# 2018

Annual Report Cetic.br

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.
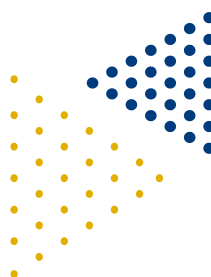
About Cetic.br

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 Category II UNESCO Center with the mission of monitoring the development of knowledge and information societies in Latin America and the Portuguese-speaking countries of Africa.
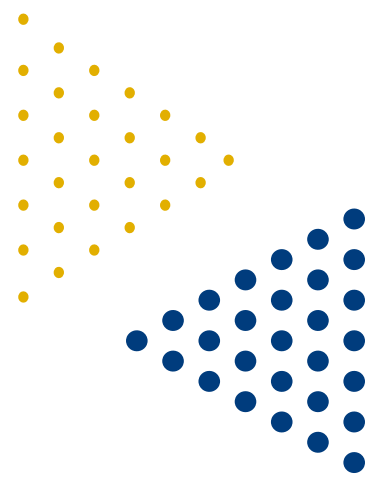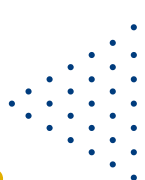
Presentation

In 2005, the Brazilian Network Information Center (NIC.br) created the Center for Studies on Information and Communication Technologies (Cetic.br) to provide policy-relevant data on access to – and use of – information and communication technologies (ICT) for governments, academics, and other Brazilian stakeholders.

In 2012, Cetic.br expanded its objectives and scope of action, becoming the Regional Center for Studies on the Development of the Information Society. Based in São Paulo, Brazil, this Category 2 UNESCO center, makes an effective strategic contribution to several objectives set forth by UNESCO for the Communication and Information (CI) sector, including those related to broader United Nations (UN) initiatives such as the Sustainable Development Goals (SDGs) or theme-specific agendas such as the World Summit on the Information Society (WSIS).

Cetic.br consolidated a seven-year track record as a UNESCO Center in 2018, increasing cooperation with Latin American countries and Portuguese-speaking countries in Africa. It is hoped that efforts with numerous stakeholders, both regionally and globally, will lead to enhanced engagement, fostering the development of information and knowledge societies. Such cooperation encompasses capacity-building programs on survey methodologies aimed at promoting the production of internationally comparable ICT data and activities related to the development of information and knowledge societies through quantitative and qualitative indicators for policy design and monitoring. Regular production and analysis of ICT data, promotion of South-South cooperation, and dissemination of best practices in data production are thus the pillars of Cetic.br.

NIC.br fully funds all of Cetic.br's projects and activities thanks to resources derived from Brazil's Internet domain name registry, i.e., the country code top-level domain (ccTLD) ".br" operated by Registro.br, a department of NIC.br. Registro.br is responsible for the registration and maintenance of domain names under ccTLD ".br", for the distribution of IPv4 and IPv6 addresses, and for assigning Autonomous Systems Numbers (ASN) in the country.

Thanks to the success of the Brazilian Internet governance multistakeholder model, which has been gaining international recognition since its inception in 1995, and to revenue from domain name registration, NIC.br produces value for society – it fosters Internet development through numerous activities such as those carried out by Cetic.br. This model not only
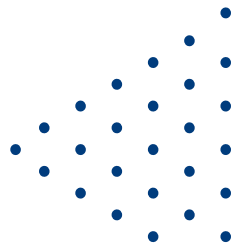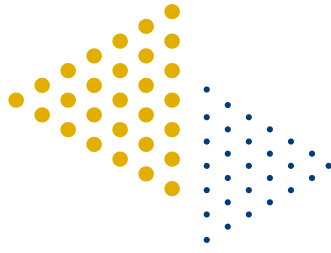
brings innovation to Brazil's Internet ecosystem, but also funds technological developments and enables actions, including Internet traffic exchange points, incentives and support for IPv6 adoption, the measurement of broadband quality, online security incident management and analysis, the establishment of web app standards, open data, and statistical data production.

In this annual report, we present a summary of Cetic.br's activities in 2018. A notable achievement this year was the development and launch of a global 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. This high-quality e-course is free and open to everyone. It looks at the role of ICT for achieving the UN's SDGs and addresses the following topics: the rapid and dynamic growth of the Internet, mobile phone usage, Big Data, Artificial Intelligence, and other trends in the implementation and measurement of sustainable development around the world.

Another relevant activity toward the development of information and knowledge societies in 2018 is the Center's contribution to UNESCO's "Internet Universality Indicators" project. Cetic.br 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 of 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 pre-test and pilot for Internet Universality Indicators in Brazil.

Finally, over the last year, together with the Brazilian National Computer Emergency Response Team (Cert.br), Cetic.br participated in the design of a data collection instrument for the Organisation for Economic Co-operation and Development (OECD) to be used in a survey model to measure digital security risks in businesses of all sizes. The Center also worked with the UNESCO Institute for Statistics (UIS) in the field of education to produce a practical guide for measuring ICT adoption in schools with the goal of developing regionally and globally comparable data.

These are but a few examples that confirm Cetic.br's position as a reference center for the production of ICT indicators, which are essential to NIC.br's efforts to develop strategies that promote Internet access for all.

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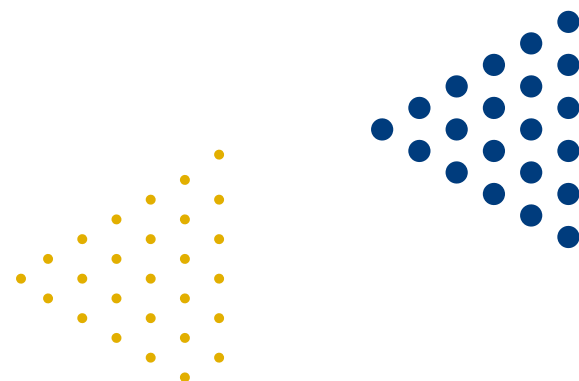
Introduction

We are in the midst of a data revolution. Digital-technology adoption has increased extensively in all sectors of society, triggering the production of massive amounts of data (Big Data). Consequently, new sources for the production of statistics that support policymaking and decision-making, while fostering sustainable development and economic growth, have emerged.

These sources include, among others, telecom and Internet providers, social media companies, mobile and tracking devices, private-sector transaction data such as that from credit cards and banking. Data, however, is being produced faster than it can be transformed into useful information for policymaking. As demand increases and resources decrease, stakeholders from various walks of life will be needed to develop and disseminate information and knowledge for social good. And many technologies such as cloud computing, Artificial Intelligence, machine learning, Big Data, trusted data platforms, and open data will play a pivotal role in processing large pools of data which are often widely distributed.

To bring about change in the domain of sustainable development, we will have to measure and monitor the actions of a myriad of public policies. Data and statistics production will be crucial for tracking progress towards the objectives set out in the United Nation's Sustainable Development Goals (SDGs) – an agenda for sustainable development or plan of action for people, planet, and prosperity.

In such a context of rapid change, the Regional Center for Studies on the Development of the Information Society (Cetic.br) thus plays an even greater role. Created to produce national and policy-relevant data, upon approval by the United Nations Educational, Scientific and Cultural Organization (UNESCO) General Conference, Cetic.br became a UNESCO Category II Center in 2012. It is at that time that its mission grew to: "contribute to building inclusive knowledge societies through information and communication technologies" in Latin America and Portuguese-speaking countries in Africa. Cetic.br has been active in both regions ever since, pursuing measurement, capacity building, and knowledge production projects.

This report gives a general overview of Cetic.br's major accomplishments in 2018. The actions described reflect NIC.br and Cetic.br's commitment to building inclusive information and knowledge societies in Latin America and Portuguese-speaking Africa.

Throughout the year, Cetic.br carried out a series of projects to enhance reliable data production on Internet use and promote related capacity-building activities with a goal towards meeting data needs for the SDGs. Thanks to its experience over recent years, Cetic.br has positioned itself as a reference, on both national and international fronts, in the standardization of indicators and methodological definitions for the production of data related to information and communication technologies (ICT).
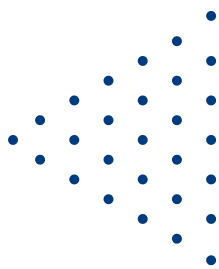
Building on its long history of multi-sectorial ICT measurement, in 2018 Cetic.br continued to carry out nationwide surveys and studies, and produce reliable data and ICT statistics through qualitative and quantitative research. The Center's national ICT surveys are a source of reliable and relevant data for the design, implementation, and monitoring of ICT public policies in various segments of Brazilian society.

Cetic.br also continued to seek innovative solutions for data production – exploring new methodological tools for data collection and sharing and using new sources such as Big Data to complement traditional data sources in the production of public statistics.

To leverage new data sources such as Big Data, one must first build internal capacity for the corresponding technologies, including data storage, data integration, machine learning, and Artificial Intelligence. New functions were thus created within Cetic.br's organizational structure to better accommodate end-to-end innovation. Great emphasis was put into revising existing processes and on the need to embrace open data initiatives and remove barriers to new data source use. Cetic.br intensified its actions to promote online access to microdata on the ICT Households and Kids Online surveys, providing access to the data based on specific interests, and thus reinforcing the Center's commitment to disseminating information and knowledge and expanding the reach of its survey methodologies and results.

Cetic.br's solid partnerships with the Brazilian Institute of Geography and Statistics (IBGE), as well as with international organizations such as the International Telecommunications Union (ITU), UNESCO, and the United Nation's Economic Commission for Latin America and the Caribbean (ECLAC) have been central to the exchange of data and best practices for the production of internationally comparable data. The Center is currently working to build capacity in data science and analytics to innovate in the data production process.
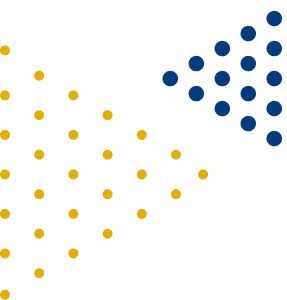
In 2018, Cetic.br published six books containing articles and data analyses for the following surveys: ICT Households, ICT in Education, ICT Kids Online Brazil, ICT in Health, ICT Enterprises, ICT Electronic Government and one publication from the NIC.br Sectoral Studies series related to the broadband in Brazil. Two editions of the Internet Sector Overview Report focusing on Big Data for Development and Artificial Intelligence and Ethics were also published. Furthermore, a policy brief on smart cities was co-authored with UNESCO. Cetic.br also translated UNESCO material that was only available in English into Portuguese and Spanish.
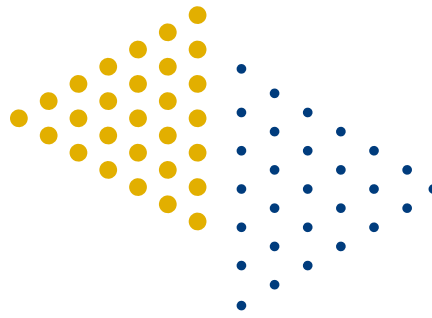
Ongoing synergies between Cetic.br and UNESCO´s Communication and Information (CI) Sector enabled the Center to effectively contribute to the development of a framework and a set of indicators to measure Internet development in countries: Internet Universality Indicators and the ROAM Framework. This framework and the proposed indicators – which use a broad approach that goes beyond infrastructure and access and addresses other important dimensions such as human rights, openness and multistakeholderism – are well suited for measuring Internet development. The co-operation included the engagement of experts who contributed in the validation

process for the ROAM Framework thanks to their input during the public consultations, the pre-test and the pilot of the Internet Universality Indicators conducted by Cetic.br in Brazil.

Cetic.br undertook actions to engage key Brazilian stakeholders from government, academia, and civil society organizations so that they could provide feedback for phases 1 and 2 of the consultation process. Along with the UNESCO Montevideo Office, Cetic.br coordinated regional and national public consultations on the ROAM framework. Later, Cetic.br also carried out the pre-test and the pilot of the Internet Universality Indicators. The pilot was important not only to understand the feasibility of data collection in all four of ROAM's dimensions but also to better understand different stakeholders' roles and capacity in providing access to reliable quantitative and qualitative data sources.

In 2018, Cetic.br continued its active participation in ICT indicator forums such as those hosted by the ITU, ECLAC, the Organisation for Economic Co-operation and Development (OECD), and UNESCO.

To build capacity, Cetic.br offers annual workshops in Brazil, Latin America and Portuguese-speaking Africa. The workshops cover theoretical and practical survey methodology concepts, including data collection and data analysis techniques. They also foster discussion, allowing ICT data users and producers to share their experiences. In 2018, Cetic.br organized a capacity-building workshop in São Paulo that explored 'Smart

The four principles of Internet Universality – known as the R-O-A-M principles – are seen as fundamental to the development of the Internet in ways that are conducive to achieving the Sustainable Development Goals. These principles are R – that the Internet be based on human Rights; O – that it is Open; A – that it should be Accessible to all, and M – that it is nurtured by Multistakeholder participation.

(Source: UNESCO, 2018) [1]

[1] UNESCO (2018) https://en.unesco.org/internetuniversality/indicators accessed in 28/01/2019

Cities and the Digital Economy' themes, and developed and promoted a massive open online course: "Tech for Good: The Role of ICT in Achieving the SDGs." These capacity-building initiatives are essential for the discussion of the challenges of measuring ICT. They also bring together different stakeholders – data producers and users, for instance.

Cetic.br held nine public debates in 2018 on the following themes: education, health, culture, Big Data, the digital economy, among others, thus fostering meaningful dialogue among key stakeholders. Cetic.br also organized another important event – an interministerial meeting in which Brazilian policymakers discussed the impacts and benefits of digitalization on social and economic development.

