2024 Annual Report
Cetic.br
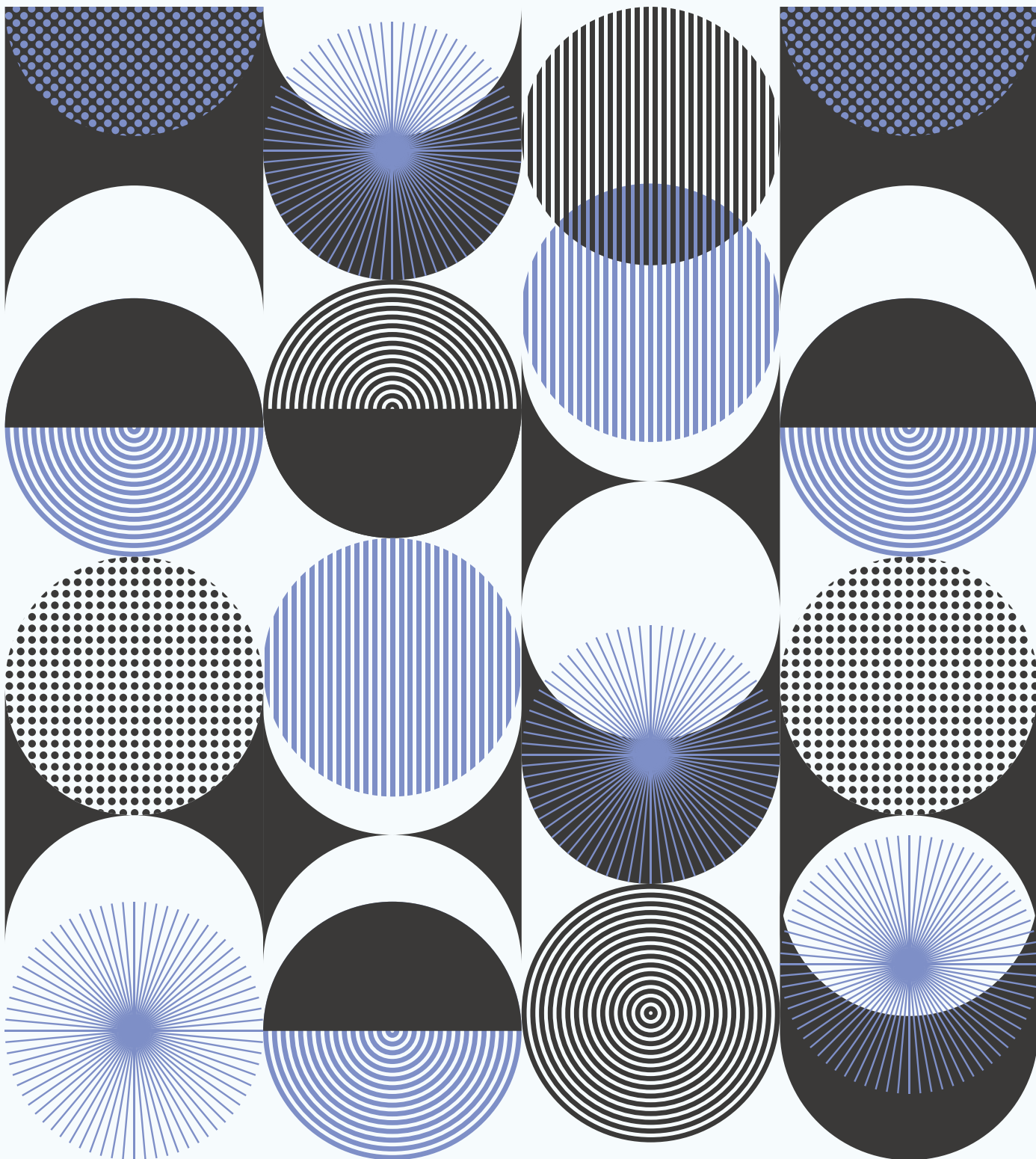
About CGI.br

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 dissemination of Internet services.
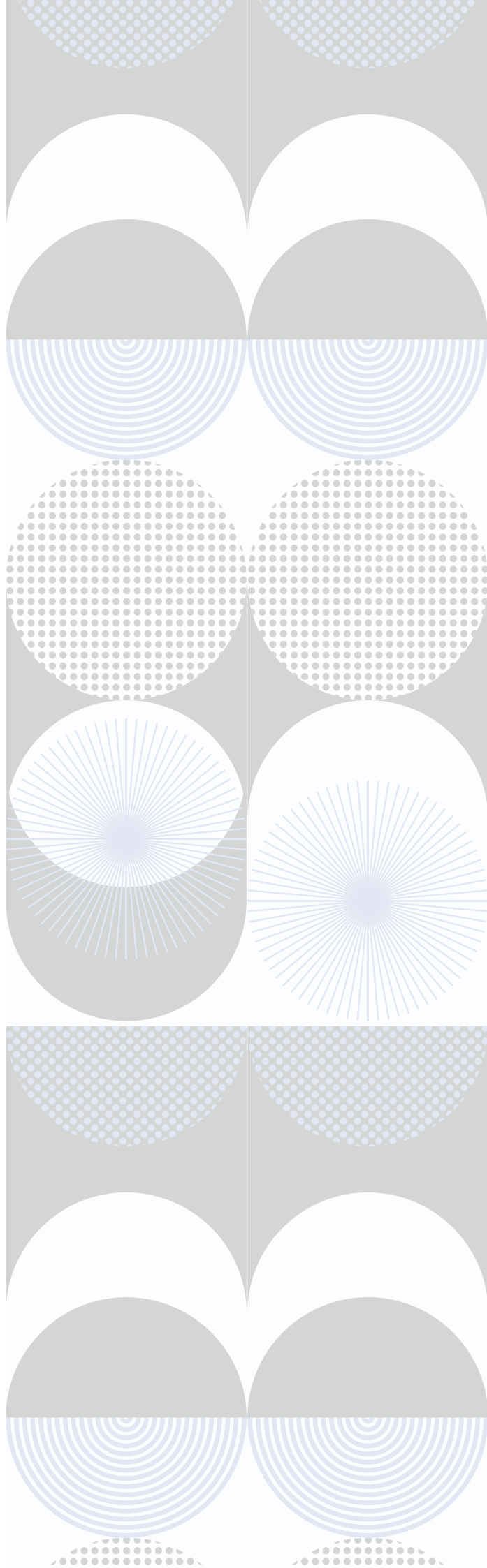
About NIC.br

The Brazilian Network Information Center (NIC.br) was created to implement the decisions and projects of the CGI.br.

About Cetic.br

The Regional Center for Studies on the Development of the Information Society (Cetic.br) is the NIC.br department responsible for producing indicators and statistics on the availability and use of the Internet in Brazil. In 2012, Cetic.br|NIC.br was approved as a UNESCO Category 2 Centre with the mission of monitoring the development of knowledge and information societies in Latin America and the Portuguese-speaking countries of Africa.

Content

Message from the CEO

As we present the 2024 Annual Report for the Regional Center for Studies on the Development of the Information Society (Cetic.br), we celebrate two decades dedicated to producing indicators and analyses on the adoption of information and communication technologies (ICT) in Brazil. I am pleased to highlight the key milestones and contributions that have shaped our work over the past year. They reinforce our commitment to generating robust data and analysis, which are essential for understanding the digital transformation and its impact on society.

The growth and development of the Internet and digital technologies in the last two decades have been accompanied by technical, political, and regulatory challenges, requiring evidence-based responses and multistakeholder dialogue. The Brazilian Network Information Center (NIC.br), which manages the .br domain registry and promotes the continuous improvement of the country's Internet infrastructure, plays a key role in this landscape.

The country code Top-Level Domain (ccTLD) for Brazil, .br, holds a privileged position as the sixth largest country-code domain registry in the world and the preferred choice for Brazilian businesses, recognized for its high-quality services and reliability. This strong foundation enables NIC.br to fund four research centers using resources from Brazil's Internet domain name registry. One of them is Cetic.br|NIC.br, which continuously allocates resources to the production of reliable statistics, providing essential data to support public policies, academic research, and strategic decision-making.

In 2024, our work has been marked by initiatives centered on the development of the digital economy, Artificial Intelligence (AI), and meaningful connectivity, strengthening Cetic.br|NIC.br's role as a relevant voice in global discussions of statistics for monitoring the digital transformation. A notable example was our engagement in the G20 Digital Economy Working Group (DEWG) during Brazil's G20 presidency. Cetic.br|NIC.br contributed to three strategic reports: one on AI development in G20 countries, another on AI adoption in public services in partnership with the Ministry of Science, Technology, and Innovation (MCTI) and United Nations Educational, Scientific and Cultural Organization (UNESCO), and a third, developed with the Ministry of Communications (MCom) and the International Telecommunication Union (ITU), on a framework for measuring meaningful connectivity.

Additionally, Cetic.br|NIC.br played a pivotal role in establishing the Brazilian Artificial Intelligence Observatory (OBIA), hosted at NIC.br, becoming a key provider of data and statistics on AI adoption across various sectors. The Observatory acts as a central repository for relevant key statistical data on AI adoption, as well as key documents and research. The study *Artificial Intelligence in Healthcare: Potential, Risks, and Perspectives for Brazil*, which employed an innovative approach to understanding the AI landscape in health care, was the first study released within the OBIA framework. Cetic.br|NIC.br also played an active role in the ongoing discussions about the Latin America AI Index.[1]

Cetic.br|NIC.br remains committed to the challenge of quantifying the societal impacts of emerging digital technologies. We strive to develop innovative methods that integrate various data sources and types, aiming to provide a comprehensive understanding of the socioeconomic consequences of digital advancements.

In addition to our standard national ICT surveys and sector-specific reports, in 2024 Cetic.br|NIC.br made a significant contribution
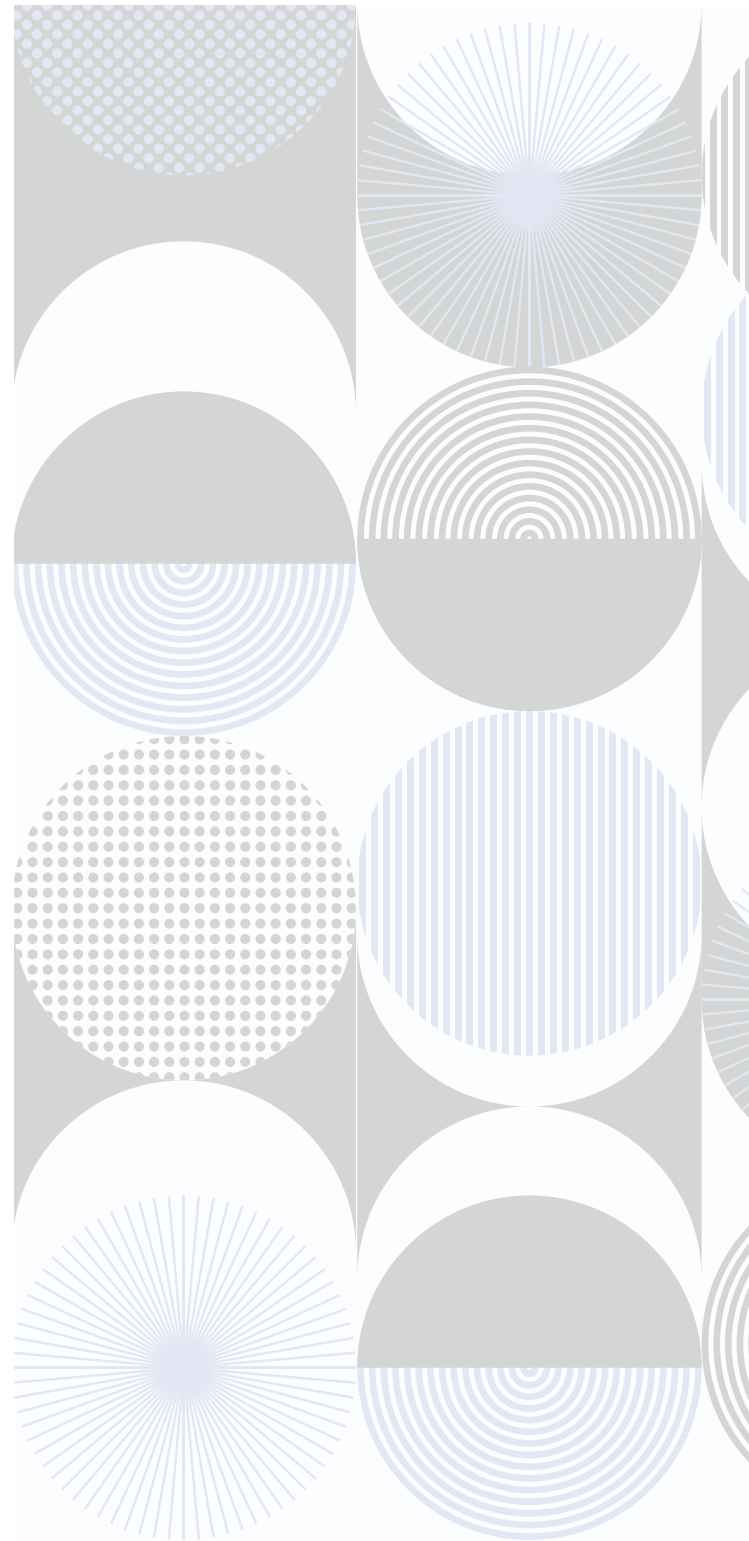
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1   For more information on the Latin American Artificial Intelligence Index, see https://indicelatam.cl/home-en/

with its new study on meaningful connectivity, producing data for policymaking and supporting countries in the Latin America and the Caribbean (LAC) region in close collaboration with the United Nations Economic Commission for Latin America and the Caribbean (ECLAC) to conduct national studies. Our capacity-building efforts in ICT measurement in partnership with strategic partners, such as ECLAC, the Latin American Development Bank for Latin America and the Caribbean (CAF), the National School of Statistical Sciences (ENCE/IBGE), and Inter-American Development Bank (IDB), have focused on disseminating expertise and success stories in ICT statistics and evidence-based policymaking.

Cetic.br|NIC.br has also actively contributed to revising UNESCO's Internet Universality Indicators (IUI) and continues to offer technical support to countries implementing national assessments. In collaboration with UNESCO, the Center played a pivotal role in the year-long comprehensive revision of the IUI framework, culminating in the launch of the updated *Internet Universality: Advancing Inclusive Digital Transformation with ROAM-X Indicators*[2] during the Internet Governance Forum (IGF) in December 2024.

As we look ahead, Cetic.br|NIC.br remains committed to advancing the production of high-quality data and analyses that drive evidence-based policymaking and deepen our understanding of the digital transformation. Through collaboration, innovation, and rigorous research, we will continue to support a more inclusive, ethical, and data-driven digital society, ensuring that technology serves as a catalyst for sustainable development and societal progress. This mission is made possible by the dedication of our staff, the support of our valued partners, and the expertise of a vast and multistakeholder network of collaborators. Together, we harness the transformative power of data to inform policies, foster innovation, and shape a digital future built on inclusivity, integrity, and collective well-being.

