulo* was released in October during the Seminar on Mapping Digital Inequalities: New Methodologies and Evidence for Public Policies, which brought together experts around the debate on the current scenario of access to and use of the Internet in an urban space.

The study acknowledges that incorporation of information and communication technologies (ICT) in the lives of São Paulo residents has occurred unevenly in the various regions of the city. By performing a

disaggregated reading of indicators collected for the 32 subprefectures of the largest Brazilian metropolis and adopting an internationally recognized methodology, the study points out relationships between digital exclusion and social exclusion, which are more evident in subprefectures located in the most socioeconomically vulnerable regions.

In an unprecedented effort to analyze the dynamics of social and digital exclusion in the city of São Paulo, this publication received the support of the Brazilian Center for Analysis and Planning (CEBRAP) and the Center for Metropolitan Studies (CEM), and also received methodological support from the project DiSTO - From Digital Skills to Tangible Outcomes of the London School of Economics (LSE).

ICT HOUSEHOLDS 2018

Carried out annually since 2005, the ICT Households survey aims to measure ICT use in Brazilian households, individual access to computers and the Internet, and activities developed online, among other indicators.

In the 2018 edition, a revised module on e-commerce was implemented with the goal of better measuring e-commerce activities. The revisions took into consideration the new indicators established by the ITU and were completed after consulting the expert group supporting the project. The revised questions were submitted to a series of cognitive interviews to validate concepts and the precise understanding of the respondents. The survey carried out interviews with more than 23,000 households across all regions in Brazil, including rural areas. Since the 2015 edition, all of the ICT Households microdata bases and documentation have been available for download on Cetic.br's website.

ARTICLES PUBLISHED IN ICT HOUSEHOLDS 2018

Alignment of the ICT policies of the Brazilian Federal Government with the 2030 Agenda

Fernanda Hoffmann Lobato & Tânia Luisa Koltermann da Silva

Data Protection in the technological age: Regulation trends, privacy, and social impacts

Ana Lúcia Marcondes Faria De Oliveira & Viviane Ceolin Dallasta del Grossi

The field of the Internet: Online "cultural" uses and access

Frederico Augusto Barbosa da Silva & Paula Ziviani

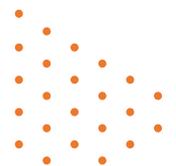
Appropriation of Facebook by women farmers who build agroecology and feminism in different Brazilian socioenvironmental contexts

Angélica Patrícia de Almeida & Márcio Simeone Henriques

The elderly and citizenship: A look at a construction mediated by new information and communication technologies

Claudimiro Lino de Araújo & Tiago Mainieri





ICT IN EDUCATION 2018

Carried out annually since 2010, the ICT in Education survey aims to investigate ICT access, use and appropriation in Brazilian public and private primary and secondary schools located in urban and rural areas. In 2018, the ICT in Education survey completed its 9th consecutive edition. Data collection was carried out in 1,125 schools located in urban areas, which were visited in person, and 1,433 schools located in rural areas, which were contacted by phone. A total of 15,308 schools' actors were interviewed, including principals, directors of studies, teachers and students. Three grades were studied in this survey: 5th year of Elementary Education; 9th year of Elementary Education; and 2nd year of Secondary Education.

ARTICLES PUBLISHED IN ICT IN EDUCATION 2018

Digital competence of teachers

Liane Margarida Rockenbach Tarouco

Media literacy in schools: Fighting online disinformation

Mariana Canto

Computational language and the need to rethink the curriculum

Luciana Santos Barbosa & Júlio César Martins dos Anjos Silva

Technologies in the curriculum for learning and sustainable development goals

Regina Célia Fortuna Broti Gavassa & Tânia Tadeu



ICT KIDS ONLINE BRAZIL 2018

The goal of the ICT Kids Online Brazil survey is to understand how the population 9 to 17 years old uses the Internet and how they deal with risks and opportunities related to its use. ICT Kids Online Brazil is aligned with the methodological framework of the EU Kids Online and Global Kids Online networks. In its seventh edition, the ICT Kids Online Brazil survey interviewed 2,964 children 9 to 17 years old and their parents or legal guardians across the country. Since the 2015 edition, the micro databases and documentation of the ICT Kids Online Brazil survey have been available for download on Cetic.br's website.