All ICT surveys carried out by Cetic.br rely on the technical and methodological support of renowned experts who validate indicators, methodology, and the definition of guidelines for data analysis. These experts play a crucial role in identifying new areas of investigation, improving methodological procedures, and obtaining reliable data. Throughout the year, Cetic.br held nine expert group meetings in which more than 240 experts from various sectors participated. Such activities serve to bridge the gap between policymakers and data producers.

Finally, in 2018, Cetic.br actively participated in several international conferences, symposiums, seminars, and technical forums, debating methodology and indicators for measuring information and knowledge societies and the digital economy. The Center attended national and international events, sharing the Center's work and contributing to the debate on the role of ICT measurement for development.

In 2018, UNESCO and Cetic.br/NIC.br worked in partnership with the SDG Academy to develop and launch a Massive Open Online Course (MOOC): "Tech for Good: The Role of ICT in Achieving the SDGs." This 10-week course discusses how ICT – and, notably, the Internet – are crucial to achieving the SDGs. The course highlights the rapid and dynamic growth of the Internet, data, mobile phone usage, Artificial Intelligence, and other recent trends and explores opportunities and challenges in the relationship between ICT and the SDGs [2]. Case studies are presented on the role of ICTs in achieving health, education, governance, infrastructure, and finance goals related to the SDGs.

[2] For more information: https://sdgacademy.org/course/tech-for-good/

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), linked to the Brazilian Internet Steering Committee (CGI.br), was created in 2005 with the mission of producing data on access to, use and appropriation of information and communication technologies (ICT) in Brazil in various segments of society. These data serve as input for formulating and monitoring public policies that contribute to the development of the Internet in the country.

In 2012, Cetic.br became a UNESCO Category 2 Center, the first center of this kind dedicated to the development of the information and knowledge societies. Among the five sectoral areas covered by UNESCO, the Center is linked to the Communication and Information (CI) sector and it contributes to the institution's strategic objectives by strengthening its efforts to monitor the building of information and knowledge societies. Its regional work covers Latin America and Portuguese-speaking countries in Africa.
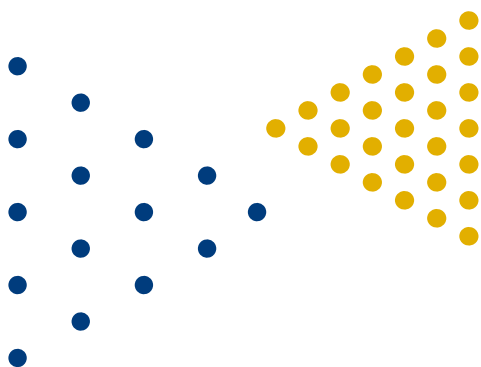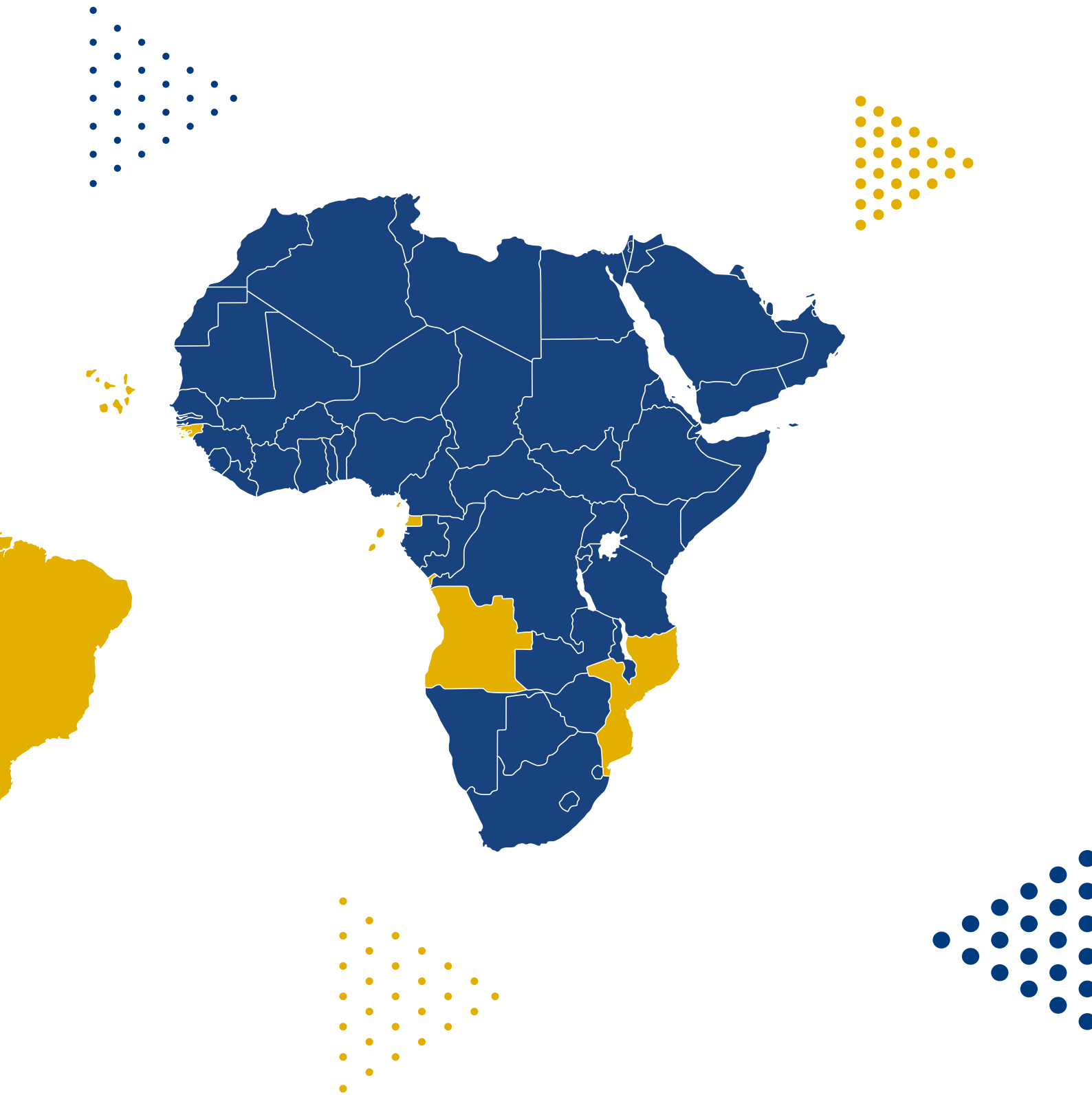
▷ ICT Data Production Ecosystem

Countries are currently under increasing pressure to produce high-quality data in a timely manner for the monitoring of national and international goals, such as the Sustainable Development Goals (SDGs). In a scenario in which massive amounts of data are made available at increasingly larger rates – under the so-called data revolution – new data sources and new institutional arrangements are reshaping the data and statistics production ecosystem. Along with traditional data sources such as administrative and survey data, Big Data emerges as an alternative data source, shedding light on private data sources and adding complexity to the ICT data production ecosystem. This diversity of stakeholders requires the development of technical, legal and institutional frameworks for data sharing in this new context.

This statistical data production and ecosystem can be represented by a layered model, as shown in Figure 1, and supported by the concept of "trusted data collaboratives," which are increasingly relevant for the interface between data producers and users. The upper layer represents data users and their data needs. The middle layer represent data sources in traditional national statistics systems and a wide range of possible new sources of data in the private sector. The bottom layer represents a new possibility for sharing data, via partnerships supported by platforms called "trusted data collaboratives". Data sharing will require appropriate technical, legal and institutional frameworks that should support data production and use in this new ecosystem. In this context, public and private data providers will have to successfully conduct technical and commercial negotiations to enable data sharing.

Cetic.br occupies an important position in this new ecosystem, because it interacts directly with data users – such as the government, international organizations, enterprises and academia – and is therefore capable of identifying new demands for ICT data. Furthermore, the Center has close ties with the other data producing institutions in this ecosystem – for example, national statistical agencies and research centers – operating as a reference center for the production of specialized data about ICT in Brazil.

FIGURE 1: ICT DATA AND STATISTICS ECOSYSTEM

DATA USERS

SUSTAINABLE DEVELOPMENT GOALS

Government	Private Sector	Media
International Organizations		
Civil Society/NGO	Academia/ Research	General Public

DATA SOURCES

PUBLIC DATA PROVIDERS

Administrative Data	Survey data & census
Official agencies & institutes	Official statistical institutes & research centers
Ministries	

PRIVATE DATA PROVIDERS

Organic Data (Big Data)

Mobile	Crowdsourcing
Online traces	Social media
Financial transactions	

PARTNERSHIPS & FRAMEWORKS FOR DATA SHARING

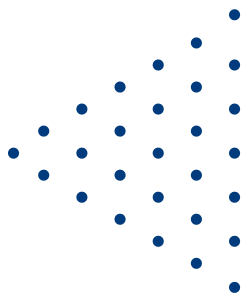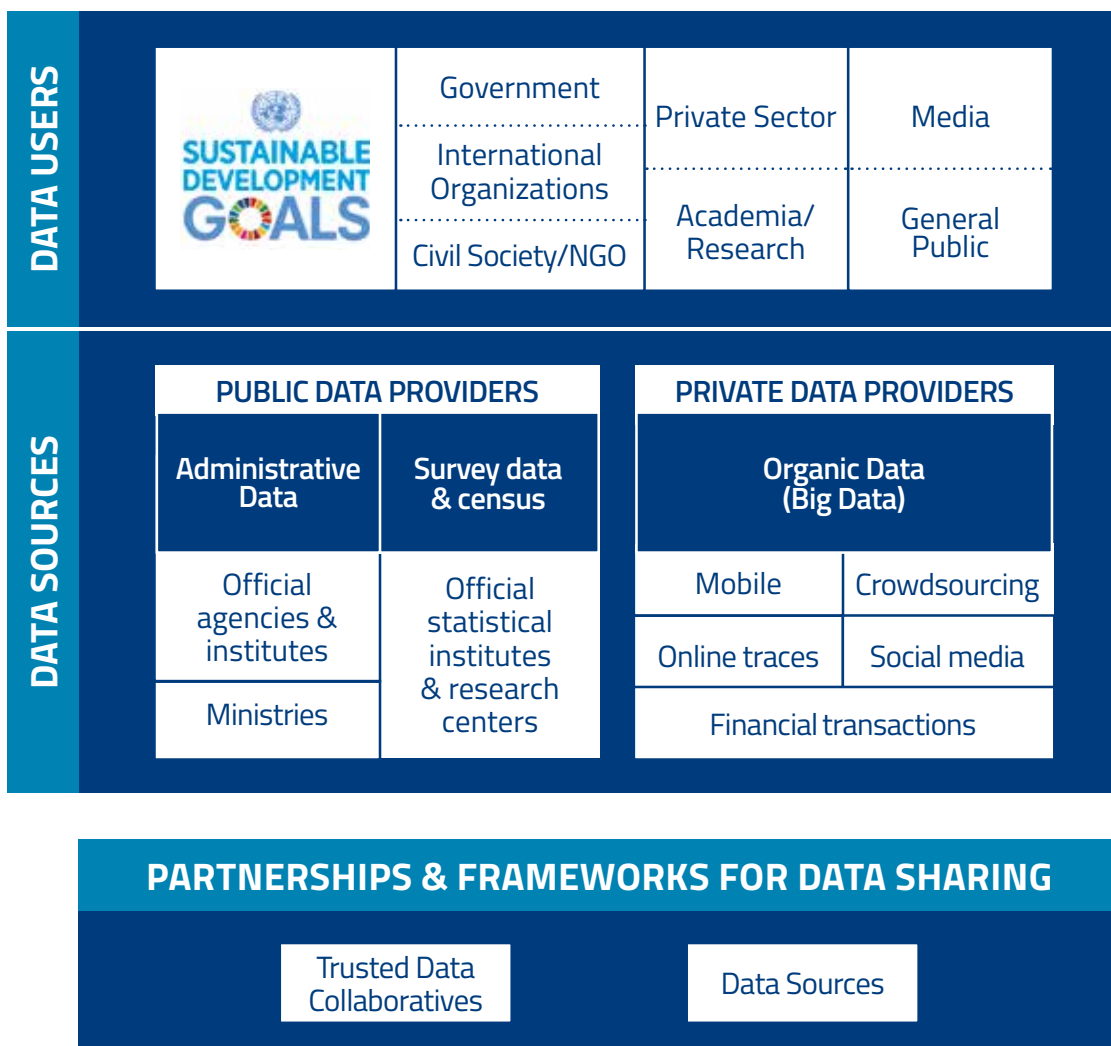Trusted Data Collaboratives   Data Sources

Source: Cetic.br

Main Lines of Action of Cetic.br

Cetic.br's lines of action encompass activities that contribute to discussions about the importance of ICT data for public policies and the sharing of experiences between key stakeholders who investigate the intersection between society and digital technologies, in addition to their implications for the building of information and knowledge societies.

Knowledge Center

This line of action aims to produce data through quantitative and qualitative research on ICT, as well as to disseminate information and knowledge, including survey methodologies, indicators, data analyses and thematic ICT publications that contribute to the building of inclusive information and knowledge societies.