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

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2   More information at https://www.unesco.org/en/articles/unesco-launch-revised-internet-universality-framework

2024 Highlights

In 2024, the Regional Center for Studies on the Development of the Information Society of the Brazilian Network Information Center (Cetic.br|NIC.br) strengthened its role as a leader in the production of high-quality statistical data and analyses on the evolving digital landscape in Brazil. Rapid advancements in emerging technologies, particularly Artificial Intelligence (AI), have accelerated the digital transformation, reshaping socioeconomic structures. This shift demands reliable data to capture trends and support evidence-based decision-making.

In this context, Cetic.br|NIC.br has proactively adopted innovative methodologies to tackle measurement challenges and adopt robust methodological frameworks for monitoring the digital transformation and its societal impacts. This year was marked by efforts focused on integrating multi-method approaches and leveraging multiple data sources. By combining quantitative and qualitative methods and incorporating alternative Big Data sources, Cetic.br|NIC.br produced more comprehensive analyses and enhanced its ability to inform digital policies effectively.

Over the course of the year, the Center published a total of 14 publications. They included eight national surveys on information and communication technologies (ICT), which provided critical insights into access to and use of digital technologies across various population groups and sectors; two thematic sectoral studies that delved deeper into specific areas such as AI in the health sector and meaningful connectivity; and four editions of the Internet Sectoral Overview (ISO), which offered a broader analysis of trends, challenges, and developments in the Internet ecosystem. Among these, a key highlight of the year was the development of two sectoral studies: *Meaningful Connectivity: Measurement Proposals and the Portrait of the Population in Brazil* and *Artificial Intelligence in Healthcare: Potential, Risks, and Perspectives for Brazil*.

The first sectoral study represented a significant milestone, contributing to global discussions of digital inclusion. It was developed using existing literature, including references from the Alliance for Affordable Internet (A4AI), the Global Digital Inclusion Partnership (GDIP), and the International Telecommunication Union (ITU). It drew on data from the Brazilian ICT Households survey and introduced a conceptual and analytical framework for measuring meaningful connectivity among the population. The study identified nine indicators across four key dimensions: affordability, access to equipment, quality of connections, and the overall connectivity environment. Grounded in international methodological references and supported by a long historical data series, the framework allows for both retrospective analysis of the country's progress and continuous monitoring moving forward. Overall, these indicators offer a comprehensive view of the levels of meaningful connectivity in a particular country or region.

The second sectoral study, launched during the first seminar of the Brazilian Artificial Intelligence Observatory (OBIA) in September 2024, mapped the current state of AI adoption in Brazil's healthcare sector. Using a qualitative approach, it explored opportunities, challenges, risks, policy issues, and the impacts of AI in clinical practice. The study was divided into two parts: expert articles on literature and regulation, and a series of interviews with key stakeholders involved in AI development and implementation in health care.

The ISO series continued to provide in-depth analyses of pressing digital issues, with themes ranging from AI's impact on the labor market to the intersection of technology and public services.

In 2024, Cetic.br|NIC.br continued its efforts to collect indicators on the adoption and use of AI across various sectors of the Brazilian economy, including education, health care, enterprises, and public administration. This

work represents a significant contribution to the OBIA,[3] particularly in supporting one of its key pillars: the creation of a repository of statistical data on AI adoption in Brazil. The Observatory is an initiative aimed at compiling, organizing, and providing information on the development of AI-enabling technologies, supporting analysis of their adoption and societal impacts. It is part of Axis 5 of the Brazilian Artificial Intelligence Plan (PBIA),[4] aiming to consolidate and disseminate knowledge of AI's social impacts, serving as a cooperative, multidisciplinary reference observatory to guide public policy, strategy, and responsible AI development.

In 2024, Cetic.br|NIC.br played a strategic role in supporting the Brazilian presidency of the G20, particularly within the Digital Economy Working Group (DEWG). Aligned with the priorities set forth by the Brazilian government, the Center contributed with the development of three publications that brought evidence-based contributions to international digital policy debates. Two of these publications focused on the multifaceted development and governance of AI, produced in collaboration with Ministry of Science, Technology and Innovation (MCTI), the National Data Protection Authority (ANPD), and United Nations Educational, Scientific and Cultural Organization (UNESCO). Drawing on international datasets and on a survey submitted to G20 countries, it provided a comprehensive analysis of countries' readiness and capacity to adopt AI technologies responsibly and equitably. Additionally, Cetic.br|NIC.br advanced the G20 agenda on digital inclusion by co-developing the report *Universal and Meaningful Connectivity: A Framework for Indicators and Metrics*, in partnership with the ITU and Ministry of Communications (MCom). The inclusion of this framework in the G20 Digital Economy Declaration reinforced the centrality of robust, inclusive data in shaping policies that ensure equitable access to the benefits of the digital transformation.

ICT Measurement Through National Surveys

Throughout 2024, Cetic.br|NIC.br conducted comprehensive ICT surveys covering households, education, health, government, enterprises, and children in the digital environment. These surveys revealed key trends such as increasing digital inclusion among marginalized groups, growing concerns around data privacy, and shifts in digital skill acquisition.

Notably, the ICT in Health 2024 survey provided the most detailed dataset to date on AI applications in healthcare facilities, shedding light on the opportunities and risks of AI-driven diagnostics and administrative processes. Similarly, the ICT in Education study continued to track digital technology adoption in schools, emphasizing the role of connectivity in achieving learning outcomes.

Public Debates and Global Engagement

In 2024, Cetic.br|NIC.br reaffirmed its ongoing initiatives in promoting informed public debate and international cooperation on the social, economic, and cultural dimensions of the digital transformation. The Center actively participated in major global forums, including G20 DEWG dialogues under the Brazilian presidency, and those led by UNESCO, United Nations Conference on Trade and Development (UNCTAD), and the Organisation for Economic Co-operation and Development (OECD), bringing technical expertise to international discussions on ICT statistics and data governance.

At the national level, Cetic.br|NIC.br organized and supported a wide range of public events and expert group meetings involving government

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3   For more information on OBIA, visit https://obia.nic.br/

4   For more information on PBIA, visit https://www.gov.br/lncc/pt-br/assuntos/noticias/ultimas-noticias-1/plano-brasileiro-de-inteligencia-artificial-pbia-2024-2028

representatives, academia, the private sector, civil society, and international organizations. These gatherings fostered interdisciplinary and multistakeholder dialogue on issues related to access to, use of, and appropriation of digital technologies by different segments of society. Several of these events were held to mark the launch of new publications, particularly findings from national ICT surveys, and served as platforms for critical reflection on the impacts of digital technologies.

Through these initiatives, Cetic.br|NIC.br promotes transparency in its data production processes and strengthens its role as a catalyst for public dialogue and global engagement in the construction of inclusive and knowledge-based information societies.

Capacity-Building and Knowledge Dissemination

In line with its mission to empower stakeholders with data-driven insights, Cetic.br|NIC.br expanded its capacity-building initiatives, including Massive Open Online Courses (MOOC) on digital transformation and AI governance. The School of Digital Transformation and Innovation in Latin America and the School of Digital Transformation and Innovation in the Caribbean further strengthened regional cooperation by fostering discussions on meaningful connectivity, cybersecurity, and digital inclusion. In addition, the Center organized the 14th NIC.br Annual Workshop on Survey Methodology, bringing together experts to discuss innovative approaches to data collection and analysis.

Looking Ahead

In a year marked by relevant projects, Cetic.br|NIC.br further solidified its role as a reference institution in ICT measurement, policy support, and public debate. By advancing methodological innovation, promoting interdisciplinary collaboration, and

strengthening international partnerships, the Center has not only expanded its production of high-quality data and analyses but also deepened its impact on national and global digital agendas.

Its active participation in the Brazilian G20 presidency, provision of data to the OBIA, and publication of landmark sectoral studies on AI in health and meaningful connectivity underscore Cetic.br|NIC.br's commitment to evidence-based policymaking. Through comprehensive ICT surveys, targeted capacity-building efforts, and multistakeholder dialogues, the Center has enabled a better understanding of how different segments are affected by digital technologies.

Looking ahead, Cetic.br|NIC.br remains committed to deepening its engagement with key international organizations and regional partners. As countries across the regions covered by the Center continue to navigate the complex challenges and opportunities of the digital transformation, Cetic.br|NIC.br will play a vital role in fostering an inclusive digital future. By generating reliable data to inform public policies, the Center contributes to building more equitable, informed, and resilient digital societies.

❝ *At Cetic.br|NIC.br, we transform data into knowledge to inform public policies, foster inclusive digital development, and guide the responsible use of technology in society. Through research, collaboration, and dialogue, we help shape a more equitable and connected digital future.* ❞

Alexandre Barbosa

Head of the Regional Center for Studies on the Development of the Information Society (Cetic.br|NIC.br)

2024 Facts & Figures

657
Field interviewers involved
in data collection

31
Field coordination
supervisors

14
Publication of ICT surveys,
NIC.br Sectoral Studies & Internet
Sectoral Overview

43,482
Interviews carried out in all
of Cetic.br|NIC.br's surveys

418
Indicators published

313
External experts involved
in ICT survey projects

8
Expert meetings
(multistakeholder groups)

4,866
Media appearances

1
New cooperation agreements
signed in 2024

10
Number of cooperation
agreements in force

10,409 views
Webinars and public debates
organized by Cetic.br|NIC.br

8,266
registered individuals
MOOC: Tech for Good: The Role of
ICT in Achieving the SDGs and the AI
and the Rule of Law

235
participants
Capacity-building and workshops on
research methodologies[5]

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5   The participants were enrolled in the following capacity-building workshops: NIC.br
Annual Workshop on Survey Methodology, School of Digital Transformation and Innovation in Latin
America, and School of Digital Transformation and Innovation in the Caribbean.
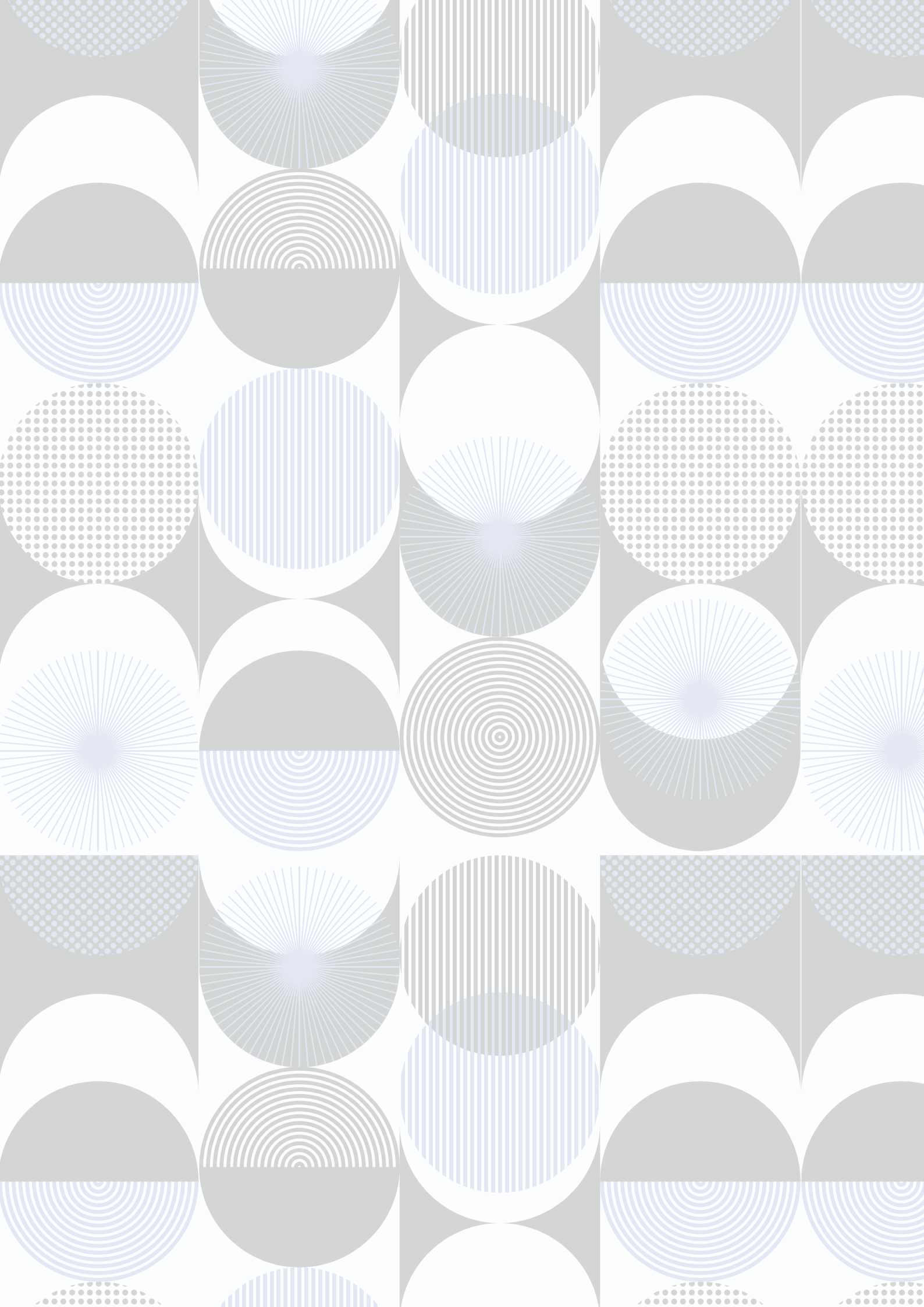
Publications

The production of high-quality statistical data to monitor access to and use and appropriation of information and communication technologies (ICT) is a central activity developed by Regional Center for Studies on the Development of the Information Society of the Brazilian Network Information Center (Cetic.br|NIC.br). The Center carries out a set of five annual ICT survey projects—related to households, education, health, enterprises, and children—in addition to regular surveys with other periodicities—including electronic government, cultural facilities, nonprofit organizations, and Internet service providers. Besides regular surveys, Cetic.br|NIC.br publishes other studies related to the challenges to digital technology adoption among individuals and organizations using quantitative and qualitative approaches. These projects cover critical areas for monitoring the development of knowledge and information societies, while also generating relevant data for monitoring the Sustainable Development Goals (SDG) and targets outlined by the United Nations (UN) in its 2030 Agenda for Sustainable Development.

Publications index

ICT Households

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

In this edition, the survey highlighted an increase in the proportion of households with Internet access and Internet users. This was mainly driven by an increase in connectivity in the households of classes C and DE and by the use of the Internet among women. The results also indicated that Internet access in Brazil continues to advance, but that the quality of this access is still very unequal, which impacts the activities carried out online and, consequently, the access to tangible outcomes derived from meaningful Internet use. Interviews were conducted in 23,975 households and with 21,271 individuals across the country. Data collection was carried out by face-to-face interviews between March and July 2023.