ARTICLES PUBLISHED IN ICT KIDS ONLINE BRAZIL 2018

It's been leaked, now what? Discussing nonconsensual image sharing: An analysis of the Caretas Project

Gabriela Goulart Mora & Janara Sousa

Exposure to sensitive suicide content: Lessons learned from the Blue Whale and Momo cases

Juliana Cunha & Rodrigo Nejm

The processing of personal data of children and adolescents: Protection and consent

Chiara Spadaccini de Tefé

Social networks and mental health indicators in ICT Kids Online Brazil surveys (2013 – 2017)

Ivelise Fortim & Mateus Donia Martinez

A comparative analysis of the digital skills of children in Brazil and Uruguay

Cecilia Hughes & Emiliano Pereiro



ICT IN CULTURE 2018

The ICT in Culture survey investigates the presence of ICT infrastructure and the use of these technologies in Brazilian cultural facilities, focusing on internal management, public relations, and collection digitization. It also presents information about IT management in these institutions and the perceptions of the contributions and challenges of computer and Internet use in cultural facilities.

In its second edition, the survey approached 5,899 institutions, reaching a final sample of 3,065 cultural facilities, including archives, heritage sites, libraries, cinemas, museums, culture points, and theaters.

ARTICLES PUBLISHED IN ICT IN CULTURE 2018

Do online activities reduce or encourage access to offline cultural activities? What do quantitative studies suggest?

João Leiva & Ricardo Meirelles

Enjoyment on digital media: Connectivity for accessing cultural diversity

Viviane Riegel, Joana Pellerano, Renato Vercesi Mader & Wilson Roberto Bekesas

Collection Digitization: Preserving memory in the face of copyrightst

Juliana Novaes

The Tainacan Project: Experiments, lessons and discoveries relative to digital culture in the universe of memory institution collections

Dalton Lopes Martins, José Murilo Costa Carvalho Júnior & Leonardo Germani

Funding culture through the application of ICT: The BNDES culture matchfunding program

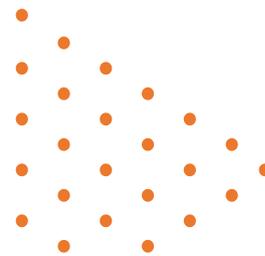
Patricia Zendron, Eduardo Bizzo de Pinho Borges, Maria Araujo Parreiras & Vitor Straub de Moraes



ICT PROVIDERS 2017

The goal of the ICT Providers survey is to carry out a census of Internet service providers (ISPs) to construct a National Register of Providers that maps out the context of the Internet access provision market in

the country. In the 2017 edition, the survey was carried out with a group of Internet service providers with declared connections records between January and May 2017. Of these, 2,177 providers responded to the survey.



ICT IN HEALTH 2018

Carried out since 2013, the overall goal of the ICT in Health survey is to understand the stage of ICT adoption in Brazilian healthcare facilities and their appropriation by healthcare professionals (physicians and nurses). In its sixth edition, the survey interviewed 2,387 healthcare facility managers across the country, in addition to 1,697 physicians and 2,716 nurses affiliated with these facilities.

ARTICLES PUBLISHED IN ICT IN HEALTH 2018

E-SUS Primary Care strategy: The Brazilian digital transformation

Allan Nuno Sousa, Ana Claudia Cielo, Igor de Carvalho Gomes, João Geraldo de Oliveira Junior & Mara Lucia do Santos Costa

Citizens as health informatics consumers

Heimar de F. Marin

ICT in Health survey and the design of public policies for the Brazilian E-health strategy