Capacity-Building Programmes on Survey Methodologies

This line of action focuses on capacity-building programs for survey methodologies on the production of ICT-related statistics and indicators. These programs are conducted with the goal of improving the availability and quality of ICT statistics and fostering the production of internationally comparable data on access to and use of the Internet. This line of action is also intended to raise awareness among stakeholders of the role of data in evidence-based policymaking in the context of the development of information and knowledge societies.
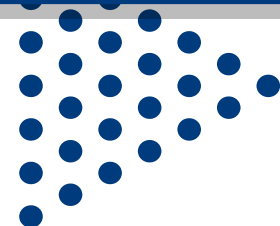
Laboratory of Ideas

Cetic.br also serves as a multistakeholder platform aimed at sharing experiences and encouraging debate among key stakeholders on the challenges of measuring ICT and on emerging issues related to the development of information and knowledge societies. Cetic.br promotes public debate, lectures and discussion panels with renowned experts from government, academia, international organizations and civil society organizations with a view to exploring the socioeconomic implications of ICT. Activities of the laboratory of ideas guarantee transparency and give legitimacy to all other lines of action conducted by the Center.

Culture and Ethics on the Internet

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

Methodological Approaches

I n its various phases, Cetic.br's data production process (Figure 3) follows international best practices aimed at ensuring the quality of the data produced through its different methodological approaches – quantitative and qualitative (Figure 2). Cetic.br's data production process embodies a multistakeholder approach that engages stakeholders from different sectors in different phases of the process. These stakeholders participate in the planning phase of the research project, definitions of the methodological approaches and in discussions on data analysis before data is released to the public.
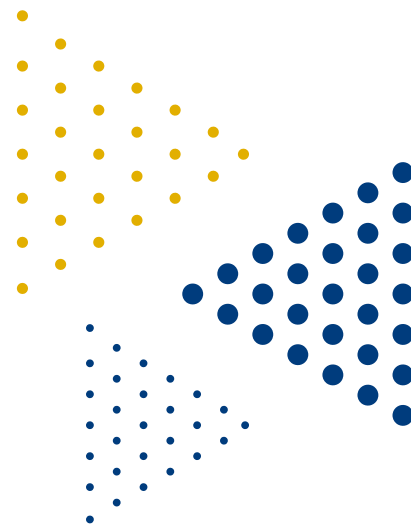
FIGURE 2: CETIC.BR'S METHODOLOGICAL APPROACHES

QUANTITATIVE		QUALITATIVE	
Structured (Designed Data)	Unstructured	Focus groups	In-depth interviews
Sample surveys/census	Organic Data (Big Data)		
Administrative registers	Web scraping		

FIGURE 3: CETIC.BR'S DATA PRODUCTION PROCESS

RESEARCH PLANNING	METHODOLOGICAL APPROACH		
Project Design	Data Collection	Data Processing & Management	Data Dissemination
Data Sources		Field Operations and Quality Management	Publications
Survey Data			Data Visualization
Administrative Data			Microdata Portal
Big Data New Data Sources			
Qualitative Data		DATA ANALYSIS	Data Users
	Framing & Registries	Microdata	Capacity Building
			Policymaking & Research

■ **Multistakeholder:** Government, International Organizations, Academia & Research Institutes, Civil Society Organizations
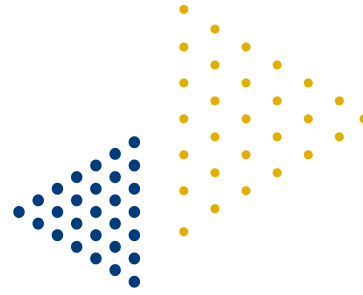
▷ The Center's Structure

In order to carry out its activities, Cetic.br is structured into four coordinations: ICT Survey Project Management; Quantitative Methods; Qualitative Methods and Sectoral Studies; and Process and Quality Management.

In recognition of the importance of studying phenomena involving the interface between digital technologies and society also through qualitative methods, as well as the relevance of quality and process management in its activities, Cetic.br was restructured in 2018 and now includes two new coordinations dedicated to these themes.
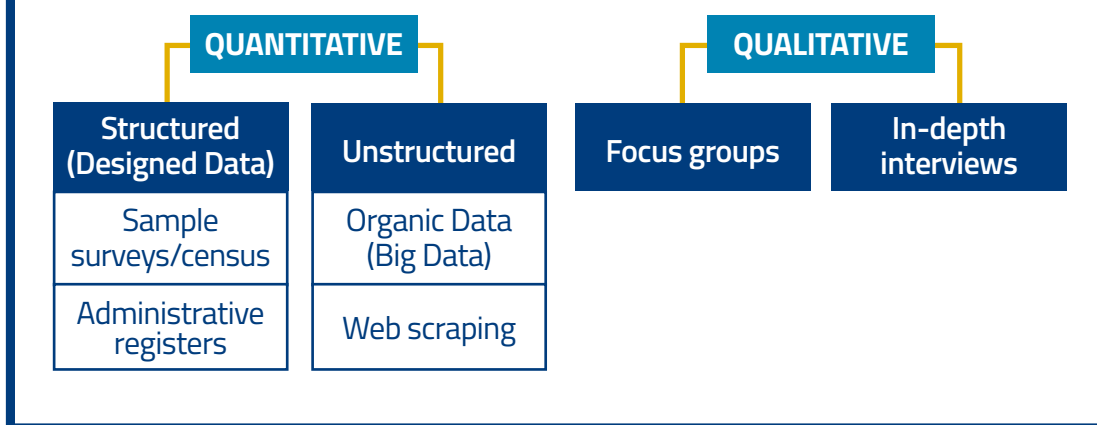
FIGURE 4 - CETIC.BR'S STRUCTURE

PROCESS AND QUALITY MANAGEMENT		
ICT Survey Project Management	Quantitative Methods	Qualitative Methods and Sectorial Studies
Laboratory of Methodological Innovation		
Publication & Dissemination Strategies		
International Cooperation Networks		
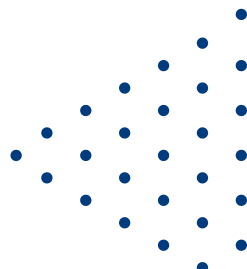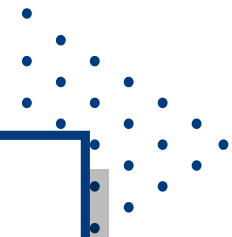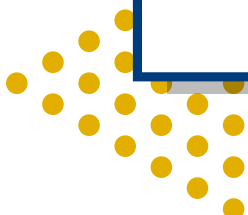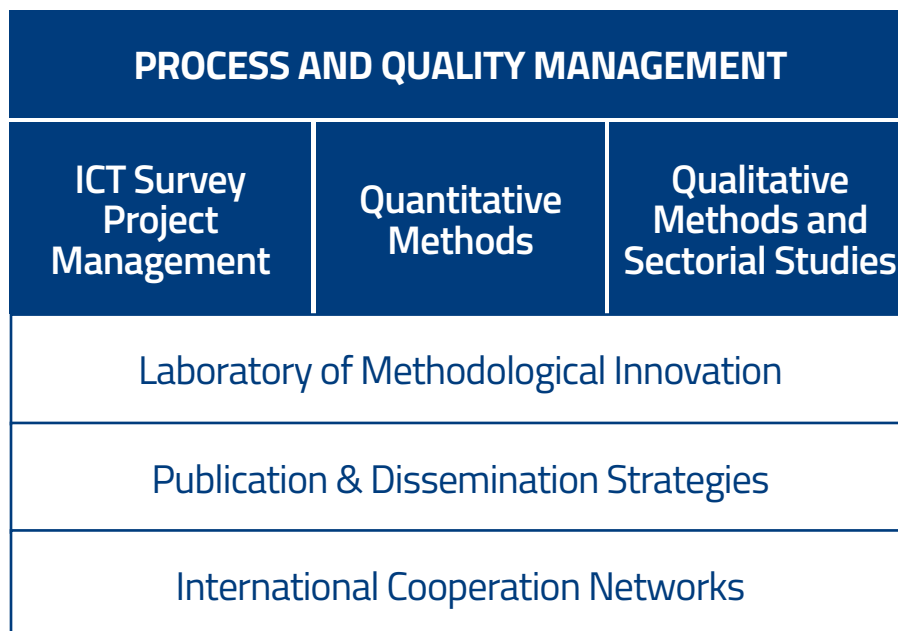
2018 Facts & Figures

1.138
Media appearances

+250
Field interviewers involved in data collection

21
Cooperation agreements in force

+550
Indicators published

240
External experts

+10
Publication of ICT surveys, NIC.br Sectoral Studies & a Sectoral Overview of the Internet

5
New cooperation agreements signed in 2018

+1.300
PARTICIPANTS
Massive Open Online Course

9
Expert meetings

+80
PARTICIPANTS
Capacity-building workshop on research methodologies

62.619
Interviews carried out in all of the Cetic.br surveys

Public Debates

Every year, Cetic.br/NIC.br conducts public debates with key stakeholders to discuss the building of information and knowledge societies. During 2018, the Center held public events that marked the launch of new publications and also served as a forum for discussing relevant themes, encouraging dialogue among civil society, government, academics and the private sector.

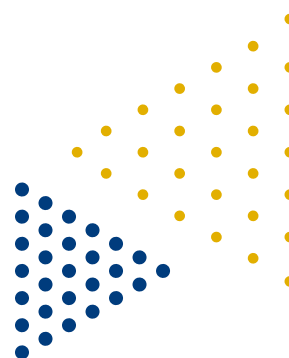Among the many public debates organized by the Center throughout the year, several addressed Cetic.br's ICT survey results, operating as transparency mechanisms that legitimize the work carried out by the Center. Below are some of the main events that took place during 2018.

▷ Seminar on Perspectives on Digital Government in Brazil || Launch of the ICT Electronic Government 2017 Survey

May 2018 – Brasília (Federal District)

The Ministry of Planning, Development and Management (MP), together with the National School of Public Administration (ENAP), promoted the seminar "Perspectives on Digital Government in Brazil," which presented the latest digital transformation actions taken by public administration at the federal level. The event marked the launch of the preliminary report "Review of Digital Government in Brazil" produced by OECD, addressing the main conclusions of the assessment of digital government in Brazil. At the same occasion,

Cetic.br/NIC.br released the data from the ICT Electronic Government 2017 survey; carried out every two years, this study investigates how the Brazilian government uses ICT with citizens.

Also at this event, the MP presented the final version of the Digital Governance Strategy (EGD), after it was reviewed and submitted to public consultation. Indicators from the ICT Electronic Government survey are used to monitor this strategy.

IX International Seminar on Cultural Policies || Launch of the ICT in Culture 2016 Survey

May 2018 – Rio de Janeiro (Rio de Janeiro)

The IX International Seminar on Cultural Policies, organized and carried out by the Casa de Rui Barbosa Foundation, the UNESCO Chair on Cultural Policies and Management, and the Itaú Cultural Observatory, dedicated its first day of activities to the launch of the ICT in Culture 2016 survey. The event included the participation of researchers, managers and other relevant stakeholders to discuss the survey's indicators and issues related to cultural policies and digital technologies.

During the opening ceremony, Marta de Senna, president of the Casa de Rui Barbosa Foundation, highlighted the crucial role of ICT for the development and dissemination of intellectual work. Adauto Soares, coordinator of Communication and Information Sector at the UNESCO Office in Brazil, emphasized the need for regular data production on the the use of ICT in the cultural sector.
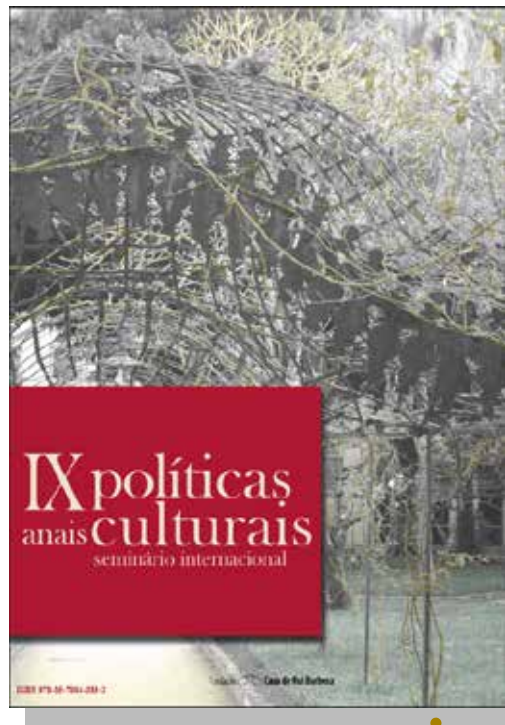
4th Interministerial Meeting: Dialogue on Public Policies and ICT Indicators in Brazil

June 2018 – Brasília (Federal District)

Hosted by the Brazilian Ministry of Science, Technology, Innovation and Communication (MCTIC), in partnership with Cetic.br/NIC.br, the goal of this meeting was to discuss how ICT can enhance public policies developed by the several ministries of the federal government. This fourth edition of the event discussed trends, future scenarios and the exchange of information about digital transformation for citizens, enterprises and governments. National and international experts participated in thematic roundtables that addressed topics such as smart cities, e-commerce and broadband.
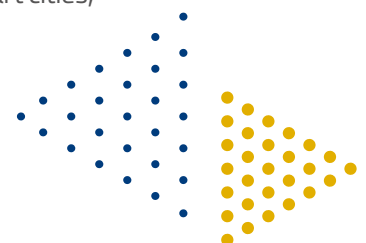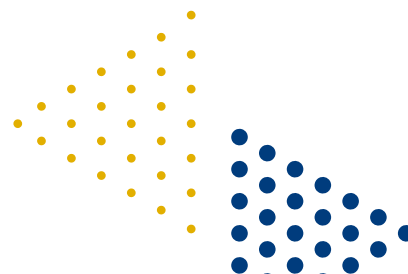
" *We are very pleased to provide information that underpins policymaking by public management and that provides policymakers with data that allow them to improve decision-making processes.* "
Demi Getschko.

The event featured an opening presentation by Anne Carblanc, head of the Committee on Digital Economy Policy (CDEP) of OECD on the topic "Key Issues for the Digital Transformation".