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

Articles published in ICT Households 2023

Incorporating the Digital Dimension into Inaf: Premises, Challenges and Proposals for Implementation
Ana Lúcia D'Império Lima, Heloísa Trenche Belusci, & Jacqueline Peixoto Barbosa

After Access 2022-2024: Digital Inequalities in Africa
Andrew Partridge

Digital Competence in Brazil
Liane Margarida Rockenbach Tarouco, Patrícia Fernanda da Silva, & Teresinha Letícia da Silva

Artificial Intelligence in the Public Interest: Identifying Internet Access Technology
Solimary García Hernández, Paulo Kuester Neto, Gabriela Lima Marin, & Cristiane Millan
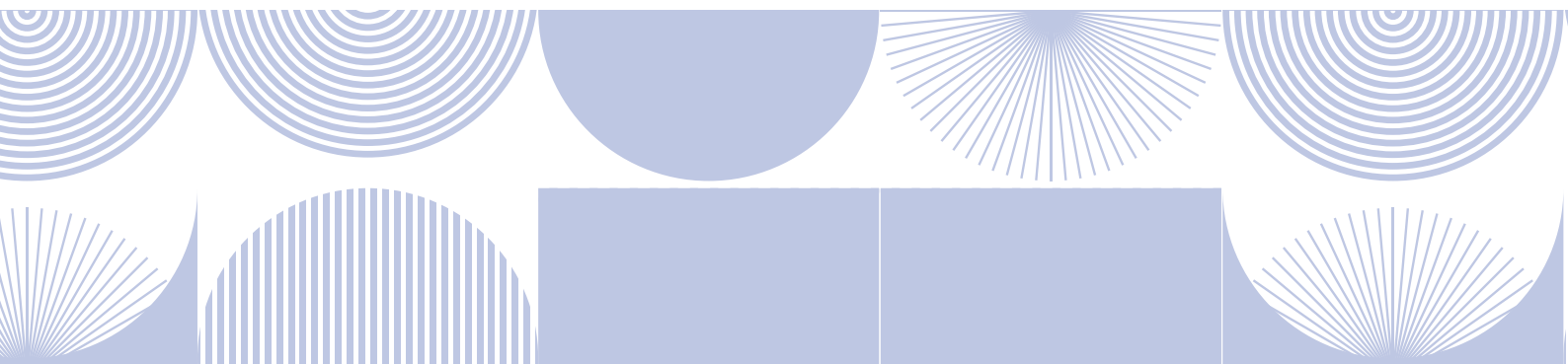
INTERNET USERS (2008-2023)

Total population (%)

Year	Value
2008	34
2009	39
2010	41
2011	46
2012	49
2013	51
2014	55
2015	58
2016	61
2017	67
2018	70
2019	74
2020	81
2021	81
2022	81
2023	84
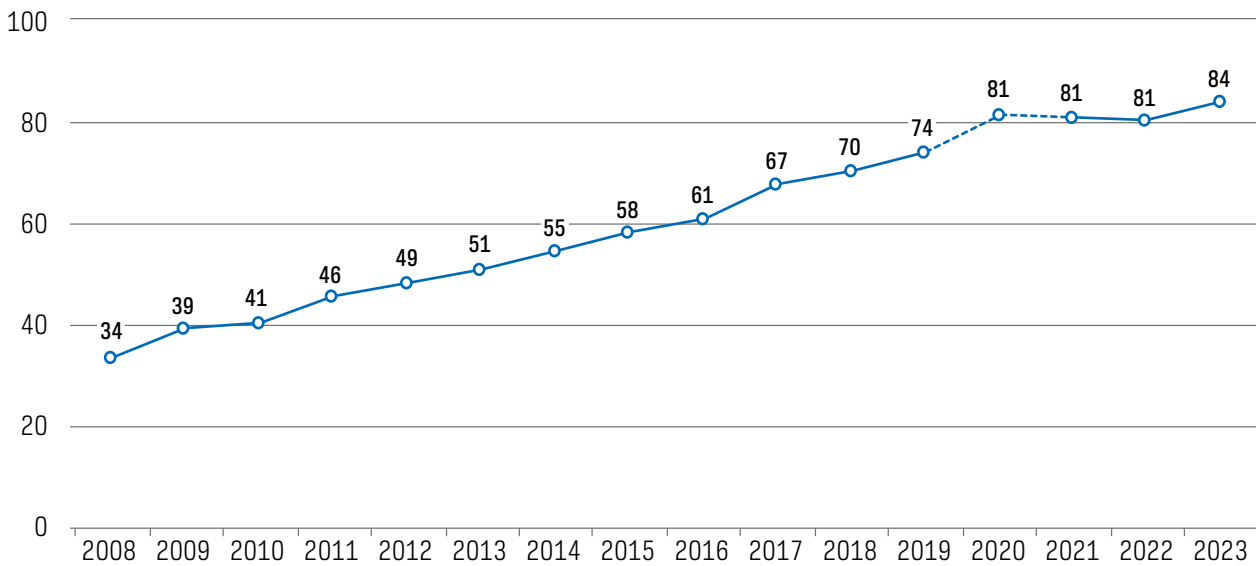
INTENSIFICATION OF INTERNET USE

156 million Internet users (84% of population), of which…

92%
sent instant messages

54%
made payments or other financial transactions online

34%
listened to podcasts

INDIVIDUALS BY ORIGIN OF MUSIC, MOVIES, AND TV SERIES ACCESSED ONLINE, BY LEVEL OF EDUCATION (2023)

Total population (%)

Music

	Illiterate/Preschool	Elementary	Secondary	Tertiary
Brazilian	18	53	71	81
Foreign	3	23	42	64

Movies

	Illiterate/Preschool	Elementary	Secondary	Tertiary
Brazilian	8	33	52	59
Foreign	4	26	52	68

TV series

	Illiterate/Preschool	Elementary	Secondary	Tertiary
Brazilian	5	25	43	43
Foreign	3	25	51	64

Legend:
- Illiterate/Preschool Education
- Elementary Education
- Secondary Education
- Tertiary Education

ICT Kids Online Brazil

The goal of the ICT Kids Online Brazil survey is to understand how the population of 9 to 17 years old uses the Internet and how they deal with risks and opportunities related to its use. It is fully aligned with the methodological framework of the Global Kids Online network and the Latin America Kids Online network.

The 2023 edition of the survey showed an increase in the frequency of online participation and that children's first access to the Internet is taking place at an earlier age. This increases the challenges of guaranteeing their privacy and safety, as well as digital environments that do not pose risks to their well-being. In this edition, data collection took place between March and July 2023. 2,704 children and 2,704 parents or legal guardians were interviewed nationwide.

Since the 2015 edition, the micro databases and documentation of the ICT Kids Online Brazil survey have been available for download on Cetic.br|NIC.br's website.

Articles Published in ICT Kids Online Brazil 2023

Metaverse and Childhood: Proposals for the Protection of Children's Data
Chiara Spadaccini de Teffé

Recommendations for the Safe Use and Protection of Children's Personal Information
Miriam von Zuben

Digital Citizenship: Participation and Safety of Preadolescents on the Internet
Velda Torres

Children's Participation in Digital Citizenship
Claudemir Edson Viana, Fernanda Simplício dos Santos, & Marcelo Augusto Pereira dos Santos

CHILDREN BY AGE OF FIRST ACCESS TO THE INTERNET (2015-2023)

Total number of Internet users 9 to 17 years old (%)

Year	Up to 6 years old	7-9 years old	10-12 years old	More than 12 years old	Does not know/Did not answer
2023	24	27	24	7	19
2015	11	25	36	15	13
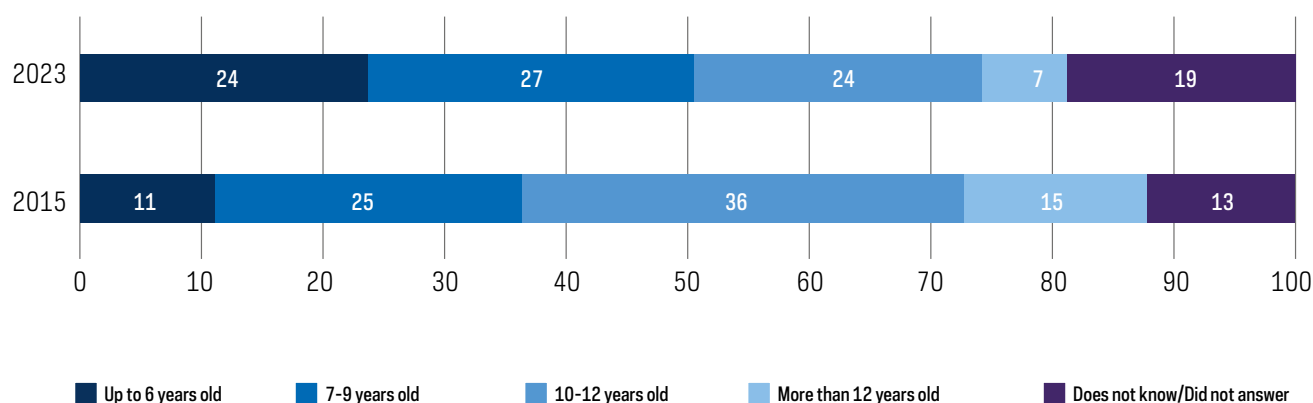
Regarding the digital skills of children 11 to 17 years old...

50%	**47%**	**40%**
agree that the first post they see on social networks is the last one that was posted by one of their contacts	agree that everyone finds the same information when they search for things on the Internet	agree that the first result of an Internet search is always the best source of information

CHILDREN BY ACTIVITIES CARRIED OUT ON THE INTERNET – EDUCATION AND SEARCHING FOR INFORMATION (2023)

Total number of Internet users 9 to 17 years old (%)

Activity	Total	Only mobile phones	Computers and mobile phones
Looked up information for schoolwork	82	79	88
Looked up information out of curiosity or own will	66	58	81
Read or watched the news	60	60	62
Used maps	39	34	49
Looked up health information	35	31	41
Looked up information regarding job opportunities or courses	28	27	32
Looked up information regarding what is happening in the place where they live, on their street or neighborhood	26	24	32

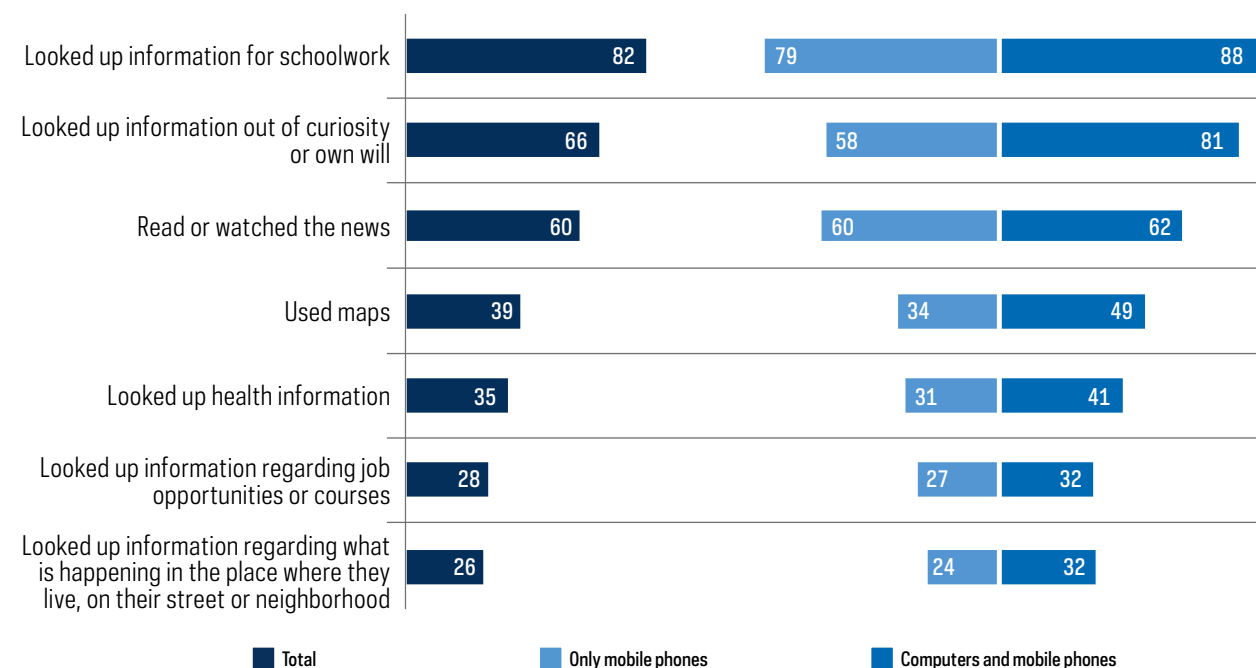## CHILDREN BY TYPES OF ONLINE ADVERTISING ABOUT PRODUCTS OR BRANDS SEEN, BY AGE GROUP (2023)

Total number of Internet users 11 to 17 years old (%)

	11 to 12 years old	13 to 14 years old	15 to 17 years old
People teaching how to use products	38	58	73
Unboxing	47	58	66
People showcasing products given by brands	34	58	68
People carrying out challenges or playing with products or brands	43	51	51
People going to stores or events to showcase products or brands	29	42	60
Prize drawings or contests for products or brands	15	31	55

ICT in Education

Carried out annually since 2010, the ICT in Education survey aims to investigate ICT access, use, and appropriation by students, educators, and school managers in Brazilian public and private primary and secondary educational institutions located in urban and rural areas.

The 14th edition of the ICT in Education survey presented indicators on connectivity and use of digital technologies in primary and secondary schools; mediation of the use of digital technologies by students; adoption of digital systems by schools; presence of schools on platforms or social networks; privacy and data protection; school management; and continuous professional development on digital technologies, among other indicators. The data allow for understanding the ways in which digital technologies permeate pedagogical practices, teaching and learning processes, and decision-making in the management of primary and secondary education schools in Brazil. The data collection took place between August 2023 and April 2024, using the computer-assisted telephone interviewing (CATI) technique. A total of 3,001 interviews were carried out with managers of primary and secondary education schools.