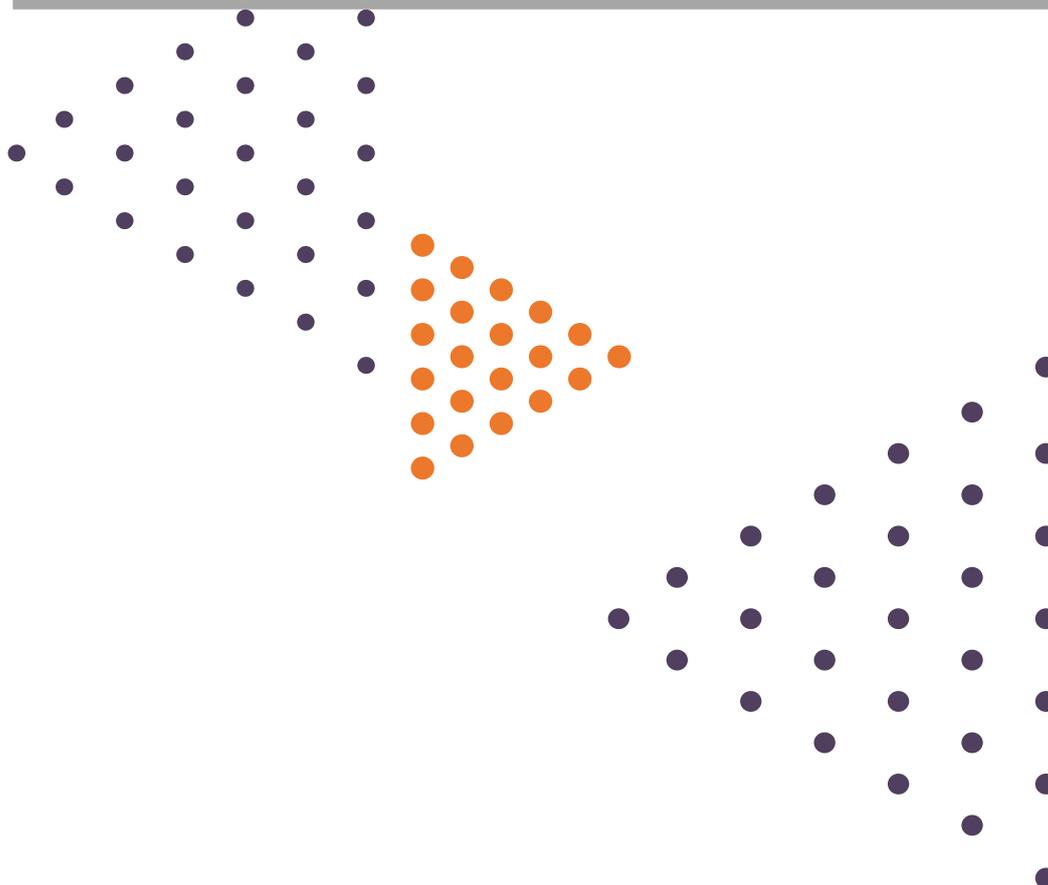
Juliana P. Souza-Zinader & Heimar F. Marin

State of data protection in the healthcare field

Luis Gustavo Kiatake & Lilian Pricola

Hospital activity trends in the French activity-based financing context: An international perspective

Angel-Benitez Collante & Patrice Degoulet



▷ Other ICT Survey Projects



ICT ENTERPRISES

Published annually since 2005, the ICT Enterprises survey aims to measure the presence of ICT in enterprises with 10 or more employed persons with the

goal of investigating access to infrastructure, as well as use and appropriation by the private sector of new technologies, mapping their perceptions of associated benefits.



ICT ELECTRONIC GOVERNMENT

Since 2013, the ICT Electronic Government survey has investigated the supply of e-government services in Brazil. The use of ICT in the public sector can increase access to public services, making governments more transparent, in addition to enabling citizen participation. With the aim of

analyzing this scenario, interviews are conducted with ICT managers and people responsible for the digital content of governmental organizations at the three levels of government (federal, state and local), the executive, legislative and judicial branches, and the public prosecutor's office.



ICT NONPROFIT ORGANIZATIONS

The ICT Nonprofit Organizations survey explores the presence and use of ICT in Brazilian nonprofit

organizations, in addition to mapping out characteristics and accumulated ICT skills in the facilities.