All of the thematic panels featured presentations of the ICT survey indicators by Cetic.br/NIC.br, followed by roundtables that included representatives of the government, the private sector and academia. In addition, three representatives of multilateral organizations made presentations: the panel "Smart Cities: challenges to the use of ICT in urban management", with a lecture by Delfina Soares, head of the United Nations University (UNU-EGOV); the panel "Digital Transformation and perspectives for e-commerce" with the remote participation of Teresa Moreira, head of competition and consumer policies of the United Nations Conference on Trade and Development (UNCTAD); and the final panel "Supply, demand and the quality of Broadband" in which Lorrayne Porciuncula, OECD economist and policy analyst, discussed the role of broadband policies as the foundation for digital transformation.

Also at this event, three new publications were launched and main findings were presented by Cetic.br/NIC.br at the start of each thematic panel: ICT Electronic Government 2017, ICT Enterprises 2017, and a new study that is part of the NIC.br Sectoral Studies series, "Broadband in Brazil: a study of the evolution of access and quality of Internet connections."

PHOTOGRAPH BY RICARDO FONSECA

" *The value of this event must be recognized by all of us at the Ministry and in civil society, because it means that we are spearheading the discussion in the country, with good and valid information, and seeking solutions for our problems.* "
Artur Coimbra, director of the MCTIC Broadband Department

▷ Workshop on Digital Economy
September 2018 – Rio de Janeiro (Rio de Janeiro)

To promote the sharing of experiences on the measurement of the digital economy and discussion of the current demand for statistical information, the Brazilian Institute of Geography and Statistics (IBGE) organized the Workshop on Digital Economy, which is part of the program that preceded the Centre for International Research on Economic Tendency Surveys Conference (CIRET Conference). The goal of the event was to

discuss challenges and opportunities for official statistics producers in the context of the digital economy.

The conference was carried out in partnership with Cetic.br/NIC.br, and the opening lecture was given by Wilson Peres Nuñes (United Nations Economic Commission for Latin America and the Caribbean - ECLAC) and addressed perspectives for Latin America regarding digital economy and innovation.

Other panels addressed the emergence of technologies and innovative experiences and the challenges of measurement in the context of the digital economy from the perspective of academics, the government and the private sector. The event was closed by Prof. Johannes Bauer (Michigan State University), who gave a presentation about digital transformation and the digital economy.

▷ XVI Brazilian Health Informatics Conference (CBIS): Digital Health for Citizenship || Launch of the ICT in Health 2017 Survey

October 2018 – Fortaleza (Ceará)

The 16th edition of the CBIS, held by the Brazilian Society of Health Informatics (SBIS) with the support of the University of Fortaleza (Unifor), included themes from different segments of the medical informatics area, such as electronic medical records, strategic management, digital solutions for the public and private healthcare establishments, professional training, interoperability standards, and mobile applications for the health sector.

The fifth edition of the ICT in Health survey was released at the event, followed by a presentation of its main results and a discussion of its key findings.

The release included the participation of Prof. Heimar de Fátima Marin, scientific coordinator of the ICT in Health survey (Federal University of Sao Paulo – UNIFESP – and Sírio-Libanês Hospital, São Paulo), Guilherme Ribeiro Telles (Informatics Department of the Brazilian Public Health System – DATASUS), Alexandre Barbosa, (Cetic.br/NIC.br), and Prof. Marcos Gutierrez (The Heart Institute, University of São Paulo – InCor/HC-FMUSP).

> *With this 5-year series of surveys, we verified the evolution and trends of the main aspects involving ICT in the health sector in Brazil, such as increased use of electronic medical records and online access to services. It is extremely important that these data be considered in policymaking for the sector.*
> **Heimar F. Marin**.

PERSONAL COLLECTION
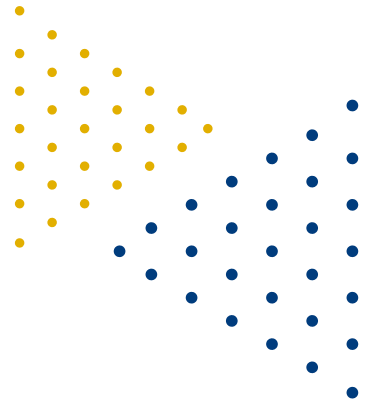
▷ Series of Debates: Culture, Education and Technology

September to November 2018 – São Paulo (São Paulo)

With the goal of discussing strategic aspects of the interface between culture, education and technologies, and in order to underpin the creation and dissemination of knowledge based on a perspective in tune with democracy, freedom and social equity, the Center for Research and Training of the Social Service of Commerce (CPF-SESC), Cetic.br/NIC.br and Pontifical Catholic University of São Paulo (PUC-SP) collaborated to release the Series of Debates: "Culture, Education and Technologies." Over a period of three months, the debates addressed the current Brazilian scenario regarding culture, education and ICT appropriation, based on the data produced by Cetic.br's ICT surveys. Throughout this cycle, discussions addressed the inequalities in ICT appropriation and the reasons and possible solutions for bridging existing gaps, in view of contributing toward the development of public policies on culture and education.

Session 1 – Digital culture: where are we and where are we headed?
Speakers: Lúcia Santaella (PUC-SP) and Sérgio Amadeu (Federal University of ABC – UFABC and CGI.br).

Digital culture establishes new worlds of communication, economic ways of life and sociocultural dynamics. Based on a selection of indicators that illustrate how Brazilians from different ages and socioeconomic segments use ICT, the event stimulated reflections about the opportunities and risks of a connected world.

Session 2 – Knowledge, skills and curriculums in information and knowledge societies
Speakers: Alípio Casali (PUC-SP) and Lucia Dellagnelo (Center for Innovation in Brazilian Education – CIEB).

The so-called 21st-century skills constitute new forms of humanity relating to knowledge. In this context, how can we consider the curriculums for school education, the roles of informal education, and cultural practices? Using data on Internet activities and digital skills, this roundtable discussed which skills are critical for information and knowledge societies.

Session 3 – Educational and cultural policies: paths and perspectives
Speakers: Haroldo Torres (Din4mo) and Vicente Trevas (South American Agency for Cooperation and Strategic Management of Public Policy).

Culture and education are two sides of the same coin; however, these two areas are seldom coordinated altogether for the formulation of public policies for the provision of fundamental human rights. Based on data about ICT adoption in schools and cultural facilities, perspectives were discussed for strategic interventions in the educational and cultural fields.

VIII Internet Forum in Brazil || Launch of the ICT Households 2017 Survey

November 2018 – Goiânia (Goiás)

Based on the Internet Governance Forum (IGF) and promoted annually by CGI.br, the Brazilian Internet Forum is the main event for the discussion of themes related to Internet governance in the country. The 2018 edition was the stage for the launch of the ICT Households 2017 survey.

Carried out since 2005 and in its thirteenth edition, the survey presents indicators regarding access to ICT in Brazilian households and their use by the population aged 10 or older.

The release occurred in the opening ceremony of the Forum and featured a presentation with new survey data about cultural activities carried out online regarding audiovisual practices (such as watching videos, programs and films or listening to music online), and the dissemination of content created by Internet users, as well as the impacts of different devices and Internet connections for carrying out cultural activities. The data release was followed by a debate with Sérgio Amadeu (UFABC and CGI.br), Flávia Lefévre (CGI.br), Marcos Dantas (CGI.br and Federal University of Rio de Janeiro –UFRJ), Luiz Fernando Martins Castro (CGI.br) and Alexandre Barbosa (Cetic.br/NIC.br).

> " With this new phase of the survey, we observed the ways in which different types of Internet access influence the consumption of cultural goods and services and reinforce discrimination, inequalities and lack of democratization of public policies across our country. Infrastructure needs to be better distributed
>
> **Flávia Lefévre**.
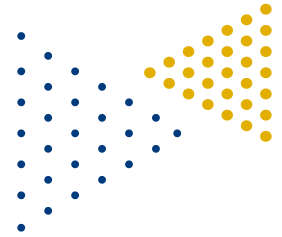
▷ **Internet Use by Children and Adolescents: Education for Digital Citizenship || Launch of ICT in Education 2017 and ICT Kids Online Brazil 2017 Surveys**

November 2018 – São Paulo (São Paulo)

The launch of the ICT in Education 2017 and ICT Kids Online Brazil 2017 surveys served as a backdrop for a discussion of education and digital media policies, the protection of children's rights, and the critical, safe and responsible use of technologies by the young.

Two Latin American researchers participated in the event as guest speakers: Roxana Morduchowicz (a specialized media consultant from Argentina) and Julio Gaitán (University of Rosário, Colombia). Other invited speakers included philosopher Mario Sérgio Cortella and Alexandre Schneider, the Municipal Secretary of Education of the City of São Paulo, who contributed with broader reflections about the benefits and risks linked to Internet use and also shared practical experiences on the adoption of ICT as a pedagogical tool in public schools in the city of São Paulo. Regina Alcântara de Assis (Education, Communication and Culture Department of the Roquette Pinto Foundation of the Ministry of Education) moderated the debate.

"
At a time when access to the Internet is more widespread, we must think about how children are using the Internet, how we can strengthen safe, reflective, critical and creative use of technologies and the Internet.
Roxana Morduchowicz.

Algorithms determine our beliefs, they profile us. This is something we do not control politically and that is expressed in a language we do not understand. Technical discussions define our lives and therefore it is essential to have public debates on these topics
Julio Gaitán.
"
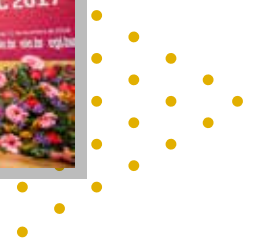
▷ VIII Internet Infrastructure Week in Brazil || Release of the ICT Providers 2017 Survey

December 2018 – São Paulo (São Paulo)

The results of the third edition of the survey on the Internet service provider sector in Brazil – ICT Providers 2017 – were launched during the 12th Internet eXchange (IX) Forum, an event that was part of the VIII Internet Infrastructure Week Brazil. This event promotes discussions about good practices for network security and Internet traffic exchange.

Discussions were held about issues related to network management, especially in terms of the actions for Internet traffic optimization. With the presence of national and international representatives from the most diverse organizations involved in the provision of access to the Internet and content provider organizations, the event focused on presenting best practices in network architecture, technological innovations and security. The activities of IX.br were also mentioned,

highlighting the importance of access providers, considering that efficient traffic management is essential for improving the Internet in Brazil. In this regard, it should be noted that the ICT Providers 2017 survey addressed the presence of providers at traffic exchange points or IX.br, as well as the barriers faced by the enterprises that do not participate in these initiatives, which are crucial for improving the provisioning of Internet access services.

> *Micro and small enterprises play an extremely important role in digital inclusion in Brazil, especially when providing services to the population living in the regions farthest from large urban centers with low market attractiveness for large providers.*
> **Alexandre Barbosa**.

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 for their use in public policies, academia and sectoral market analysis. These activities are directed at data producers and users, such as national statistics institutes, ministries, regulatory agencies and international organizations, and academic institutions. In addition to disseminating technical knowledge about survey methodology, these meetings 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 2018, the Center also developed its first massive open online course about ICT and sustainable development. This pioneer 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.

NIC.br Annual Workshop on Survey Methodology ‖ Smart Cities & the Digital Economy

April 2018 – São Paulo (São Paulo)

The central theme of the 8th edition of the NIC.br Annual Workshop on Survey Methodology was "Smart Cities & the Digital Economy". It promoted the sharing of experiences among researchers, policymakers, representatives of civil society and international organizations from 10 countries in Latin America, Africa and Europe.

The goal of the Workshop went beyond covering theoretical and practical concepts about survey methodology, also stimulating debate among data producers and users about emerging themes associated with new digital technologies. In addition to discussing underlying concepts behind these themes, the participants debated challenges related to their measurement.

The program focused on smart cities and the digital economy, and also on their socioeconomic implications, such as e-waste, privacy and cybersecurity.

This edition featured interventions and short courses delivered by the following guest speakers: Karin Breitman (Rio Tinto), Johannes Bauer (Michigan State University), Maria Alexandra Cunha (Getulio Vargas Foundation), Maurício Bouskela (Inter-American Development Bank), Vanessa Forti (United Nations University),

Carlos Affonso Souza (ITS Rio), Cristine Hoepers (Brazilian National Computer Emergency Response Team – CERT.br), Benjamin Dean (Consultant for the OECD), and Pamela Campanelli (The Survey Coach). The program also featured a panel with representatives from three UN organizations: the UNESCO Regional Scientific Office for Latin America and the Caribbean, the National Offices of the United Nations International Children's Emergency Fund (UNICEF), and the United Nations Human Settlements Programme (UN-Habitat), which shared their perspectives and initiatives relative to cities, based on the UN's Sustainable Development Goals.

Summer School on Digital Transformation in Latin America
July 2018 – Barcelona (Spain)

In its fifth edition, the IBEI-CEPAL-CAF Summer School, supported by Cetic.br/NIC.br, addressed themes relative to digital integration at the regional level of Latin America and Europe, investigating, among other topics, the configuration of a digital regional market.

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 innovation in development among representatives of different sectors, such as government, multilateral organizations, research centers, NGOs, the private sector and universities.

The program was divided into four blocks: challenges to the digital economy; exploring data and digital services; digital transformation and productive activity; and regulation, innovation and sustainability.