Articles published in ICT in Education 2023

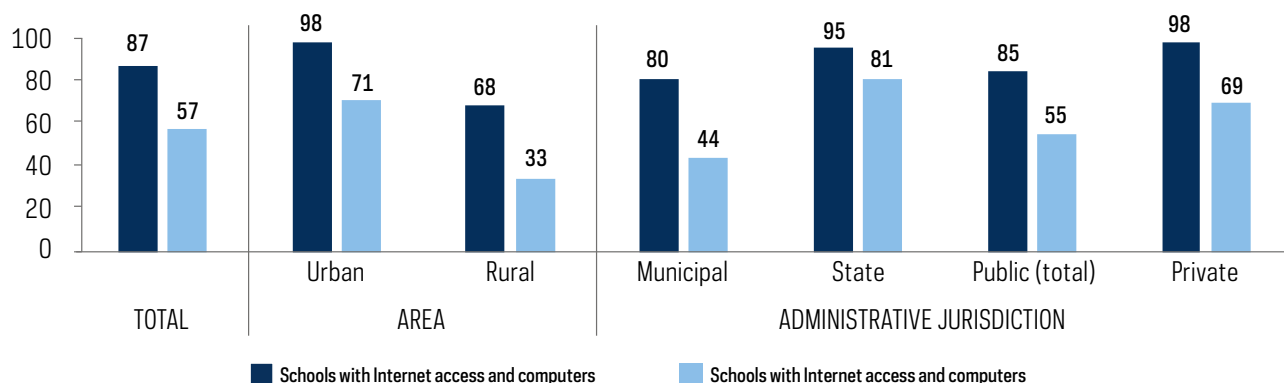**The Need for Data Justice in Education**
Luci Pangrazio

Data Literacy in Primary and Secondary Schools
Judy Robertson

Self-Assessment of Basic Education Teachers' Digital Skills: An Experience Report of a Digital Citizenship Training Course
Bianca Orrico Serrão, Guilherme Alves, & Isabella Ferro

Surveillance in Education: The Impact of Inequality on the Violation of Privacy
Thaís Rugolo & João Coelho

SCHOOLS BY PRESENCE OF INTERNET ACCESS AND COMPUTERS FOR STUDENT USE (2023)

Total number of primary and secondary education schools (%)

	TOTAL	Urban	Rural	Municipal	State	Public (total)	Private
Schools with Internet access and computers	87	98	68	80	95	85	98
Schools with Internet access and computers	57	71	33	44	81	55	69

TOTAL — AREA — ADMINISTRATIVE JURISDICTION

■ Schools with Internet access and computers   ■ Schools with Internet access and computers

SCHOOLS BY CRITERIA FOR STUDENTS' USE OF MOBILE PHONES (2020-2023)
Total number of primary and secondary education schools (%)

12%
of schools in the South adopted facial recognition systems to identify students

Students can use their mobile phones only in certain locations or at certain times

	Up to Primary Education	Up to Lower Secondary Education	Up to Upper Secondary Education or Professional Training
2020	61	80	76
2022	56	68	74
2023	52	73	76

■ 2020 ■ 2022 ■ 2023

73%
of schools have profiles or pages on social networks

Students cannot use their mobile phones at school

	Up to Primary Education	Up to Lower Secondary Education	Up to Upper Secondary Education or Professional Training
2020	32	10	7
2022	42	21	7
2023	43	20	8

■ 2020 ■ 2022 ■ 2023

55%
of schools have data protection and information security policies

SCHOOLS BY SYSTEMS, APPLICATIONS, AND PLATFORMS USED (2023)
Total number of primary and secondary education schools (%)

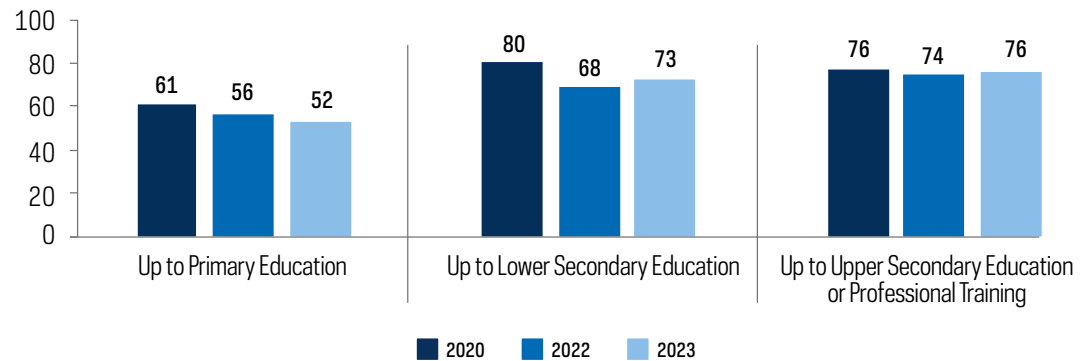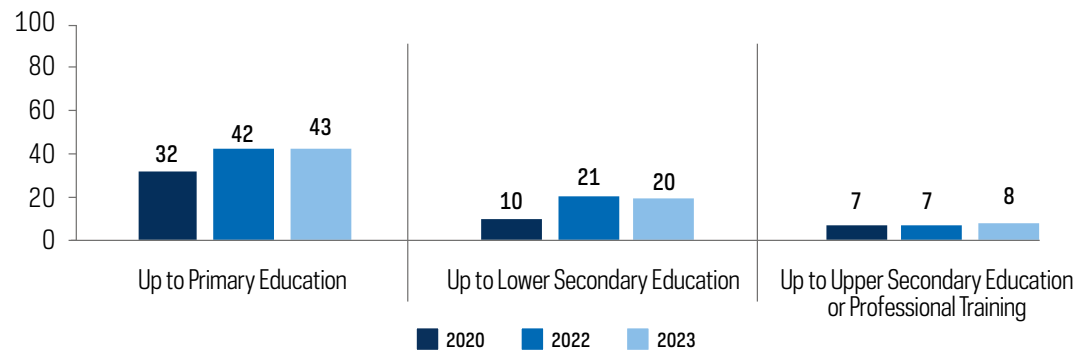|	Municipal	State	Private
Institutional e-mail	79	96	95
Profile or pages on social networks	60	88	93
Sistema de armazenamento de dados e arquivos em núvem	59	84	79
Online class record books or student enrollment, grades, and attendance control systems	77	96	76
Virtual learning platforms or environments	51	81	73
Site	19	34	66
Own mobile phone or tablet applications	24	47	53
Blog	7	16	21

■ Municipal ■ State ■ Private

34%
of schools held discussions or lectures on privacy and personal data protection in the 12 months prior to the survey

ICT in Health

Since 2013, the ICT in Health survey has been conducted to produce indicators on the adoption of ICT in Brazilian healthcare facilities and their usage by healthcare professionals such as physicians and nurses.

In its tenth edition, the survey's historical series allows analyses of the evolution of infrastructure and the adoption of ICT-based applications in healthcare facilities across the country. The ICT in Health 2023 survey also deepened the analysis of the use of Artificial Intelligence (AI), with new indicators on types of tools, applications, and reasons for not adopting AI. In addition, the survey expanded the breakdown of results, providing unprecedented information by federative unit for the topics examined. Through telephone interviews and a web-based questionnaire, the survey interviewed 4,117 managers in healthcare facilities between February and July 2023.

Articles published in ICT in Health 2023

Artificial Intelligence and Public Health: A Dialogue Between Experts and ChatGPT
Marcelo D'Agostino, Myrna C. Marti, Ana Estela Haddad, Sebastian Garcia-Saiso, & Luciana Portilho
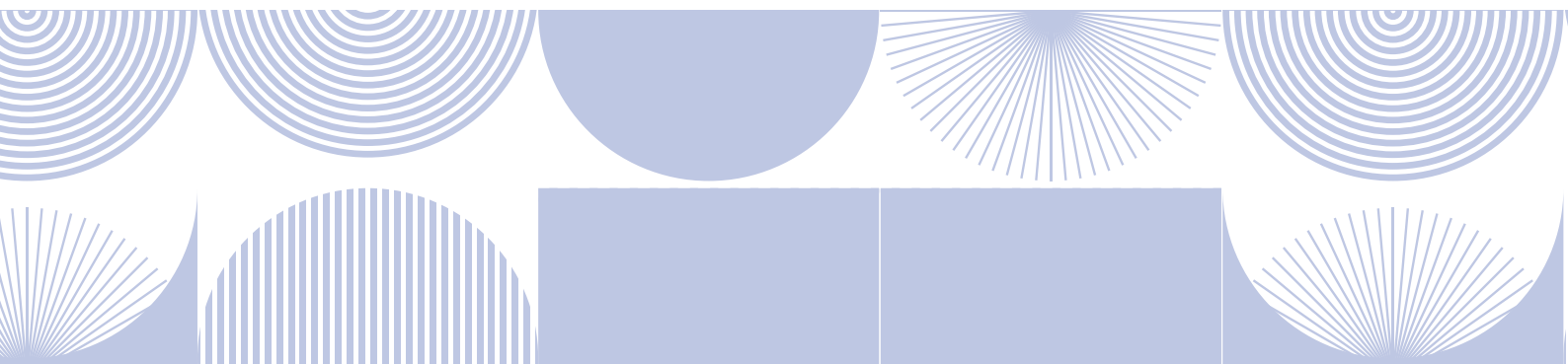
Digital Patient Data Protection
Analluza Bolivar Dallari

Digital Health Skills: Results of the Workshop Held During the CBIS-2022
Juliano de S. Gaspar, Raquel Acciarito Motta, & Heimar de F. Marin

Digital Health Vision: The Experience and Collaborative Method of the National Education and Research Network
Claudia Moro, Mariana de Mello Gusso, Gilberto Vieira Branco, Edson Amaro Jr., Lincoln de Assis Moura Jr., & Paulo Roberto de Lima Lopes

NURSES BY USE OF GENERATIVE AI RESOURCES

Total number of nurses with computer access in healthcare facilities (%)

4%
of healthcare facilities used AI

Total	16
TYPE OF FACILITY	
PHU	9
Oupatient	9
Inpatient (up to 50 beds)	7
Inpatient (more than 50 beds)	23
AGE GROUP	
Up to 30 years old	7
31 to 40 years old	16
41 years old or older	21

(scale: 0 10 20 30 40 50)

PHYSICIANS BY USE OF GENERATIVE AI RESOURCES (2024)

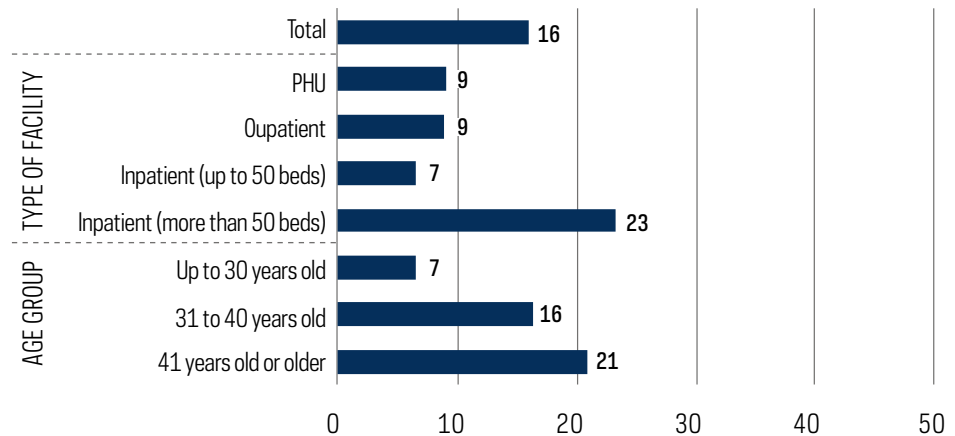*Total number of nurses with computer access in healthcare facilities (%)*

16%
of inpatient facilities with more than 50 beds used AI

7%
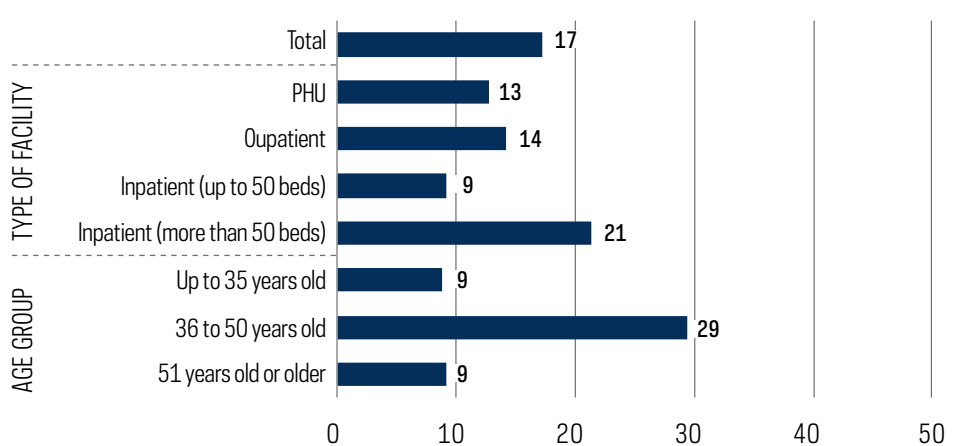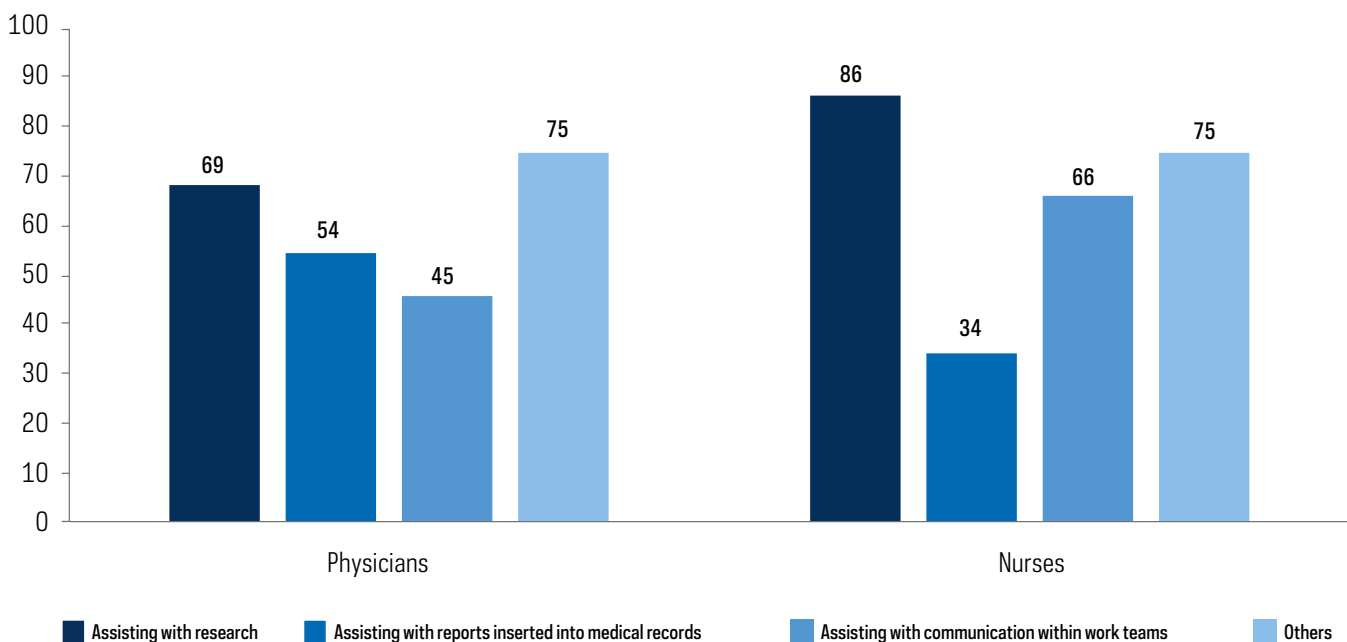of facilities focused on diagnosis and therapy services (SADT) used AI