ICT PUBLIC ACCESS CENTERS

The ICT Public Access Centers survey investigates the contribution of telecenters to digital inclusion in Brazil, focusing on the contribution of public

policies for digital inclusion, in particular telecenters registered in the Electronic Government programs - GESAC, Telecentros.BR and Community Telecenters.

PUBLISHED PAPERS

Lima, L. P. B. (2019). Práticas culturais online e plataformas digitais: desafios para a diversidade cultural na Internet. *Proceedings of Anais XV ENECULT - Encontro de Estudos Multidisciplinares em Cultura*.

Portilho, L., & Lima, C. R. (2019). Impactos da implantação de sistemas eletrônicos de saúde sobre o trabalho de médicos e enfermeiros. *Proceedings of Anais XVI Congresso Nacional da ABET*.

Siqueira, E., Souza, C. A., & Barbosa, A. F. (2019). Using a digital divide index among enterprises in the context of public policies in Brazil. *Electronic Journal of Information Systems in Developing Countries*, 85(3).

PRESENTED PAPERS

Portilho, L., Melo, L., Maia, M., Senne, F., & Barbosa, A. (2019). Public policies for digital transformation in Brazil: Challenges and achievements [Conference paper]. Congress of the Society for Advancement of Socio-Economics, New York, June 27-29.

BOOK CHAPTERS

Portilho, L., & Senne, F. (2019). Evidence for supporting the development of health policies: Brazil's experience. In A. L. Martínez, D. N. Ortiz, & F. Senne (Eds.). *Measurement of digital health: Methodological recommendations and case studies*. Pan American Health Organization (PAHO) and Brazilian Network Information Center (NIC.br). São Paulo: Brazilian Internet Steering Committee (CGI.br).

Martínez, A.L., Pitta, M., Bertón, J., Muxi, C., & Portilla, F. *Design and Implementation of ICT in Health Surveys: Methodology and Regional Experiences*. Pan American Health Organization (PAHO) and Brazilian Network Information Center (NIC.br). São Paulo: Brazilian Internet Steering Committee (CGI.br).

Senne, F. (2019). Mapeando a origem das desigualdades digitais: um estudo empírico sobre a cidade de São Paulo. *Revista de Direito, Estado e Telecomunicações*, 11(1), 303-330.

Senne, F. (2019). Inclusão segregada: novas configurações das desigualdades digitais e panorama da literatura. *Proceedings of 43o Encontro Anual da ANPOCS*.

Senne, F., Portilho, L., & Barbosa, A. F. (2019). Inclusão desigual: uma análise da trajetória das desigualdades de acesso, uso e apropriação da Internet no Brasil. In H. Galperin (Ed.), *Communication Policy Research Latin America*, Vol. 13, pp. 247-260. Cordoba, Argentina.

Ribeiro, M. M. (2019). Medição, Internet e participação: Desafios para o contexto Brasileiro [Conference paper]. 2o Congresso do INCTDD, Universidade Federal da Bahia (UFBA), Salvador, Bahia, October.

Adib, L., & Senne, F. (2019). Plataformas digitais y aprendizaje: indicadores sobre el acceso, actividades y habilidades digitales de niños y adolescentes en Brasil. In L. Brossi, T. Dodds & E. Passeron (Eds.). *Inteligencia Artificial y Bienestar de las Juventudes en América Latina*. Santiago: LOM Ediciones.

Jereissati, T., Barbovski, M., Macaya, J., & Cantoni, S. L. (2019). Technologies and youth: Key dimensions for investigating gender differences in internet access and use. In Taking stock: Data and evidence on gender equality in digital access, skills and leadership. A report by the EQUALS Research Coalition.

▶ Other Publications

Barbosa, A. F., Rovai, A. A., & Gonçalves, G. K. (2019). *Empowering students to become agents of social transformation through mobile learning in Brazil: Case study by the UNESCO-Fazheng project on best practices in mobile learning*. New York: UNESCO.



**F. Almeida, G. Torrezan, L. Lima,
& R. E. Catelli (Organizers)**
(2019). *Culture, Education and
Technologies in Debate (Vol. I)*. São
Paulo: CPF-Sesc.



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