At the round table "Work 4.0: Artificial Intelligence and Robotics" Cetic.br/NIC.br addressed the challenges of measuring the digital transformation, sharing the Center's project for producing e-commerce indicators via Web Scraping tools and the results of a quality analysis of broadband connections in Brazil, measured based on data collected by the Internet Traffic Measurement System (SIMET). Moreover, NIC.br supported the participation of representatives from IBGE, UNU-EGOV, along with speakers from Michigan State University and Hekima, who contributed to the event.
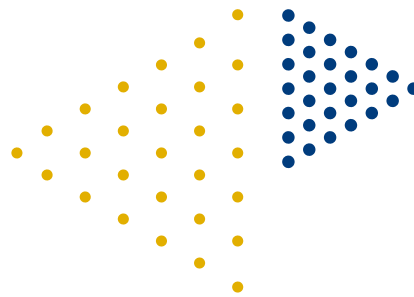
▷ ## Massive Open Online Course || Tech for Good: The Role of ICT in Achieving the SDGs

During 2018, Cetic.br/NIC.br, in partnership with UNESCO and the SDG Academy, developed the "Tech for Good" online course. Gathering leaders and agents of change from all regions of the world in fields related to ICT and sustainable development, the course covered the role of ICT in achieving the SDGs. The course addresses how digital technologies are empowering billions of people around the world by providing access to education, health care, banking, and government services; how ICT is being used to inform smarter, evidence-based policies to improve people's lives in fundamental ways; and how these technologies can be used for measuring and monitoring the achievement of the SDGs. The course also addresses the new challenges that technology can introduce, such as privacy, data management, risks to cybersecurity, e-waste, and the widening of social divides.

Available free of charge and in open format on the edX online course platform (https://www.edx.org/), the course was launched in October and lasted 10 weeks, during which 10 thematic modules were developed. In addition to the participation of Dorothy Gordon (UNESCO Information For All Programme – IFAP) as the course's faculty leader, the other modules were headed by José Clastornik, from the Agency for Development of Electronic Government and Information Society and Knowledge (AGESIC/Uruguay) (Module on Technology for Governments and Citizens);

Doreen Bogdan-Martin, from the International Telecommunication Union(ITU) (Module on ICT Infrastructure); Chief Nathaniel Ebo Nsarko, from the Millennium Promise Alliance & the One Million Community Health Workers Campaign (1mCHW) (Module on ICT Innovations in Health); Guilherme Canela Godoi, from the UNESCO Montevideo Office (Module on Learning in Knowledge Societies); Eduardo Diniz, from the Getulio Vargas Foundation (Module on Promoting Financial Inclusion); Luis Gonzalez Morales, from the UN Statistics Division, and Jessica Espey, from the UN Sustainable Development Solutions Network (Module on Measurement and Metrics); Sara Rendtorff-Smith, from the Data-Driven Governance and AI Policy (Module on Artificial Intelligence); Katina Michael, from the University of Wollongong, and Jeffrey D. Sachs, from Columbia University (Module on Concerns for our Digital Future).

In addition to lectures, students participated through readings, interactive discussions, live sessions and short videos with voices from the field. In its first edition, 1,323 participants enrolled from 130 countries, the top countries being the United States, Brazil, India, the United Kingdom, Germany, Canada, Kenya and Nigeria. Originally in English, in 2019 the course will be relaunched in the six official languages of the UN (English, French, Chinese/Mandarin, Spanish, Arabic and Russian).

Tech for Good
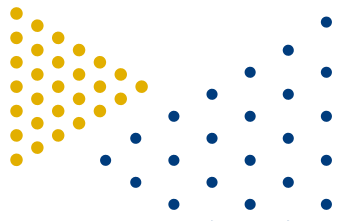
The Role of ICT in Achieving the SDGs

SUSTAINABLE DEVELOPMENT GOALS

COURSE MODULES	
Welcome to the Digital Age (Digital Divide-Approaches to ICT4SDGs)	Measurement and Metrics for ICT and the SDGs
Learning in Knowledge Societies	ICT Infrastructure
Artificial Intelligence for Development	Technology for Governments and Citizens
ICT Innovations in Health	Promoting Financial Inclusion
Concerns for Our Digital Future	The Way Forward (Future of Work - Open Movement)

PILLARS OF SUSTAINABLE DEVELOPMENT

ECONOMIC	SOCIAL	ENVIRONMENTAL

Technical Support for Strategic Partners

With 13 years of experience producing ICT statistics and promoting capacity-building and awareness-raising activities, Cetic.br/NIC.br has consolidated its position as a relevant stakeholder in the multisectoral ICT ecosystem. In this context, in 2018, the Center continued to work alongside important partners, such as the Latin America and Caribbean Network Information Centre (LACNIC), IBGE, ECLAC and UNESCO, while also initiating projects with new strategic partners, such as the OECD. The Center collaborated actively with these partners, providing technical and methodological support for processes that resulted in tangible outcomes, while also initiating joint processes that will extend into the coming years.

▷ UNESCO Internet Universality Indicators

In 2011, NIC.br and LACNIC, in alignment with CGI.br's 10 Principles for the Governance and Use of the Internet, discussed with the UNESCO Montevideo Office the importance of developing a framework and a set of indicators to measure Internet development in countries. As a result, NIC.br and LACNIC decided to fund the UNESCO's first concept note on this topic.

In 2014, during the NET Mundial Conference on the Future of Internet Governance held in São Paulo, Cetic.br/NIC.br hosted the first open public multistakeholder forum on the concept note that proposed the "**ROAM principles**", which advocate for a human-**R**ights-based, **O**pen, **A**ccessible Internet governed by **M**ulti-stakeholder participation. This discussion included more than 30 participants from Argentina, Brazil, Chile, Colombia, Ecuador, Guatemala, the United States, the United Kingdom and Uruguay.

In 2015, the multi-stakeholder conference "CONNECTing the Dots: Options for Future Action" addressed UNESCO's study on Internet access, free expression, privacy and ethics.

The concept of "Internet universality" was then consolidated. In the same year, during the 38th General Conference of UNESCO, the Internet Universality project was endorsed by the Conference.

In the following years, Cetic.br/NIC.br translated into Portuguese and Spanish UNESCO's final study on this theme, "Keystones to Foster Inclusive Knowledge Societies". This study was very important to dissemination and promotion of debate around this concept in the Latin American region. Both documents were published in December 2017. Also in 2017, Cetic.br/NIC.br undertook actions to engage key stakeholders from government, academia and civil society organizations in Brazil so that they could provide feedback on phases 1 and 2 of the consultation process. Written feedback was given by Cetic.br/NIC.br in both phases.

In 2018, Cetic.br/NIC.br, along with the UNESCO Montevideo Office, coordinated regional and national public consultation on the ROAM framework. Representatives from 11 Latin American and Caribbean
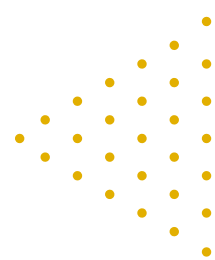
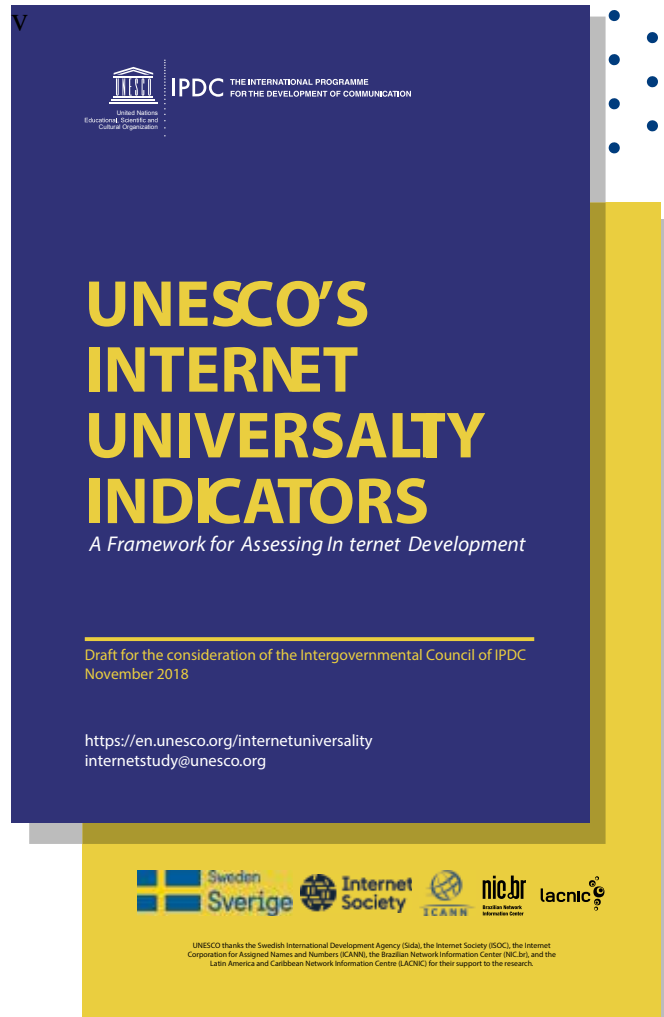*Since 2005, NIC.br has successfully produced indicators on Internet access and use in Brazil through Cetic.br. It is a pleasure to share knowledge and experience and to contribute with indicators that will be used by other countries, aimed at expanding the Internet's potential contribution toward sustainable development.*

Demi Getschko.

countries, from different sectors such as government, academia, and civil society met at NIC.br headquarters to discuss and produce a document with contributions to the measurement of Internet Universality Indicators. The meeting featured a presentation about the Internet Universality Indicators process and the document that resulted from the first phase of the consultations, followed by group discussions dedicated to each of the four principles.

Also in 2018, Cetic.br/NIC.br conducted the pre-test and pilot of the Internet Universality Indicators in Brazil. The pilot was evaluated in terms of general assessment of indicators; specific considerations on indicators; general assessment of sources and availability of data; level of application and data availability; proposals of indicators to be rewritten; proposals of indicators to be excluded; suggestions to public bodies about overcoming lack of data. The Internet Universality Indicators were approved in November of the same year, during the 31st council session of the International Programme for the Development of Communication (IPDC). At that event, Alexandre Barbosa presented the results of the pilot run of the methodology in Brazil, which, together with Senegal and Thailand, provided input for the validation of UNESCO's Indicators.

V

UNESCO IPDC THE INTERNATIONAL PROGRAMME FOR THE DEVELOPMENT OF COMMUNICATION
United Nations Educational, Scientific and Cultural Organization

UNESCO'S INTERNET UNIVERSALTY INDICATORS
A Framework for Assessing Internet Development

Draft for the consideration of the Intergovernmental Council of IPDC
November 2018

https://en.unesco.org/internetuniversality
internetstudy@unesco.org

Sweden Sverige | Internet Society | ICANN | nic.br Brazilian Network Information Center | lacnic

UNESCO thanks the Swedish International Development Agency (Sida), the Internet Society (ISOC), the Internet Corporation for Assigned Names and Numbers (ICANN), the Brazilian Network Information Center (NIC.br), and the Latin America and Caribbean Network Information Centre (LACNIC) for their support to the research.

▷ NIC.br & OCDE: Joint Task Force on Digital Security Risk Management Practices in Businesses

The OECD Secretariat set up a task force aimed at establishing a measurement framework and improving the evaluation of policies for digital security risk management practices in business. As part of the challenge to establish an instrument to collect data on this topic, the OECD worked with NIC.br through Cetic.br and Cert.br to develop a model questionnaire to be adopted in the Risk Management Practices in Businesses survey.

In order to take advantage of previous international efforts to define a commonly agreed methodological framework for measuring ICT-related issues in businesses, the proposed questionnaire took into consideration the frameworks presented by the Partnership on Measuring ICT for Development and recommendations of the OECD, UNCTAD and Eurostat, as well as standalone initiative from Canada that was already measuring cyber security risks.

Cetic.br/NIC.br developed a draft of the questionnaire, and after discussions and contributions by all the members of the task force, the first instrument was developed. The questionnaire was tested by the Center through cognitive interviewing, in order to assess the respondents' understanding of the subject and research questions. Following this phase, questions wording was adjusted a final version of the instrument was completed for the task force, to be piloted by the OECD.

▷ Monitoring the Digital Agenda in Latin America & the Caribbean

In collaboration with ECLAC, Cetic.br co-authored the report "Monitoreo de la Agenda Digital para América Latina y el Caribe, eLAC2018", a review of the fulfillment of the objectives of the Digital Agenda for Latin America and the Caribbean (eLAC2018), a regional digital policy strategy approved in 2015 with a vision for 2018.

The document analyzes the adoption of digital technologies in the region based on the five areas and 23 objectives of the eLAC digital agenda: I) access and infrastructure; II) digital economy; innovation and competitiveness; III) electronic government and citizenship; IV) sustainable development and inclusion; and V) Internet governance. The 2018 report was presented at the Sixth Ministerial Conference on the Information Society in Latin America and the Caribbean, held in Cartagena (Colombia) in April 2018, where the digital agenda was reviewed with a vision for 2020.

Monitoreo de la Agenda Digital para América Latina y el Caribe eLAC2018
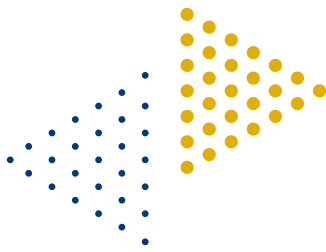
▷ NIC.br and LACNIC: Service Satisfaction Survey

As a member of LACNIC, NIC.br carried out a service satisfaction survey with registered autonomous systems. Its main goal was to improve relations with customers and users, to establish more efficient communication channels, through joint action by Registro.br and Cetic.br.

Cetic.br/NIC.br was responsible for coordinating, analyzing and disseminating the survey data, which took into account all of NIC.br's autonomous systems (AS) customers, covering the following themes: overall satisfaction with NIC.br's services; contact with the organization; communication; customer relations; billing; web pages; and complaints.