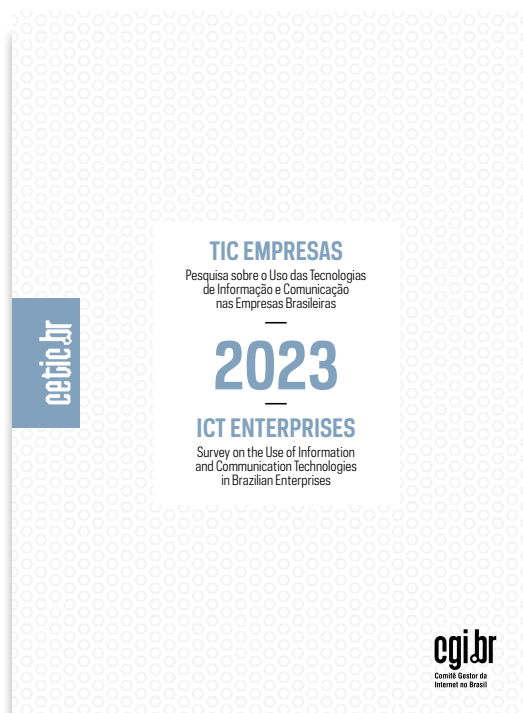|	
Total	17
TYPE OF FACILITY	
PHU	13
Oupatient	14
Inpatient (up to 50 beds)	9
Inpatient (more than 50 beds)	21
AGE GROUP	
Up to 35 years old	9
36 to 50 years old	29
51 years old or older	9

(scale: 0 10 20 30 40 50)

PHYSICIANS AND NURSES BY TYPES OF APPLICATIONS OF GENERATIVE AI RESOURCES (2024)

Total number of physicians and nurses with computer access in healthcare facilities (%)

	Assisting with research	Assisting with reports inserted into medical records	Assisting with communication within work teams	Others
Physicians	69	54	45	75
Nurses	86	34	66	75

- ■ Assisting with research
- ■ Assisting with reports inserted into medical records
- ■ Assisting with communication within work teams
- ■ Others

ICT Enterprises

TIC EMPRESAS
Pesquisa sobre o Uso das Tecnologias
de Informação e Comunicação
nas Empresas Brasileiras
—
2023
—
ICT ENTERPRISES
Survey on the Use of Information
and Communication Technologies
in Brazilian Enterprises

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cgi.br
Comitê Gestor da
Internet no Brasil

Since 2005, the ICT Enterprises survey has been conducted to measure the adoption of ICT in enterprises with 10 or more employed persons. Its objective is to investigate access to infrastructure and the use and appropriation by the private sector of new technologies, mapping their perceptions of associated benefits.

In this edition, the survey provides a comprehensive overview of the use of ICT among Brazilian enterprises, highlighting changes in their performance due to the challenges posed by the COVID-19 pandemic. It also deepened the investigation into the digital economy in Brazil, including aspects of enterprises' connectivity, online presence, and electronic commerce. Data collection for the 2023 edition, conducted by telephone, took place between March and December 2023. A total of 4,457 enterprises were interviewed.

Articles published in ICT Enterprises 2023

New Industry Brazil – An Essential Policy for Digital Transformation
Verena Hitner

**Artificial Intelligence and Digital Technologies in Brazil: Characterization with Multiple Correspondence Analysis**
Mauricio Benedeti Rosa & Luis Claudio Kubota

Survey on the Use of Artificial Intelligence in Manufacturing and ICT Enterprises in the State of São Paulo, Brazil
Carlos Eduardo Torres Freire, Lucas Malta Mingardo, Andre Meyer Passarelli, Rosana Azevedo Miguel, Fábio José Novaes de Senne, & Leonardo Melo Lins

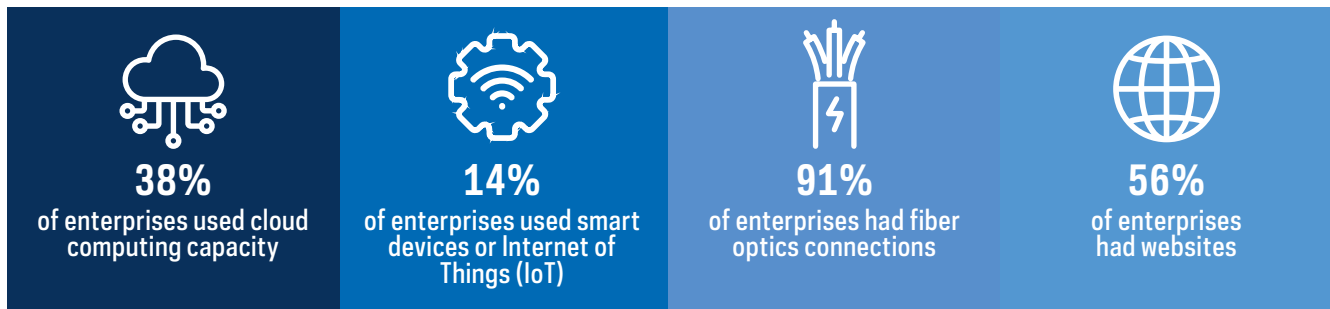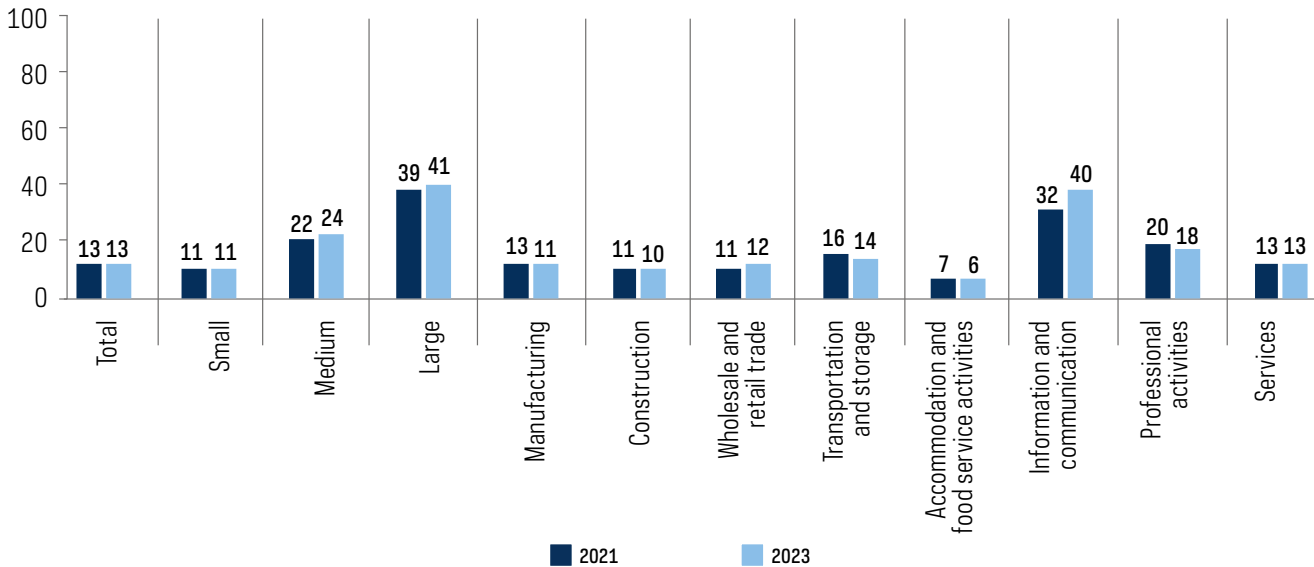**Smart Cities: Urban Dynamics in Times of Technological and Demographic Revolution**
Regiane Relva Romano
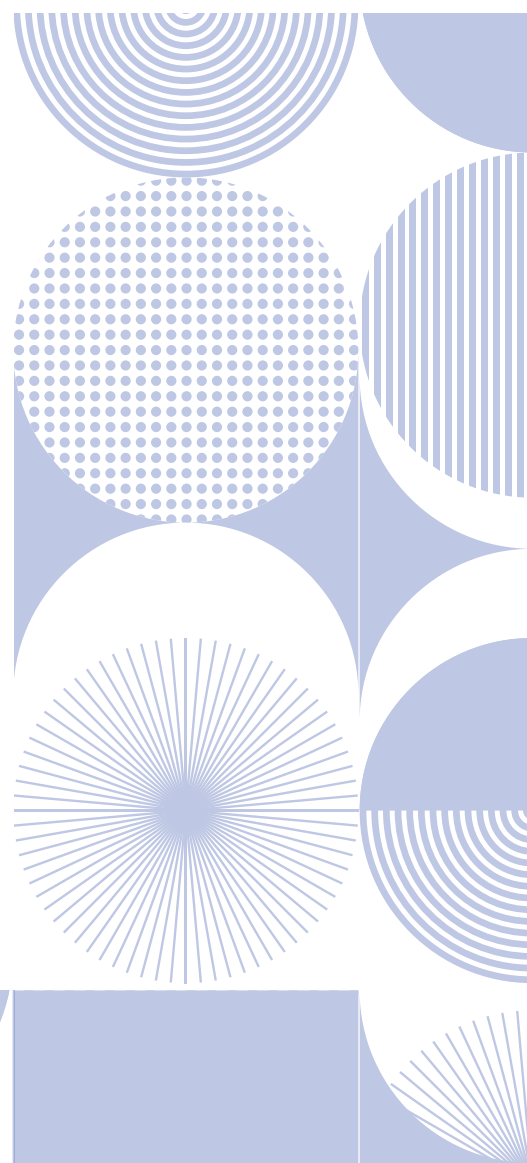
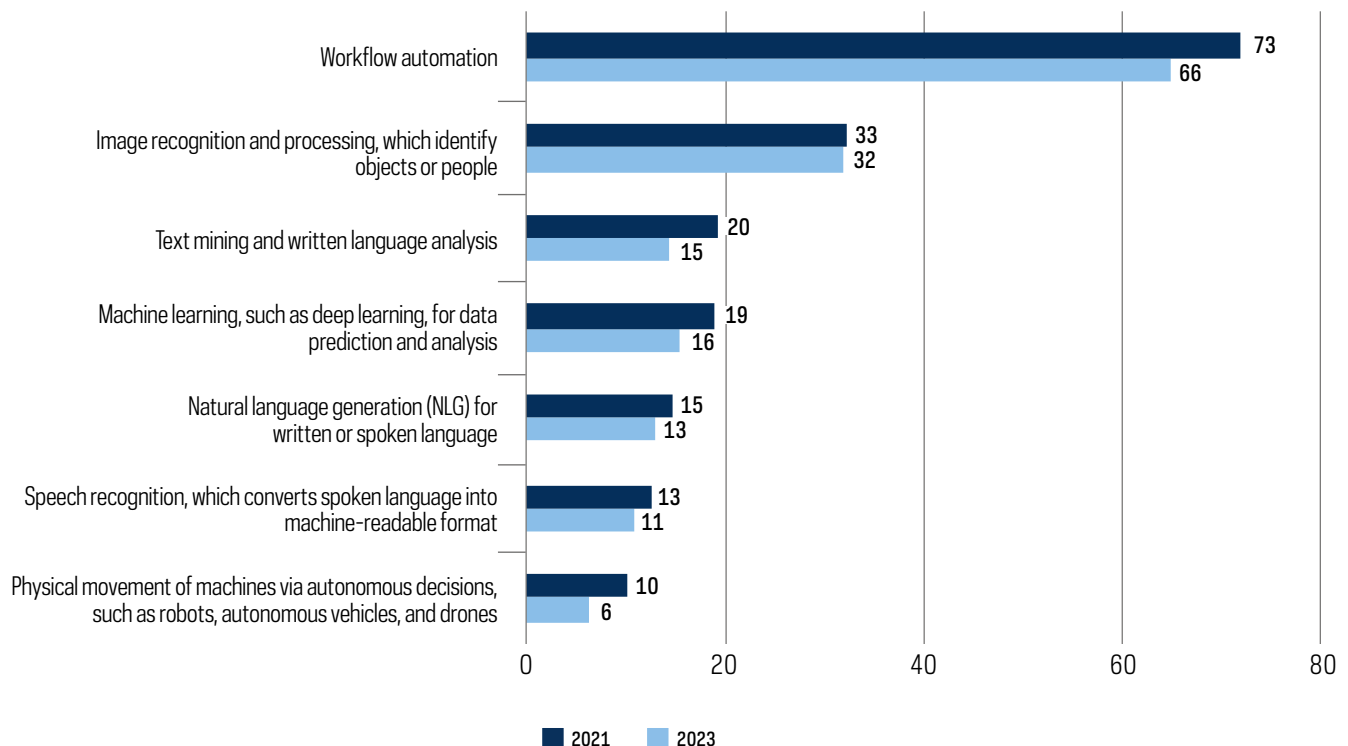In 2023, **13%** of Brazilian enterprises used AI technologies (%)

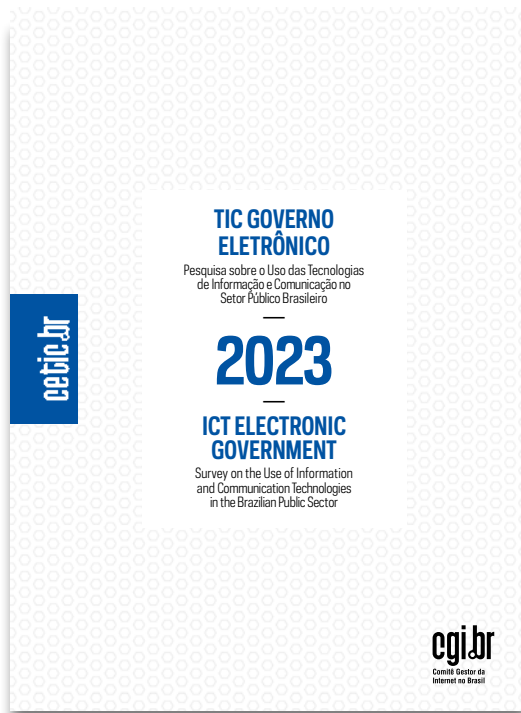## ENTERPRISES THAT USED AI TECHNOLOGIES, BY SIZE AND SECTOR (2021-2023)

Total number of enterprises (%)

	2021	2023
Total	13	13
Small	11	11
Medium	22	24
Large	39	41
Manufacturing	13	11
Construction	11	10
Wholesale and retail trade	11	12
Transportation and storage	16	14
Accommodation and food service activities	7	6
Information and communication	32	40
Professional activities	20	18
Services	13	13

38% of enterprises used cloud computing capacity

14% of enterprises used smart devices or Internet of Things (IoT)

91% of enterprises had fiber optics connections

56% of enterprises had websites

ENTERPRISES THAT USED AI TECHNOLOGIES, BY TYPE (2021-2023)

Total number of enterprises that used IA technologies (%)

	2021	2023
Workflow automation	73	66
Image recognition and processing, which identify objects or people	33	32
Text mining and written language analysis	20	15
Machine learning, such as deep learning, for data prediction and analysis	19	16
Natural language generation (NLG) for written or spoken language	15	13
Speech recognition, which converts spoken language into machine-readable format	13	11
Physical movement of machines via autonomous decisions, such as robots, autonomous vehicles, and drones	10	6

TIC GOVERNO
ELETRÔNICO

Pesquisa sobre o Uso das Tecnologias
de Informação e Comunicação no
Setor Público Brasileiro

cetic.br

2023
—
ICT ELECTRONIC
GOVERNMENT

Survey on the Use of Information
and Communication Technologies
in the Brazilian Public Sector

cgi.br
Comitê Gestor da
Internet no Brasil

ICT Electronic Government

Conducted biennially since 2013, the ICT Electronic Government survey investigates the provision of digital government services in Brazil. To analyze this scenario, interviews are conducted with ICT managers and those responsible for the digital content of governmental organizations at the three levels of government (federal, state, and local), and in all branches (Executive, Legislative, Judicial, and Public Prosecutor's Office).