The questions required objective answers, and the results were used to understand the experience of the organizations assisted by NIC.br's services and the effectiveness of their communication channels. This information allows the organization to improve its processes, services and relationships with customers and users.

▷ Cetic.br and IBGE: Supporting the Brazilian Census and the Measurement of SDGs

Recognized for its experience in conducting specialized surveys for producing public statistics, Cetic.br was invited by IBGE to join the Advisory Committee for the 2020 Brazilian Census (Censo Demográfico 2020). The goal of the Committee is to monitor the various preparation and execution phases of the Brazilian Census, as well as making recommendations relative to themes such as questionnaire; experimental census; data collection methods; data processing; data collection follow-up; and results dissemination.

Within the scope of its collaboration with this institute, Cetic.br/NIC.br also participated in a meeting that gathered information producers to address the 2030 Agenda (Encontro de Produtores de Informação visando à Agenda 2030), which took place in April 2018 in its third edition. Hosted by IBGE and the Secretariat of Government of the Presidency of the Republic of Brazil (SEGOV), the event featured the participation of ENAP and the MP as well as members of the National Commission for Sustainable Development Goals (CNODS). Within the context of monitoring the 2030 Agenda in Brazil, Cetic.br has supported the production of ICT indicators in sectors such as education, the digital economy and digital government.
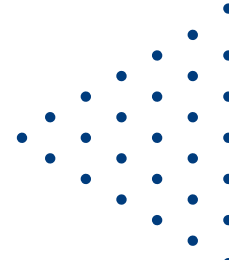
Debating the Challenges of ICT Measurement in International Forums: Sharing Experiences

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 13 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. In this context, Cetic.br/NIC.br also contributes to the construction of these recommendations and actively participates in discussions about the Indicators.

In 2018, 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.

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

October 2018 – Geneva, Switzerland

The mission of both EGH and EGTI, 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, while also meeting 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 sixth face-to-face EGH meeting occurred
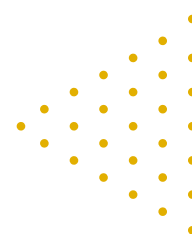
back-to-back with the ninth EGTI meeting, with the participation of 127 professionals from 54 countries, ITU-Development sector members, and other UN agencies and regional organizations.

The agenda of the meeting relative to indicators on the demand side of ICT included a discussion of indicators for themes such as child online protection, e-waste, cyberbullying, the Internet of Things, and use of the Internet on mobile phones. The methodological discussions were moderated by the manager of Cetic.br, and representatives of the Center actively contributed with two presentations. The first addressed the Center's experience with ICT indicators on child online protection. The second focused on the results of the work carried out by the EGH subgroup to review indicator HH8, location of Internet use, also coordinated by Cetic.br/NIC.br throughout the year.

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▷ 16th World Telecommunication/ICT Indicators Symposium, International Telecommunication Union

November 2018 – Geneva, Switzerland

The 16th World Telecommunication/ICT Symposium (WTIS-18) brought together more than 320 participants from 85 countries, including government ministers, business leaders, regulators, national statistical agencies, academics and ICT data producers and users from around the world, to discuss issues relative to the information society and challenges for its measurement.

The main theme of WTIS-18 was "Impact of Telecommunications/ICTs and Emerging Technologies on Social and Economic Development" and addressed new challenges for data
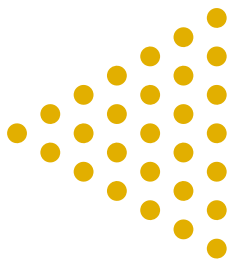
production in the context of the rise of Artificial Intelligence, Big Data, robotics and Internet of Things.

In addition to actively contributing to discussions at the event, Cetic.br/NIC.br also moderated the panel "Data Science and ICT." In the panel "Data Needs for Tracking the Social Impact of ICT", Maximiliano Salvadori Martinhão, Coordinator of CGI.br, presented Cetic.br/NIC.br's experience in the production of ICT statistics in Brazil.

COLLECTION OF ©ITU/D. WOLDU

▷ E-Commerce Week, United Nations Conference on Trade and Development

April 2018 – Geneva, Switzerland

UNCTAD's E-Commerce Week is a relevant forum for ministers, senior government officials, CEOs and other business representatives, international organizations, development banks, academics and civil society to discuss the development opportunities and challenges associated with the evolving digital economy. Under the theme "Development Dimensions of Digital Platforms," the 2018 edition explored the increasing role of digital platforms and concrete steps for harnessing these evolving technologies for sustainable development.

Cetic.br/NIC.br moderated the panel "Measuring Exports of Digitally Delivered Services," which presented data on the relevance of e-commerce in the current economy. The problem of taxation of cross-border trade, issue that raises challenges for the measurement of traditional indicators, received special mention due to the high sales volume of physical and digital products. Another highlight was the role of e-commerce in leveraging local businesses, such as the ease of using mobile technology to promote e-commerce and exchange trade information.

At this meeting, the participants sought to understand the need to harmonize statistics about e-commerce in order to reach a global perspective on the phenomenon. In this regard, special mention goes to the participation of the Center in the high-level dialogues, where decisions were made about measurements to monitor global e-commerce; there were also presentations on public policies in several countries to leverage the digital maturity of their enterprises.

PERSONAL COLLECTION
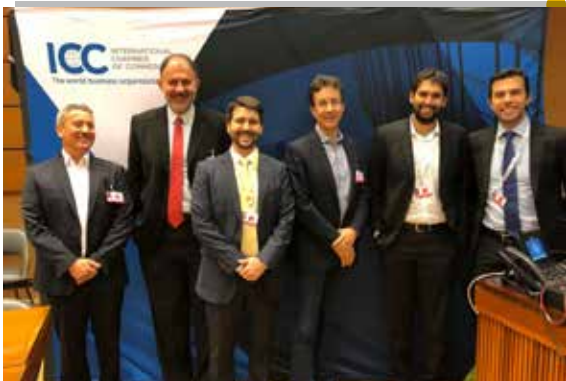
PERSONAL COLLECTION

Working Party on ICT Indicators for Measurement and Analysis of the Digital Economy, Organisation for Economic Co-operation and Development
May and November 2018 – Paris, France

Since 2010, Cetic.br/NIC.br has been a guest participant in the OECD-organized Working Party on Measurement and Analysis of the Digital Economy (WP-MADE) for ICT Indicators, aimed at sharing experiences with tools and methodologies aimed at producing data that serve as input for public policies relative to the digital economy and to evaluate their contribution to digital economy and well-being.

In 2018, WP-MADE discussed issues related to measuring the digital transformation, trust in the digital economy, online platforms, cloud computing, digital skills, cross-border e-commerce and data flows, digital security risks, Internet of Things, and Artificial Intelligence, among other topics.

SDGs & ICT

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

Given that ICT are key development enablers that may play an important role in achieving the SDGs, it is essential that all areas impacted by these technologies be measured and monitored. In this context, the Task Group on ICT for SDGs was created by the United Nations Department of Economic and Social Affairs (UNDESA) and ITU. This initiative is open to all members of the Partnership on Measuring ICT for Development and other interested agencies and stakeholders, such as Cetic.br/NIC.br. 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 in collecting internationally comparable ICT-related indicators for development.

In 2018, as a result of several online meetings and input exchanges among group participants, a first draft list of ICT indicators was presented during a session at the WSIS Forum in March 2018 in Geneva. This list of indicators remained open to feedback from WSIS stakeholders, both during and after the WSIS Forum 2018, and the task group is currently working on the final list of Indicators.

▷ Debating SDGs & Data Sources: UN World Data Forum
October 2018 – Dubai, United Arab Emirates

The second edition of the United Nations World Data Forum on Sustainable Development Data was carried out with the goal of connecting data users and producers within the scope of official and public statistics for monitoring and measuring the progress of the SDGs. The event was hosted by the Federal Competitiveness and Statistics Authority of the United Arab Emirates, with support from the Statistics Division of the UNDESA, under the guidance of the United Nations Statistical Commission and the High-Level Group for Partnership, Coordination and Capacity-Building for Statistics for the 2030 Agenda for Sustainable Development. The forum brought together around 2,000 participants that discussed the proposed indicators for the 2030 Agenda. The program was divided into different tracks, including the integration and use of non-traditional data sources, producing data and statistics to ensure visibility and a voice for everyone, capacity-building and innovation, data literacy. Among the speakers at the event was Roberto Olinto, CEO of IBGE, who spoke about the institution's experience in the panel "Opportunities and Challenges in Modernizing Statistics at the National Level".

High-Level Political Forum on Sustainable Development 2018: Transformation Towards Sustainable and Resilient Societies || Side Event: The Role of Information and Communication Technologies in the Implementation of the Targets in SDG 11

July 2018 – New York, United States

The role of ICT as critical components for local governments in facing the challenge of unprecedented urban growth in cities all over the world was the key point discussed at the UN High-Level Political Forum (HLPF) side event entitled "The Role of Information and Communication Technologies in the Implementation of SDG 11 – Make Cities and Human Settlements Inclusive, Safe, Resilient and Sustainable." Co-hosted by the SDG Academy – a program of the Sustainable Development Solutions Network (SDSN), a global initiative for the United Nations supporting the Sustainable Development Goals – along with UNESCO's Regional Bureau for Science in Latin America and the Caribbean, and NIC.br/ Cetic.br. This side event brought together high-level representatives of governments and international and civil society organizations to address the implementation of SDG 11 and its relationship to ICT and access to information.

The panel discussion featured Claudio Acioly (UN-Habitat), Chaesub Lee (ITU), Warren Feek (The Communication Initiative), Alexandre Barbosa (Cetic.br/NIC.br), Guilherme Canela Godoi (UNESCO Montevideo Office) and Eugenie Birch (SDSN). After the presentation of relevant information and available data on the implementation of SDG 11 in emerging economies in the Global South, participants discussed the opportunities and challenges of the implementation of smart and sustainable cities in the context of the 2030 Agenda. Discussion with key stakeholders outlined the role of digital technologies as an important element in the development of sustainable cities. Further, the relationship between SDG 11

(Sustainable cities and communities) and SDG 16 (Peace, justice and strong institutions), particularly regarding the role of access to information for smart cities, was also tackled by the participants. An expected result of the event was the drafting of possible lines of action for raising awareness and engaging key stakeholders regarding the role of ICT in achieving the SDGs. At the end of the panel discussion, the three institutions organizing the event launched the joint initiative 'Tech for Good' MOOC.

PERSONAL COLLECTION

> *Planning and managing sustainable urban development as called for in the SDGs is dependent on having up-to-date data on land use, transportation, housing, food and water systems and environmental conditions. We have a big task in front of us to make sure that these data are available to public and private decision makers and stakeholders as we localize the implementation of the SDGs.*
> **Eugenie Birch.**
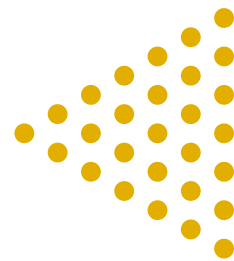
Cooperation Networks

In 2018, Cetic.br/NIC.br strengthened its cooperation efforts with regional collaboration networks to stimulate the exchange of knowledge, sharing of common frameworks for ICT data collection and, consequently, regional comparability of indicators and comparative analyses.

ICT and Health

AMERICAN NETWORK FOR COOPERATION IN ELECTRONIC HEALTH (RACSEL)

The American Network for Cooperation in Electronic Health (RACSEL) is a network for collaboration, dialogue, and sharing of knowledge and experiences with a view to developing e-health. Member countries include Uruguay, Chile, Colombia, Peru and Costa Rica. The network operates within the context of the Regional Public Goods Project for the Advancement of Electronic Medical Records in Latin America and the Caribbean of the Inter-American Development Bank.

As a result of the cooperation with RACSEL through workshop activities carried out by Cetic.br, Costa Rica published, in 2018, the results of TIC Salud, a survey on the use of ICT by the Caja Costarricense de Seguro Social (Costa Rican Social Security Fund – CCSS) in primary healthcare units. Cetic.br/NIC.br participated in the launch event, which took place during the RACSEL Ministerial Meeting and Regional Technical Dialogue in Costa Rica.

With the goal of producing comparable data, the Center has been collaborating since 2014 with other partners that are also involved in the production of indicators for ICT in the health sector, based on the document "Methodological recommendations for the measurement of access and use of ICT in the health sector". This document was recommended for Latin American and Caribbean countries by the ICT Group of the Statistical Conference of the Americas (SCA) of the ECLAC. During 2018, in partnership with the Pan American Health Organization (PAHO), these efforts resulted in the publication "Digital Health Measurement: Methodological Recommendations and Case Studies", to be published in 2019. This publication discusses the methodology developed by the SCA-ECLAC group for the production of harmonized ICT indicators in the health sector. Based on the concrete experience of countries that are carrying out research in this field, the publication provides a common conceptual and methodological framework for the promotion of comparable indicators on the subject.

▷ ICT and Children

EU KIDS ONLINE AND GLOBAL KIDS ONLINE

Since 2010, the Center has strengthened its dialogue with international networks that investigate the use of the Internet by children. The ICT Kids Online survey, carried out in Brazil since 2012 by Cetic.br, is the result of the Center's pioneering collaboration with the EU Kids Online network, which enabled adaptation of the referential framework to Brazil.

Currently, Cetic.br/NIC.br is part of the Global Kids Online project, developed as a collaborative initiative between 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 policy and practical solutions for children's well-being and rights in the digital age, especially in the Global South.

In 2018, the Center collaborated to harmonize the international databases used for the production of the project's international report to be published in 2019, which presents the main results collected by the various countries that are part of the network.

LATIN AMERICA KIDS ONLINE NETWORK

The Latin America Kids Online (LACKO) network was established in June 2015 with the aim of exchanging experiences and establishing better ways to measure Internet use among children in Latin American countries. It seeks to enhance knowledge of Latin American children's online access, opportunities, risks and safety. It uses multiple methods to map children's and parents' experience of the Internet, in dialogue with national and Latin American policy stakeholders.

The network currently includes researchers from Brazil, Chile, Costa Rica, Peru and Uruguay, and meets periodically to discuss methodological aspects and to promote cross-national data analyses. In addition to pioneering the adoption of the Kids Online methodological framework in Latin America, the marked presence of Cetic.br/NIC.br in various regional and international seminars on the topic has resulted in wide dissemination of the survey methodology and, in turn, generated multiple inquiries from countries potentially interested in implementing the survey.

In 2018, the LACKO network organized the panel "Kids Online: The Latin America Kids Online network" during the Open Science Forum for Latin America and the Caribbean 2018 (CILAC 2018), which took place in Panama in October. The panel addressed the theoretical aspects of the Kids Online framework, and presented a brief comparative analysis of indicators on ICT access and use from the Kids Online surveys in Brazil, Chile, Costa Rica and Uruguay between 2016 and 2018. It also presented specific aspects of the qualitative phase of the Kids Online Peru project.
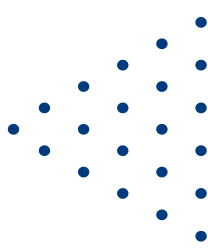
▷ ICT and Government

THE NETWORK OF e-GOVERNMENT LEADERS OF LATIN AMERICA AND THE CARIBBEAN

The Network of eGovernment Leaders of Latin America and the Caribbean (Red GEALC) brings together the region's national e-government authorities with the goal of supporting e-government policies that place citizens and, particularly, the most vulnerable populations at the center of digital government initiatives.

In March 2018, Cetic.br/NIC.br welcomed representatives from the Red GEALC Measurement Group to discuss the construction of regionally comparable indicators based on specific dimensions for e-government measurement.

SCA-ECLAC ICT GROUP

In June, Cetic.br/NIC.br attended the virtual conference "Virtual Encounter on e-Government Measurement," organized and conducted by the ICT Group of the Statistical Conference of the Americas (SCA) of ECLAC, to present the results of ICT Electronic Government survey.

▷ ICT and Education

Based on the ICT in Education survey, which has been carried out in Brazil since 2010, Cetic.br/NIC.br has worked toward the development of a methodological framework for the production of comparable statistics on the usage and adoption of ICT in educational institutions.

Cetic.br/NIC.br and the UNESCO Institute for Statistics (UIS) worked together to develop a survey guide, the "Practical Guide

for Conducting Surveys on ICT use in Primary and Secondary Schools" (to be launched in 2019), which addresses critical aspects on collecting data on ICT in education in order to construct relevant, robust, and reliable indicators that inform policy-making. Focusing on developing countries, the guide will serve as a conceptual and methodological reference for the design and implementation of ICT surveys in schools. To provide a basis for producing the guide, UIS and Cetic.br/NIC.br held an expert group meeting to discuss and review the first draft of the guide, which was carried out in May 2018 at NIC.br headquarters.

SCA-ECLAC ICT GROUP

At the virtual conference "Virtual Meeting on Measuring ICT in Education," carried out in October 2018 by the ICT Group of the SCA-ECLAC, Cetic.br/NIC.br presented key findings of the ICT in Education survey.

Dialogue with Stakeholders

ICT as a key cross-cutting technology, impacting several 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 2018, five cooperation agreements were 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 2018 that allowed for closer ties with multiple and diverse actors 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 academia, civil society and government. These experts contribute to the methodological definition and to 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 identify new fields of research, refine methodological procedures, promote the transparency of the process, and accomplish the production of robust and reliable data.

In 2018, the Center held 9 expert meetings to discuss and improve ICT in Health, ICT Households, ICT Kids Online Brazil, ICT in Education, ICT in Culture, ICT Providers, ICT Electronic Government and ICT Enterprises.

Data for Policymaking

In order to contribute toward digital inclusion in Brazil, the surveys conducted by Cetic.br/NIC.br follow the ICT policy agenda of the Brazilian government. The data produced by the Center provide input for policymaking and the development of strategies, such as:
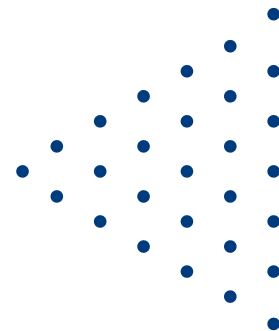
▶ **BRAZILIAN DIGITAL TRANSFORMATION STRATEGY (E-DIGITAL):**

Result of an initiative of the federal government, coordinated by the Ministry of Science, Technology, Innovations and Communications with the active participation of Interministerial Working Group members, who are responsible for its creation.

▶ **DIGITAL GOVERNANCE STRATEGY (EGD):**

A document that defines the strategic objectives, goals, indicators and initiatives of the Digital Governance policy of the Federal Executive Branch, instituted in January 2016.

▶ **CONNECTED EDUCATION INNOVATION PROGRAM (PIEC):**

The planning phase was carried out in 2017, and in 2018, effective implementation of the Ministry of Education's national program for innovation and technology in basic education began. Within the monitoring dimension, Cetic.br and the Center of Study and Research in Network Technology and Operations (Ceptro.br) worked together with the Ministry of Education (MEC) and the Lemann Foundation on a pilot test in the city of Manaus to define a strategy for measuring the quality of the Internet in schools. This resulted in the launch of an Interactive Map tool for monitoring connection quality, developed by NIC.br.

▷ Private Sector: Discussing Online Cultural Practices and Privacy Policies

In 2018, Cetic.br/NIC.br participated in activities with major private sector institutions such as Netflix, Facebook and Instagram, which are increasingly relevant stakeholders in discussions about data sources – such as Big Data – as well as discussions about privacy and online security.

In October 2018, Cetic.br was invited to participate in a Latin American meeting, organized by Netflix, to present key findings from the ICT Households 2017 survey. The Center covered relevant topics such as the main characteristics of broadband access in Brazil and highlighted cultural activities carried out online by the population, such as watching videos online. The event gathered representatives from various countries in the region and marked an important meeting between the Center and Netflix.

Furthermore, the Center was present at the Facebook LATAM Safety Summit, a meeting that brought together about 50 organizations from Latin America to discuss online safety among youths. During the meeting, the participants presented the updates made to the Facebook and Instagram privacy and data policies, which targeted the safe use of these social networking websites, especially by young people. Successful experiences of initiatives and policies that use these platforms to help users in delicate situations were also presented. These included searching for missing children and adolescents (Amber Alerts), creating support networks for people who have attempted suicide (#IAmFeeling) and developing a safe online environment for women (#ConnectionsThatSave). In addition to bringing the Center closer to important stakeholders in the private sector directly involved in online privacy debates, and, more specifically, platform security policies, the event also fostered the sharing of experiences with other organizations dedicated to this important issue.

Producing Knowledge About ICT
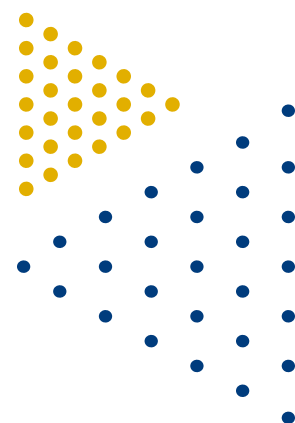
One of the Center's important lines of action is the production and sharing of knowledge about themes related to information and knowledge societies. In 2018, Cetic.br actively participated in several academic discussion forums, including presenting survey results and data analyses, debating methodological challenges, promoting thematic discussions, and proposing discussion panels with important stakeholders. Relevant events in which the Center participated in 2018 are listed below.

Culture

▶ 10th International Conference on Cultural Policy Research (Tallinn, Estonia).

▶ Networked Archives: Trends and Practices in Digital Archive Management Seminar (Rio de Janeiro, Brazil).

Childhood and Youth

▶ Challenges of a Digital Society – Opportunities and Barriers to Inclusion and Participation (Santiago, Chile).
▶ International Conference on Communication and Consumption (Comunicon 2018 – São Paulo, Brazil).

▶ 3rd Workshop on the Impacts of Exposure of Children and Adolescents on the Internet (São Paulo, Brazil).
▶ Latin America and the Caribbean Open Science Forum 2018 (CILAC 2018 – Panama City, Panama).

Digital Inequalities

▶ Communications Policy Research Latin America (CPR LATAM – Varadero, Cuba).

▶ 2018 Gender 360 Summit (New York, United States).

Education

▶ II International Conference on Communication and Education/VIII Brazilian Meeting on Educommunication (São Paulo, Brazil).

▶ III Latin American Conference on Educational Measurement and Assessment (Montevideo, Uruguay).

Health

▶ 23rd IEEE Symposium on Computers and Communications (Natal, Brazil).

Survey Techniques

▶ 18th International Free Software Forum (FISL – Porto Alegre, Brazil).
▶ Statistics Canada's 2018 International Methodology Symposium (Ottawa, Canada).

▶ 23rd National Symposium on Probability and Statistics (SINAPE – São Pedro, Brazil).
▶ We Are Developers World Congress 2018 (Vienna, Austria).

Electronic Government

▶ 19th International Conference on Digital Government (DG.O 2018 – Delft, Holland).
▶ Seminar on Measuring the Development of the Information Society: Data Production for Policy Making and Research at the United Nations University Operating Unit on Policy-Driven Electronic Governance (UNU-EGOV – Guimarães, Portugal).

Smart Cities: Technology, Urban Development and Management

Thematic Session on Smart Cities Measurement at the Open Science Forum for Latin America and the Caribbean 2018 (CILAC 2018)
October 2018 – Panama City, Panama

Created as a space for enhancing action strategies and strengthening science, technology and innovation policies in Latin American and Caribbean countries, the 2018 edition of the CILAC 2018 selected the following thematic lines of discussion: sustainable cities; new economy; and resilient territories.

Regarding sustainable cities, Cetic.br/NIC.br organized a thematic session to discuss possible paths for national and international comparability in measuring smart cities, focusing mainly on Latin American and Caribbean countries. Moderated by Matías Dodel (Research Group on the Internet of

People – IoP), the session featured participation by Ana Díaz Aldret (Public Administration Department of the Economic Research and Teaching Center – CIDE) and Guilherme Canela (UNESCO Montevideo Office), and a presentation about Cetic.br/NIC.br's experience on the topic.

The discussion emphasized the importance of considering the local context and stakeholders; and highlighted the fact that there is no single technology that is adequate for all cities, so developing a strategic plan for each city is essential, to recognize their challenges, reality, opportunities and strong points.

World Smart City Forum
November 2018 – Santa Fe, Argentina

With the goal of making smart cities a reality through common standards, the third edition of the World Smart City Forum was organized and carried out by the ITU in partnership with the International Electrotechnical Commission (IEC) and the International Organization for Standardization (ISO).

The event discussed issues related to smart cities, and consisted of four sessions that addressed the challenges inherent in the development of smart cities, the role of multiple stakeholders in these ecosystems, the importance of standards in such

initiatives, success stories and technology trends in the field. In addition to the sessions, the program included as keynote speaker the Secretary of Technologies, Management and Government of the Province of Santa Fe and presentations of researchers' works in progress.

The growth of cities and urban areas has posed a number of challenges to the promotion of environmental sustainability and to higher quality of life for citizens. Cetic.br/NIC.br was invited to participate in the first session of "Challenges in Smart-City Development," which included expert

presentations in the areas of privacy, personal data and Internet of Things. The Center underscored the challenges of developing smart city initiatives at the individual and municipal levels and measurement challenges, emphasizing that there is no standardized solution. Furthermore, smart city metrics must be formulated in such a way as to take local specificities into account. It is also important to understand that cities are using data collected via smart city initiatives to underpin public policies, because smart cities are not limited to implementing technologies in urban settings, but are mainly concerned with improving life in cities by using ICT in urban management.

▷ Policy Paper – Path to Sustainable Development of Cities: ICT Use in Urban Management

CILAC 2018 policy papers fostered the creation of regional and collective knowledge relevant to the implementation of the SDGs set by the 2030 Agenda. At the invitation of the UNESCO regional office, Cetic.br/NIC.br developed a policy paper on sustainable development, ICT and urban management.

This paper addressed how the use of ICT in urban management can open paths for urban sustainability, a goal that needs to be addressed by cities around the world. In the context of the Latin American and Caribbean region, urban growth, when aligned with the progressive use of technologies may foster an environment conducive to urban sustainability, while also posing new challenges.

Oficina de Montevideo
Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura

CILAC 2018

Caminho para o desenvolvimento sustentável das cidades: o uso das tecnologias da informação e comunicação na gestão urbana

Javiera F. M. Macaya
Tatiana Jereissati

Disaggregated Data: New Estimates by Federative Units

Within the context of policy design, there is great demand for more disaggregated ICT statistics produced on a more regular basis. The sustainable development agenda emphasizes the importance of disaggregated indicators. As a producer of public ICT statistics, Cetic.br/NIC.br has strived to provide more disaggregated information on its surveys. Currently, the surveys present disaggregated results by different variables, being that the Brazilian macro-regions are common to all the surveys.

To develop public policies related to the diffusion of the Internet and ICT, the Center was requested to produce indicators from the ICT Households survey, disaggregated by federative units. To meet this demand, Cetic.br initiated a study in 2017 with the goal of producing indicators by federative unit, combining samples and using compound estimators (which aggregate auxiliary information), with the goal of enabling reliable estimates that can be published for all federative units.