The sixth edition of the survey pointed out the main advances and challenges related to digitalization in the public sector in the last decade and highlighted initiatives related to the use of these technologies for an inclusive and people-centered digital government and the inclusion of new technologies in the activities of public organizations. For the first time, the survey collected indicators about registration or login requirements for access to online public services. Data collection, carried out by telephone, took place between July 2023 and February 2024. A total of 677 federal and state government organizations and 4,265 local governments were interviewed.

Articles published in ICT Electronic Government 2023

Towards Mastering Artificial Intelligence and Digital Governance in the Public Sector: Principles and Recommendations
Gianluca Misuraca, Pierre Rossel, & Prateek Sibal

**Challenges of Data Governance for the Construction of a Digital Government Policy in Brazil**
Fernando Filgueiras & Lizandro Lui

Turning Data into Intelligence: The Role of Strategic Intelligence Centers in Public Health
Juliane Aparecida Alves, Marcus Vinícius Carvalho, & Sandro Terabe
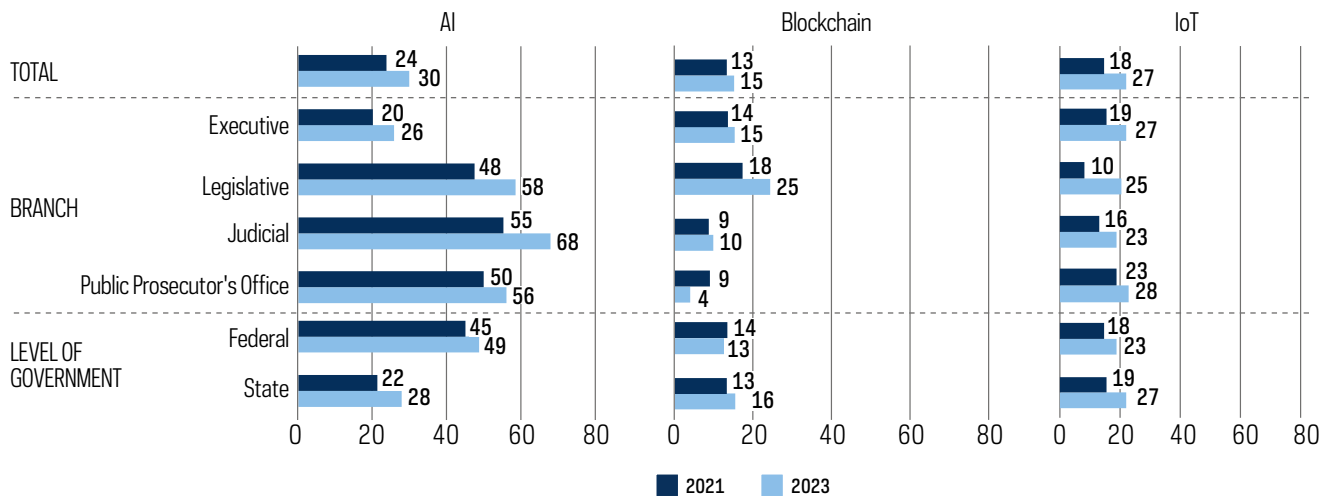
The Emergency Aid Case: Challenges of a Datified Social Protection Policy
Clarice Tavares & Bárbara Simão
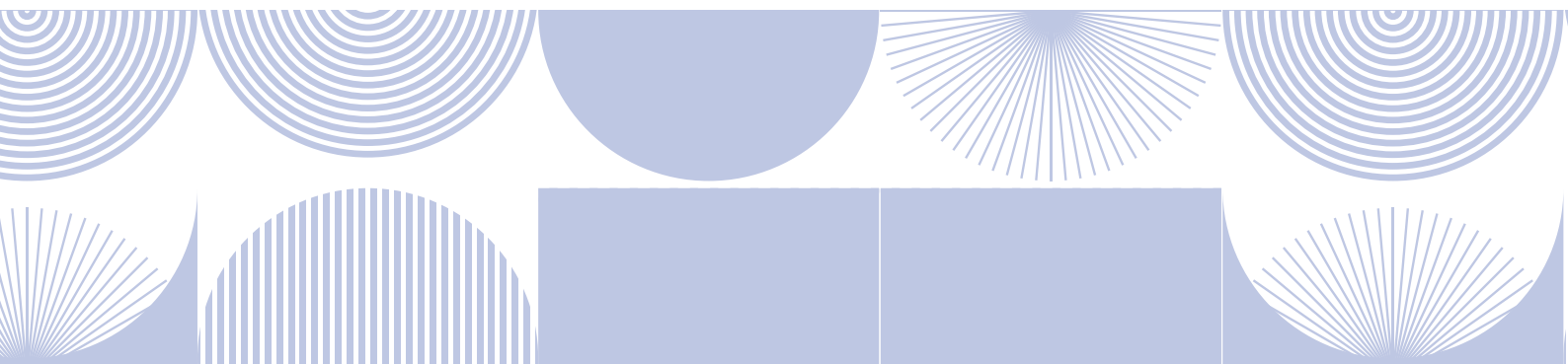
FEDERAL AND STATE GOVERNMENT ORGANIZATIONS THAT USED NEW TECHNOLOGIES IN THE LAST 12 MONTHS, BY TYPE (2021-2023)

Total number of federal and state government organizations (%)

AI

	2021	2023
TOTAL	24	30
Executive	20	26
Legislative	48	58
Judicial	55	68
Public Prosecutor's Office	50	56
Federal	45	49
State	22	28

Blockchain

	2021	2023
TOTAL	13	15
Executive	14	15
Legislative	18	25
Judicial	9	10
Public Prosecutor's Office	9	4
Federal	14	13
State	13	16

IoT

	2021	2023
TOTAL	18	27
Executive	19	27
Legislative	10	25
Judicial	16	23
Public Prosecutor's Office	23	28
Federal	18	23
State	19	27

BRANCH: Executive, Legislative, Judicial, Public Prosecutor's Office
LEVEL OF GOVERNMENT: Federal, State

■ 2021　■ 2023

100% of local governments with more than 500,000 inhabitants said they had websites	**94%** of local governments with more than 500,000 inhabitants offered five or more digital services via their websites	**92%** of local governments with up to 10,000 inhabitants said they had websites	**56%** of local governments with up to 10,000 inhabitants offered five or more digital services via their websites

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LOCAL GOVERNMENTS WITH CENTERS OF OPERATION FOR MONITORING TRAFFIC, SECURITY, OR EMERGENCY SITUATIONS, BY SIZE (2019-2023)

Total number of local governments (%)

	2019	2021	2023
More than 500,000 inhabitants	86	81	84
More than 100,000 up to 500,000 inhabitants	66	74	78
More than 10,000 up to 100,000 inhabitants	25	28	37
Up to 10,000 inhabitants	10	16	22

○ More than 500,000 inhabitants　○ More than 100,000 up to 500,000 inhabitants
○ More than 10,000 up to 100,000 inhabitants　○ Up to 10,000 inhabitants
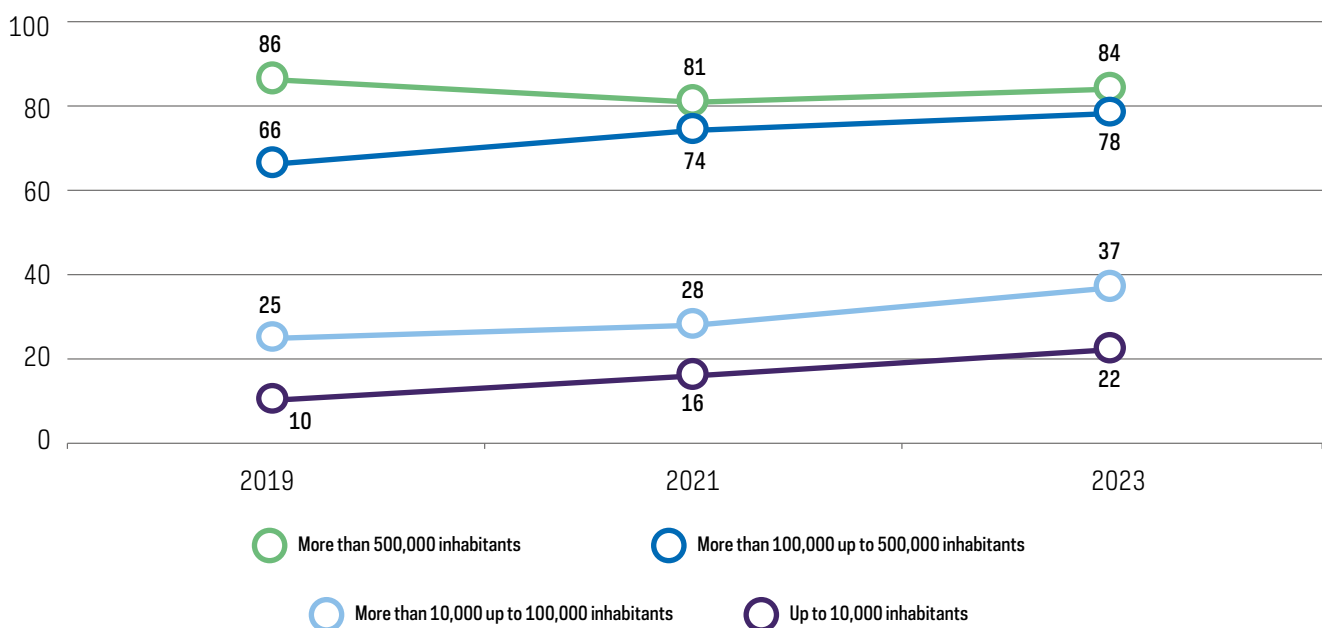
Among the reasons for not adopting AI technologies, the lack of qualified personnel was the most cited by federal and state government organizations **(32%)**

ICT Panel: Web Survey with Brazilian Internet Users: Perspectives on the Disposal of Electronic Waste

The ICT Panel is a survey conducted with Internet users through self-administered web-based questionnaires. It investigates activities carried out on the Internet and the devices used to access it, using the indicators from the ICT Households survey as a reference.

The study has been conducted by Cetic.br|NIC.br with the objective of addressing topics not yet covered by its existing surveys. In this edition, the Web survey with Brazilian Internet users: Perspectives on the disposal of electronic waste, investigated electronic waste disposal, which covers the understanding of the concept, ownership of electronic devices, and habits related to disposal.

The survey results revealed a limited awareness of the risks and potential hazards associated with e-waste, as a significant portion of the population perceives the concept as either abstract or shaped by a distorted understanding of the digital environment. It also highlighted high proportions of disposing of equipment along with regular waste or disposing of equipment that is still in working condition.
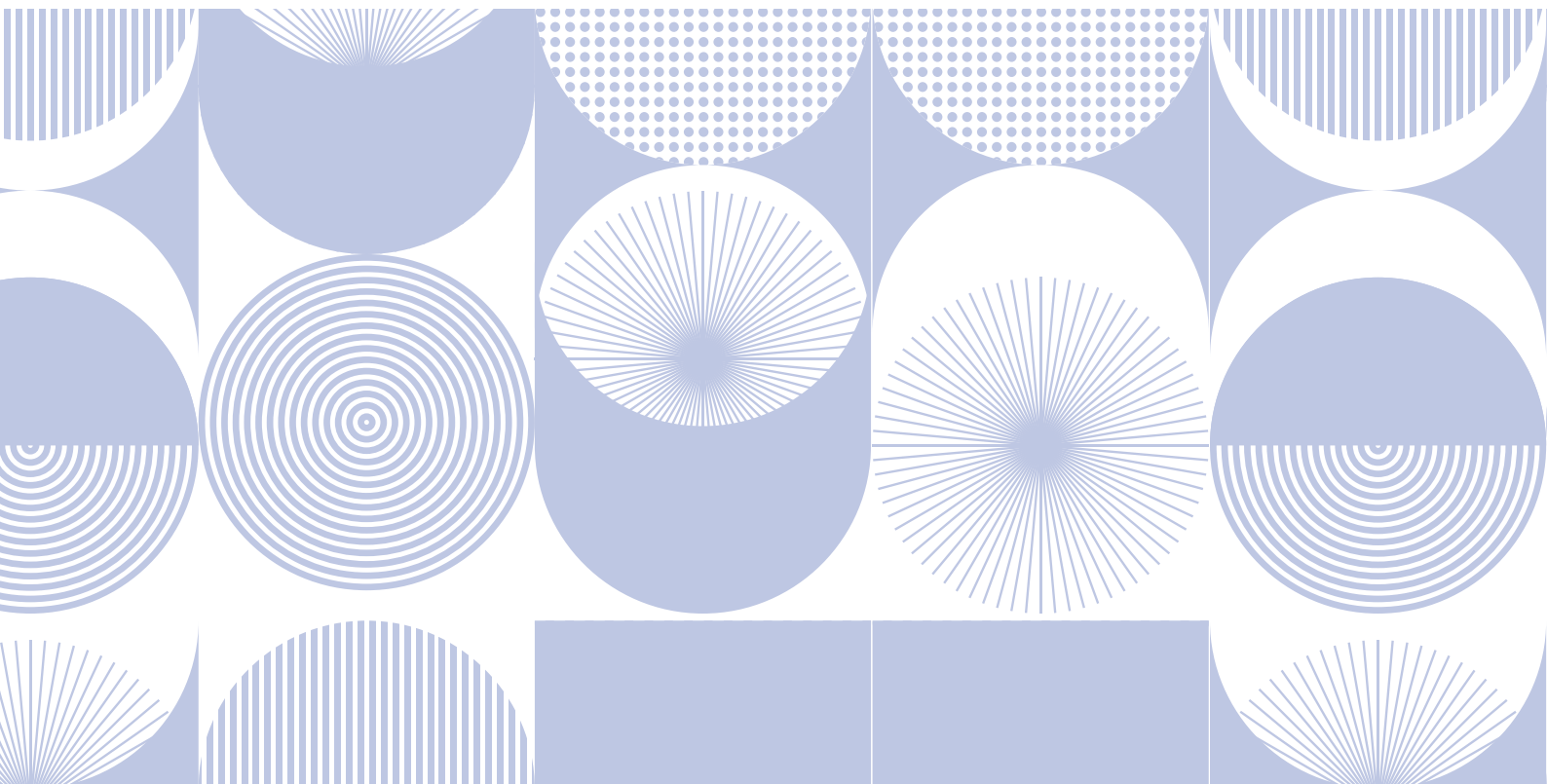
INTERNET USERS BY REASONS FOR EXCHANGING MOBILE PHONE (2022)