The study was concluded in 2018 and as a result, reliable estimates will be published for select indicators from the ICT Households survey in 2019, both for households and for individuals. These data will be made available with estimates for indicators from 2015 to 2017, and will be produced for upcoming editions of the ICT Households survey.

▷ Publications

INTERNET SECTOR OVERVIEW REPORT

The Internet Sector Overview Report explores themes related to technology use and access in various sectors of society and uses the data produced by Cetic.br's surveys as input for its reflection. In 2018, two editions were published, on Big Data for Development and artificial Intelligence and Ethics.

Collaborators

Big Data for Development
Emmanuel Letouzé (Data-Pop Alliance)
Roberto Olinto (IBGE)
Ronald Jansen (UNSD)

Artificial Intelligence and Ethics
Carolina Bigonha
(Hekima/Em Perspectiva)
Eduardo Magrani (ITS Rio)
Sara Rendtorff-Smith (Massachusetts
Institute of Technology)

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 2018, a publication called "Broadband in Brazil: A Study of Evolution in Access and Quality of Internet Connections" was released; carried out by Cetic.br and Ceptro.br, both part of NIC.br, the study analyzes the data collected through SIMET and various surveys conducted by Cetic.br over a four-year period (2013-2016), providing input about the quality of broadband in the country. This is the first NIC.br study that uses Big Data sources, based on information generated by users who carried out measurements using SIMET applications and devices.

▷ ICT Surveys

ICT HOUSEHOLDS

Carried out annually since 2015, 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 2017 edition, a module was implemented with the goal of measuring cultural activities on the Internet, a set of indicators that will be updated every two years. The survey carried out interviews with more than 23,000 households across Brazil.

Since the 2015 edition, all of the ICT Households micro databases and documentation have been available for download on Cetic.br's website.

Articles published in ICT Households 2017

Who are Brazilian Internet users? An analysis based on digital skills
Marcelo Henrique de Araujo & Nicolau Reinhard

Challenges in conducting research on cultural practices in the universe of new information and communication technologies
Isaura Botelho

Analysis of the allocation of public resources for providing universal Internet access in Brazil
Luciano Charlita de Freitas, Flávio Fagundes Ferreira, Humberto Bruno Pontes Silva & Leonardo Euler de Morais

Estimated demand for Internet services based on microdata from the ICT Households 2015 Survey
Mário Jorge Mendonça & José Jaime da Silva

Understanding algorithms: Properties and dilemmas
Fernanda R. Rosa

Somewhere over the rainbow: The Internet of Things and future spectrum demand
Nathalia Foditsch & Sascha Meinrath

ICT IN EDUCATION

Carried out annually since 2010, the ICT in Education survey aims to investigate ICT access, use and appropriation in Brazilian public and private elementary and secondary schools located in urban areas.

ICT in Education 2017 included 957 public and private schools, with classes in the 5th or 9th years of Elementary School and/or the 2nd year of Secondary School, located in urban areas. The survey interviewed 957 principals, 909 directors of studies, 1,810 Portuguese language, mathematics and multidisciplinary teachers, and 10,866 students.

In 2018, the ICT in Education survey completed its 8th consecutive edition, in which Cetic.br/NIC.br presented for the first time the results of ICT adoption in schools located in rural areas. The survey included 1,481 Basic Education schools: the interviews were carried out by telephone with those responsible for the teaching institutions, with 88% being principals.

Articles published in ICT in Education 2017

Teacher training and digital literacy: A correlation study on the ICT in Education databases
Aline de Mendonça Brasilino, Magda Pischetola & Carlos Alberto Quadros Coimbra

Free technological appropriation in the Bahia state public education system: The experience of educators in the Anísio Teixeira network
Yuri Bastos Wanderley

Digital games and learning environments: sociocultural challenges and pedagogical possibilities
Lynn Alves & Velda Torres Leonardo Euler de Morais

Curriculum+ platform: content, education, motivation, and learning in public schools
Camila Aparecida Carvalho Lopes, Eva Margareth Dantas & Liliane Pereira da Silva Costa

What the dreams of youth say about technology in education
Tatiana Klix

The leaking of nudes and gender: Beyond the school walls
Tatiana Jereissati, Javiera F. M. Macaya & Stefania Lapolla Cantoni

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.

In 2017, 7,062 small, medium and large enterprises were interviewed. The survey was also carried out with 1,502 microenterprises, using a questionnaire adapted for this specific audience. Previous editions of the survey specific to microenterprises were carried out by Cetic.br in 2007 and 2010.

Articles published in ICT Enterprises 2017

More efforts are needed to make e-commerce a force for development
Torbjörn Fredriksson

Industry 4.0 – emerging technologies and policy responses
Alistair Nolan & Lorrayne Porciuncula

Benefits and challenges of the digital economy for economic development
Jorge Arbache

Innovation in firms in the context of the digital transformation of the global economy: Challenges for Brazil
Cristiane Vianna Rauen

Challenges of the entrepreneurship and innovation ecosystem for the development of startups in Brazil
Felipe Matos

Corporate-startup engagement: Corporate venture capital instruments as open innovation strategies
Carlos Torres Freire & Felipe Massami Maruyama

ICT ELECTRONIC GOVERNMENT

Since 2013, the ICT Electronic Government survey investigates 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.

In 2017, interviews were conducted with 624 federal and state public organizations belonging to the executive, legislative and judicial branches, and the public prosecutor's office, and 1,062 local governments.

Articles published in ICT Electronic Government 2017

Electronic governance policy measurement, assessment and monitoring: A discussion
Delfina Soares, Wagner Araújo & Joana Carvalho

Measurement and monitoring of e-government indicators in the Latin America and the Caribbean: Proposal from the GEALC network working group
Juan Manuel Berton Schnyder

Ecology: An intelligent narrative for the protection of personal data in smart cities
Bruno Ricardo Bioni

Governance, transparency and ICT use in municipal administration
Leonardo Athias

Public value: Citizens at the center of public management
Karen M. Gross Lopes, Marie Anne Macadar & Edimara Mezzomo Luciano

Pátio digital: An open government experience and innovation in public education
Alexandre Schneider & Fernanda Campagnucci

ICT KIDS ONLINE BRAZIL

The goal of the ICT Kids Online Brazil survey is to understand how the population aged 9 to 17 uses the Internet and how they deal with risks and opportunities related to its use. ICT Kids Online Brazil is fully aligned with the methodological framework of the European network EU Kids Online.

In its sixth edition, the ICT Kids Online Brazil survey interviewed 3,102 children between the ages of 9 and 17 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 2017

Connected childhood: Digital rights and education
Chiara Spadaccini de Teffé & Carlos Affonso Souza

Children influencers on YouTube Brazil and market impact
Luciana Corrêa

Don't talk to strangers: Interactive resources and personal data processing in children's apps
Francisco Brito Cruz, Jacqueline de Souza Abreu & Maria Luciano

Online discrimination among children: the challenges of education to promote diversity on the Internet
Juliana Cunha & Rodrigo Nejm

Girls online: the perceptions of girls about online gender violence
Luísa Martins Barroso Montenegro, Luana Ferreira Alves, Amanda Calixto Silva & Larissa Gonçalves Mangabeira da Silva

What scares children on the Internet in Brazil: Responses of children in Brazil between 2012 and 2014
Zena Eisenberg, Laura Cristina Stobäus, Rosália Duarte & Clara de Melo Araujo

ICT IN HEALTH

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 fifth edition, the survey interviewed 2,336 health facility managers across the country, in addition to 1,629 physicians and 2,652 nurses affiliated with these facilities.

Articles published in ICT in Health 2017

Technological actions of the informatics department of the Brazilian unified health system for the Brazilian e-health strategy
Guilherme Telles Ribeiro, Dayanne de Mendonça Vieira, Gleide Isaac Costa Tânios Nemer & Samara Naiane Neres da Silva

Human resource education in health informatics
Heimar de Fatima Marin, Juliana Pereira de Souza Zinader & Beatriz de Faria Leão

Telehealth and Brazilian public health policies and integration of programs in Maranhão
Ana Estela Haddad, Ana Emília Figueiredo de Oliveira & Humberto Oliveira Serra

Caring for user experience in health technologies
Lucia Vilela Leite Filgueiras

Blockchain in healthcare
John D. Halamka

Leveraging electronic health records: Secondary analysis to improve patient care
Ary Serpa Neto, David J. Stone, Leo Anthony Celi, Lucas Bulgarelli & Rodrigo Octávio Deliberato

ICT IN CULTURE

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 archive digitization. It also presents information about IT management in these institutions and how the perception on the contributions and challenges of computer and Internet use in cultural facilities.

ICT NONPROFIT ORGANIZATIONS

The ICT Nonprofit Organization 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 PROVIDERS

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 interviewed 2,177 provider services.

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Lima, L. (2018). Práticas culturais on-line e plataformas digitais: desafios para a diversidade cultural na internet. Revista do Centro de Pesquisa e Formação/ SESCSP, 7, 74-89.

Lima, L. & Senne, F. (2018a). Cultura e tecnologias no Brasil: Um estudo sobre as práticas culturais da população e o uso das tecnologias de informação e comunicação. Trabalho apresentado no IX Seminário Internacional de Políticas Culturais, 15-18 de maio (pp 96-109). Fundação Casa de Rui Barbosa, Rio de Janeiro, Brasil.

Macaya, J. F. M., Jereissati, T., Cantoni, S. L. & Barbovschi, M. (2018). Los desafíos y contradicciones en las percepciones sobre privacidad entre los adolescentes brasileños. Artículo presentado en la 11th CPR Latam Conference, 14-15 de junio (pp. 221-228). Varadero, Cuba.

Portilho, L.; Senne, F. & Barbosa, A. (2018). Health and Digital Technologies: Access to and Use of ICT Among Brazilian Healthcare Facilities. Paper presented at the 2018 IEEE Symposium on Computers and Communications (ISCC), June 25-28th (pp. 1181-1186). Natal, Brasil.

Ribeiro, M. M., Cunha, M. A. & Barbosa, A. F. (2018). E-participation, social media and digital gap: challenges in the Brazilian Context. Paper presented at the dg.o '18 Proceedings of the 19th Annual International Conference on Digital Government Research: Governance in the Data Age, Delft, May 30th - June 01st (Article 87, pp. 1-9). Delft, The Netherlands.

Senne, F. (2018). Espaço e inclusão digital na cidade de São Paulo: uma análise desde a perspectiva da multidimensionalidade das desigualdades sociais e territoriais. Trabalho apresentado na 11th CPR Latam Conference, 14-15 de junio (pp. 173-184). Varadero, Cuba.

PRESENTED PAPERS

Lima, L. & Senne, F. (2018b). Culture and technologies in Brazil: a study on the cultural practices of the population and the use of information and communication technologies (ICT). Paper presented at the 10th International Conference on Cultural Policy Research, August 21-25th. Tallin University, Estonia.

Lima, L. & Senne, F. (2018c). ICT in Culture: Use of Information and Communication Technologies in Brazilian Cultural Facilities. Paper presented at the 10th International Conference on Cultural Policy Research, August 21-25th. Tallin University, Estonia.

Lima, L. & Senne, F. (2018d). TIC Cultura: O uso das tecnologias de informação e comunicação nos equipamentos culturais brasileiros. Trabalho apresentado no XIV ENECULT – Encontro de Estudos Multidisciplinares em Cultura, 7-10 de agosto. Universidade Federal da Bahia (UFBA), Salvador, Brasil.

Martins Junior, J. M., Pitta, M. T., Dias, J. V. P. & Silva, P. L. N. (2018). Web Scraping as a alternative data sources to predict E-Commerce indicators. Paper presented at the Statistics Canada's 2018 International Methodology Symposium, November 6-9th. Ottawa, Canadá.

Pizzott, M. R. S., Pitta, M. T. & Silva, D. B. N. (2018). Indicadores de representatividade na pesquisa sobre o uso das tecnologias de informação e comunicação nos domicílios brasileiros. Trabalho apresentado no 23º Simpósio Nacional de Probabilidade e Estatística (SINAPE), 23-28 de setembro. São Pedro, Brasil.

BOOK CHAPTERS

Barbovschi, M.; Jereissati, T., Macaya, J. & Cantoni, S. L. (2018). Percepciones sobre privacidad entre los adolescentes brasileños: Desafíos y contradicciones. In

Cobo, C.; Cortesi, S.; Brossi, L.; Doccetti, S.; Lombana, A.; Remolina, N.; Winocur, R., & Zucchetti, A. (Eds.). Jóvenes, transformación digital y nuevas formas de inclusión en América latina (pp. 335-344). Montevideo, Uruguay: Penguin Random House.

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Costa, D. & Senne, F. (2018). Políticas de inclusão digital de crianças e adolescentes a partir da escola: o que dizem os estudantes? In Centro de Estudios Fundación Ceibal. In Cobo, C.; Cortesi, S.; Brossi, L.; Doccetti, S.; Lombana, A.; Remolina, N.; Winocur, R. & Zucchetti, A. (Eds.). Jóvenes, transformación digital y nuevas formas de inclusión en América latina (pp. 103-112). Montevideo, Uruguay: Penguin Random House.

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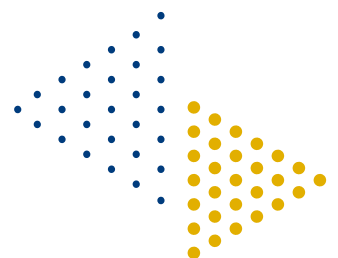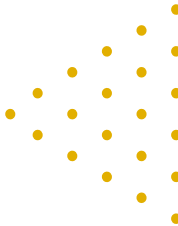**Coordination of Process and Quality Management**
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