Total number of Internet users 16 years old or older (%)

Reason	%
Because the previous one broke	51
Because I wanted a new phone	14
Because of the previous one's battery	10
Because the previous one did not run an app that I wanted or needed	7
Because the previous one was lost or stolen	6
Because the previous one went to someone else in the family	3
Other reason	2
Does not apply	5
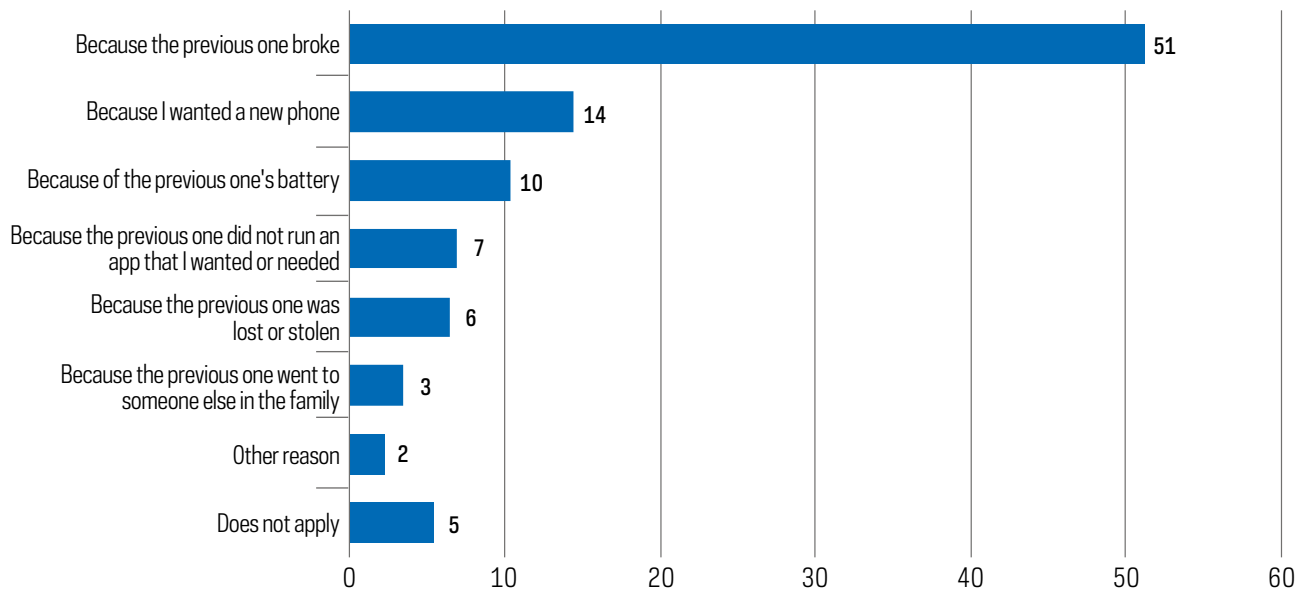
INTERNET USERS BY DISPOSAL OF ELECTRONIC EQUIPMENT IN THE LAST 12 MONTHS (2022)

Total number of Internet users 16 years old or older (%)

Equipment	%
Mobile phones	25
Computer peripherals and accessories	17
Televisions	12
Tablets	8
Videocassette, CD, DVD, or Blu-ray players	7
Printers or scanners	6
Desktop computers	5
Laptops	5
Game consoles	5
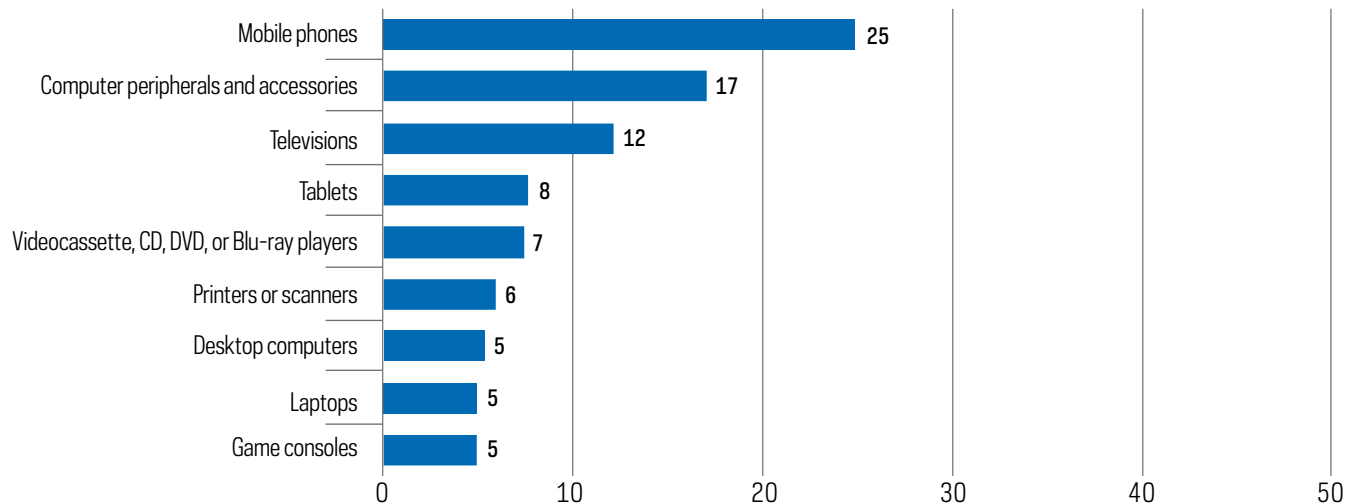
43% of Internet users have disposed of an electronic device in the last 12 months

32% of Internet users had second-hand mobile phones

29% of Internet users related the concept of "e-waste" to electronic equipment that needs to be disposed of

1 in 4 Internet users had electronic devices that were not working or in use

Privacy and Personal Data Protection

With the growing adoption of digital technologies by public and private organizations and by individuals, it is essential to understand how privacy and personal data protection are perceived in Brazil and identify the strategies they adopt to ensure it. In this context, Cetic.br|NIC.br initiated in 2021 the project Privacy and personal data protection: perspectives of individuals, enterprises, and public organizations in Brazil. The analysis is divided into three dimensions: individuals (ICT Panel survey); enterprises (based on data from the ICT Enterprises survey); and public organizations (based on data from the ICT Electronic Government, ICT in Health, and ICT in Education surveys).

The second edition of the survey investigated how the topic has been perceived and incorporated into the day-to-day lives of individuals. At the same time, the survey pointed to trends concerning the adoption of practices to become adequate for data protection among public and private organizations, indicating points for future actions in the field.

The panel with individuals (ICT Panel survey) interviewed, via an online questionnaire, 2,618 Internet users 16 years old or older in December 2023. The ICT Enterprises 2023 survey included a specific module on the processing of personal data in the private sector. Interviews were conducted with 2,075 enterprises between August and December 2023. In addition to the results for individuals and enterprises, an analysis of Brazilian public organizations was carried out based on indicators related to the theme in the ICT Electronic Government 2023, ICT in Health 2023, and ICT in Education 2022 and 2023 surveys.

INTERNET USERS BY PERSONAL DATA ACCESS MANAGEMENT PRACTICES (2021-2023)

Total number of Internet users 16 years old or older (%)

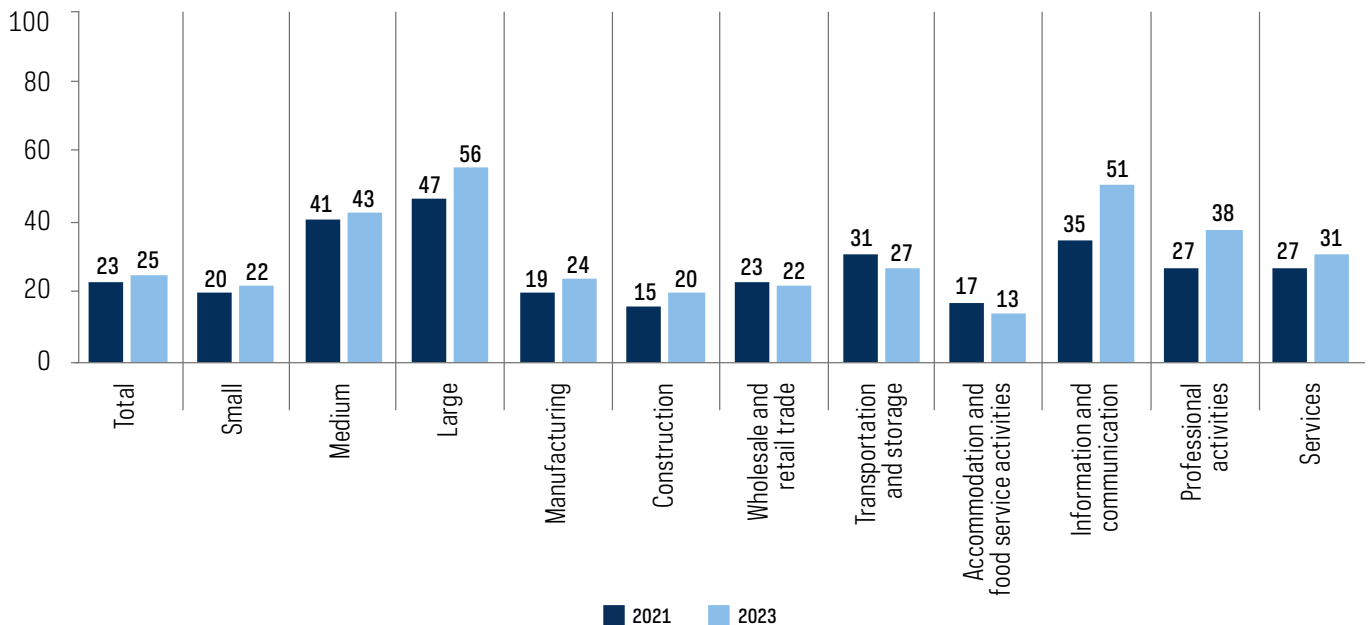| Practice	2021	2023
Read privacy policies of web pages or apps	68	67
Checked the security of web pages or apps, for instance, by verifying whether a web page had a security padlock	70	67
Denied permission to the use of personal data for targeted advertising	69	66
Defined or limited the use of cookies on a website visited	58	60
Restricted access to geographic location, for example, by GPS	62	60
Limited access to social network profiles	64	59
Requested that web pages, apps, or search engines delete information about them	42	45

INTERNET USERS BY LEVEL OF CONCERN ABOUT PROVISION OF SENSITIVE PERSONAL INFORMATION (2023)

Total number of Internet users 16 years old or older (%)

Category	Very concerned	Concerned	Not very concerned	Not at all concerned	Does not know
Biometric data, such as fingerprints or face photos	32	28	22	14	4
Health data, such as diseases, medical records, and test results	24	27	27	17	5
Genetic data	18	22	24	27	9
Political opinions or trade union membership	17	19	23	33	8
Gender, such as male, female or non-binary	15	18	25	38	5
Sexual orientation	14	17	23	40	6
Color or race	14	18	23	41	5
Religious beliefs	13	17	23	41	6

Legend: ■ Very concerned ■ Concerned ■ Not very concerned ■ Not at all concerned ■ Does not know

ENTERPRISES BY PRESENCE OF SPECIFIC AREAS OR EMPLOYEES RESPONSIBLE FOR PERSONAL DATA PROTECTION, SIZE AND SECTOR (2021-2023)

Total number of enterprises (%)

Category	2021	2023
Total	23	25
Small	20	22
Medium	41	43
Large	47	56
Manufacturing	19	24
Construction	15	20
Wholesale and retail trade	23	22
Transportation and storage	31	27
Accommodation and food service activities	17	13
Information and communication	35	51
Professional activities	27	38
Services	27	31

Legend: ■ 2021 ■ 2023

24% of enterprises stored biometric data

33% of enterprises carried out training or capacity-building regarding personal data protection

35% of enterprises made changes to ongoing contracts to comply with the Brazilian General Data Protection Law (LGPD)

32% of enterprises created compliance plans for personal data protection

Internet Sectoral Overview

The Internet Sectoral Overview (ISO) is a quarterly publication produced by Cetic.br|NIC.br that addresses various themes related to access to and use of digital technologies across different sectors of society. It is available in Portuguese and English, and the articles, interviews, and infographics featured in the ISO explore current debates on digital inclusion and also draw on data and findings that derive from the research conducted by Cetic.br|NIC.br. Four editions were published in 2024 addressing "Technologies for Development."
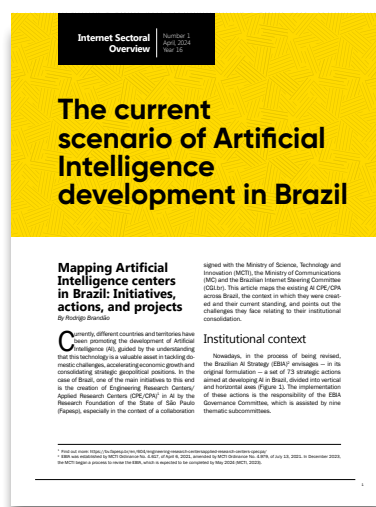
Year 16 – No. 1: The Current Scenario of Artificial Intelligence Development in Brazil

- **Article I** - "Mapping Artificial Intelligence Centers in Brazil: Initiatives, Actions, and Projects," by Rodrigo Brandão (Cetic.br|NIC.br)
- **Interview I** - "The Academic Production on Artificial Intelligence in Brazil," with Fabio Gagliardi Cozman (USP)
- **Interview II** - "Brazilian Artificial Intelligence Observatory," with Luis Alexandre Reali Costa (OBIA)
- **Article II** - "Recommendations for the Advancement of Artificial Intelligence in Brazil," by Brazilian Academy of Sciences
- **Domain Report** - "Domain Registration Dynamics in Brazil and Around the World"
- **Answer to Your Questions** - "The Use of Artificial Intelligence in Brazil"

Year 16 – No. 2: Technologies for Public Services

- **Article I** – "Inclusive Digital Government: Gender Differences in Access to Online Public Services," by Javiera F. Medina Macaya, Manuella Maia Ribeiro, and Camila dos Reis Lima (Cetic.br|NIC.br)
- **Interview I** – "Citizen-Centered Digital Government," with Luanna Roncaratti (MGISP)
- **Article II** – "Exploring Urban Innovation: Insights from Artificial Intelligence Adoption in Brazilian Cities", by Soumaya Ben Dhaou, Tupokigwe Isagah, and Larissa Magalhães (UNU-EGOV)
- **Interview II** – "Privacy, Public Services, and Marginalized Groups," with Anita L. Allen (University of Pennsylvania)
- **Domain Report** – "Domain Registration Dynamics in Brazil and Around the World"
- **Internet Markers in Brazil** – "Indicators of the Internet Traffic Measurement System (SIMET)"
- **Answers to Your Questions** – "Public Services on the Internet"
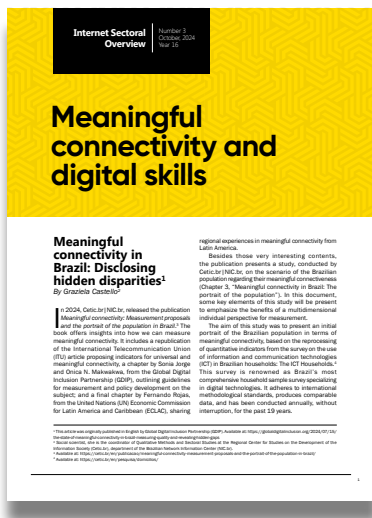
Year 16 - No. 3: Meaningful Connectivity and Digital Skills

- **Article I** - "Meaningful Connectivity in Brazil: Disclosing Hidden Disparities," by Graziela Castello (Cetic.br|NIC.br)
- **Article II** - "The Outcomes of Gaining Digital Skills for Young People's Lives and Wellbeing: A Systematic Evidence Review," by Sonia Livingstone, Giovanna Mascheroni, and Mariya Stoilova (LSE and Unicatt)
- **Interview I** - "Technologies in Education: Connectivity in Schools and the Development of Digital Skills in Brazil," with Ana Dal Fabbro (CGTI/SEB)
- **Domain Report** - "Domain Registration Dynamics in Brazil and Around the World"
- **Internet Markers in Brazil** – "IX.br: Data on Internet Exchange Points"
- **Answer to Your Questions** - "Digital Skills Among Children and Youths"

Year 16 - No. 4: Artificial Intelligence and the Labor Market

- **Article I** – "Is This Time Different?," by Thiago Meireles (Cetic.br|NIC.br)
- **Interview I** – "The Impacts of Artificial Intelligence on the Labor Market," with Professor Morgan R. Frank (University of Pittsburgh)
- **Article II** – "Buffer or Bottleneck? Employment Exposure to Generative Artificial Intelligence and the Digital Divide in Latin America," by Paweł Gmyrek, Hernan Winkler, and Santiago Garganta (ILO, World Bank, and UNLP)
- **Interview II** – "Artificial Intelligence and the Labor Market in Brazil: Opportunities, Challenges, and Public Policy," with Paula Montagner (MTE)
- **Domain Report** – "Domain Registration Dynamics in Brazil and Around the World"
- **Answers to Your Questions** – "Would You Like to Learn More About the Use of Artificial Intelligence in Brazilian Enterprises?"

NIC.br Sectoral Studies

The NIC.br Sectoral Studies publication series, launched in 2016, addresses a variety of emerging themes that explore the interface between ICT and society. In 2024, two editions were published. The first edition explores new dimensions and the challenges involved in measuring meaningful connectivity in Brazil (available in Portuguese, English, and Spanish), and the second addressed the use of AI in the health sector (available in Portuguese and English).

Meaningful connectivity: Measurement proposals and the portrait of the population in Brazil

The publication was launched in April 2024 during the Seminar "Beyond Internet Access: How to Ensure Meaningful Connectivity," which was held in Brasilia by the Universalization and Digital Inclusion Chamber of the Brazilian Internet Steering Committee (CGI.br).

The study presents a detailed analysis of the gaps that exist in access to, and use and appropriation of, the Internet in Brazil. It provides new perspectives on measuring connectivity, based on the concept of meaningful connectivity. The publication includes international debates and perspectives from Latin America. In addition, Chapter 3 provides an analysis of the Brazilian scenario, revealing that although we are moving toward universal access, there is still a long way to go to achieve truly meaningful connectivity.

Presentation
Demi Getschko (NIC.br)

Prologue
A Call to Promote Meaningful Connectivity in Brazil
Renata Vicentini Mielli (CGI.br)

Chapter 1: Closing the Digital Possibilities Divide: A Call for Universal, Meaningful, and Affordable Broadband
Sonia Jorge and Onica N. Makwakwa (GDIP)

Chapter 2: Achieving Universal and Meaningful Digital Connectivity: Setting a Baseline and Targets for 2030
International Telecommunication Union (ITU)

Chapter 3: Meaningful Connectivity in Brazil: The Portrait of the Population
Graziela Castello (Cetic.br|NIC.br)

Final Considerations: Regional Experiences in Meaningful Connectivity
Fernando Rojas (ECLAC)

Artificial Intelligence in Healthcare: Potential, Risks, and Perspectives for Brazil

The publication was launched in September 2024 during the 1st Seminar of the Brazilian Artificial Intelligence Observatory, which was organized by the NIC.br in São Paulo. Its main objective was to map the current stage of AI development and adoption in Brazil's healthcare sector, aiming to answer two key questions: Where do we stand, and how are we progressing?

The study followed a qualitative approach, with specific goals to gather relevant information on: the opportunities that AI presents for the healthcare sector in Brazil; the challenges to harnessing these opportunities; the potential risks that need to be managed; ongoing research agendas, public policies, and national initiatives; and the perceived impacts of AI tools on clinical practice.

The publication was structured in two parts. The first presented expert-authored articles offering an overview of the literature and regulatory considerations related to AI in health care. The second featured a qualitative survey based on in-depth interviews with a diverse set of stakeholders involved in the development and implementation of AI in Brazil's healthcare system.

Presentation
Demi Getschko (NIC.br)

Prologue
Artificial Intelligence and Health
Heimar de Fátima Marin (IMIA)

PART 1 - ARTICLES
Artificial Intelligence in Healthcare: An Overview of the Literature and Guidelines for Brazil
Rodrigo Brandão (Cetic.br|NIC.br)

Regulatory Considerations on Artificial Intelligence for Health
World Health Organization (WHO) and International Telecommunication Union (ITU)

Transparency and Explainability: Prospects for the Regulation of Artificial Intelligence in Healthcare in Brazil
Daniel A. Dourado and Fernando Aith (USP)

PART 2 - QUALITATIVE RESEARCH
Methodological Notes
Graziela Castello, Monise Picanço, Priscila Vieira, and Rodrigo Brandão (Cetic.br|NIC.br and CEBRAP)

Artificial Intelligence in Healthcare: A Qualitative Diagnosis of the Brazilian Scenario
Graziela Castello, Monise Picanço, Priscila Vieira, and Rodrigo Brandão (Cetic.br|NIC.br and CEBRAP)

Conclusions
Public Policy Drivers for Using Artificial Intelligence in Healthcare
Glauco Arbix and João Paulo Cândia Veiga (USP and C4AI)

Other ICT Survey Projects

ICT in Culture

Conducted since 2016, the ICT in Culture survey investigates the presence of ICT infrastructure and the use of these technologies in Brazilian cultural facilities, focusing on internal management, public relations, and collection digitization. It also presents information about IT management in these institutions and the perceptions of the contributions and challenges of computer and Internet use in cultural facilities, including archives, heritage sites, libraries, cinemas, museums, culture points, and theaters.

ICT Nonprofit Organizations

Conducted since 2012, the ICT Nonprofit Organizations survey investigates the administrative and financial capacities of nonprofit organizations, their access to and use of ICT, the infrastructure, capabilities, and skills related to these techologies, barriers these organizations face to ICT access and use, and data protection and privacy initiatives adopted by them.

ICT Providers

The ICT Providers survey, carried out since 2011, aims to map the Brazilian Internet access provision sector. To this end, the survey established the characteristics of Internet service providers in terms of the services they offer, market operations, and technologies adopted.
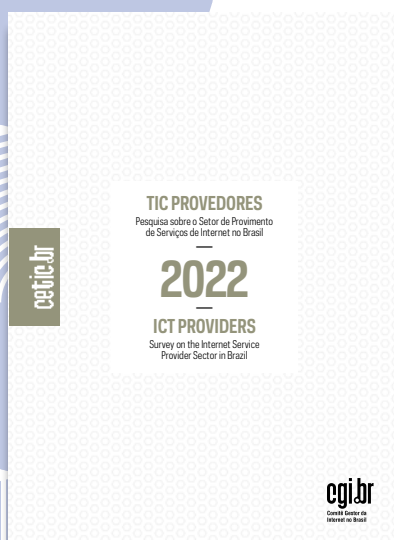
Public Debates: Advancing Information and Knowledge Societies

The Regional Center for Studies on the Development of the Information Society of the Brazilian Network Information Center (Cetic.br|NIC.br) promotes public debates and technical meetings with key stakeholders from the government, academia, the private sector, and international and civil society organizations to discuss the socioeconomic and cultural implications of digital technologies and the development of knowledge and information societies. Based on an interdisciplinary and multistakeholder approach, it aims to discuss the multifaceted aspects related to access to, and use and appropriation of, technologies by different segments of society.

During 2024, the Center held public events that marked the launch of new publications and also served as a forum for discussing relevant themes, encouraging informed public debate on digital technologies and society. Among several public debates organized or supported by the Center throughout the year, several focused on relevant findings from the national information and communication technologies (ICT) surveys conducted by Cetic.br|NIC.br. Below are some of the main events that took place in 2024.

Launch of the Meaningful Connectivity Sectoral Study
April 2024 - Brasília (Brazil)

© NIC.br

On April 16 and 17, 2024, the Universalization and Digital Inclusion Chamber of the Brazilian Internet Steering Committee (CGI.br) held the seminar Beyond Internet Access: How to Ensure Meaningful Connectivity in Brasília. The aim of the event was to contribute to the definition of digital inclusion policies based on meaningful connectivity parameters, through a multi-sectoral and participatory debate.

The event, which brought together representatives from governments, the private sector, civil society, and the scientific and technological community, was marked by the launch of the publication *Meaningful Connectivity: Measurement Proposals and the Portrait of the Population in Brazil*, which is part of the Cetic.br|NIC.br collection of Sectoral Studies.

The study offered a detailed analysis of the existing gaps in Internet access, use, and appropriation in Brazil. Based on this diagnosis and new ways of measuring connectivity, the seminar discussed concrete actions to change this scenario.

Speakers: Graziela Castello (Cetic.br|NIC.br), Sonia Jorge (GDPI), Fernando Rojas (ECLAC).
Moderator: Bia Barbosa (CGI.br).

Launch of the 2023 ICT Surveys
August 2024 - São Paulo (Brazil)

On August 26, 2024, with representatives from United Nations (UN) agencies and other international organizations, Cetic.br|NIC.br promoted the panel Looking Ahead to the Future of Digital Transformation.

The event was marked by the celebration of the 20th anniversary of the Partnership on Measuring ICT for Development, which has been instrumental in defining global standards and methods for collecting ICT indicators. The event also marked the launch of the 2023 ICT Households, ICT Enterprises, and ICT Electronic Government publications.

The speakers discussed challenges such as assessing digital skills and the need for reliable statistics to guide policymakers. They also highlighted Brazil's leadership in Internet governance and the role of ICT indicators in monitoring smart cities and digital services. The panel also emphasized the need to address regional inequalities in Latin America and the Caribbean to foster the digital transformation.

Speakers: Demi Getschko (NIC.br), **Alexandre Barbosa** (Cetic.br|NIC.br), **Deniz Susar** (UNDESA), **Esperanza Magpantay** (ITU), **Scarlett Fondeur Gil** (UNCTAD), and **Sebastián Rovira** (ECLAC).
Moderator: Renata Mielli (CGI.br).

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Launch of the ICT in Health 2024 Survey

October 2024 - Minas Gerais (Brazil)

The ICT in Health 2024 survey data was launched on October 11, 2024, during the XX Brazilian Congress on Health Informatics (CBIS24). The new data showed that Brazilian healthcare facilities are advancing in digitalization, but IT skills in the sector remain low among professionals.

The congress also featured the panel Artificial Intelligence in Health: Potentialities, Risks and Prospects for Brazil, which included the presentation of a study carried out by Cetic.br|NIC.br on the theme.

Speakers: Beatriz Leão (Hospital Sírio-Libanês), **Giliate Coelho Neto** (EBSERH), **and** Luciana Portilho (Cetic.br|NIC.br).

Moderator: Heimar Marin (Federal University of São Paulo).

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Capacity-Building and Awareness-Raising

Cetic.br|NIC.br's capacity-building programs aim to bring together the main stakeholders involved in the production, analysis, and use of ICT indicators in public policies, academia, and sectoral market analysis. These programs are designed for data producers and users, including national statistical institutes, ministries, regulatory agencies, international organizations, and academic institutions.

In addition to disseminating technical knowledge on research methodology, they are a forum for promoting debates on the importance of ICT statistics for evidence-based policymaking and for discussing new measurement options, highlighting the potential of ICT for development. In 2024, in parallel with regular capacity-building and awareness-raising activities on the importance of ICT statistics, the Center continued its support for the Massive Open Online Courses (MOOC) on ICT and Sustainable Development and AI in the Judiciary.

14th NIC.br Annual Workshop on Survey Methodology

The 14th edition of the workshop focused on the new landscape of data production, its ecosystem, and governance. It took place at the NIC.br head office from August 26 to August 29 and had 110 participants who attended in person or remotely.

The audience profile was made up of public managers, researchers, and representatives of civil society and international organizations. The meeting, promoted by the Cetic.br in partnership with the National School of Statistical Sciences (ENCE/IBGE), featured short courses on new methodological approaches for multi-source data production, presentations of practical cases and projects using new approaches, and innovative methods and tools. The workshop also provided insights into methodological challenges and opportunities for data production.

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DAY 1

Keynote: Data Governance in the Context of the Digital Economy, Digital Connectivity, and the Global Digital Compact
Speaker: Ronald Jansen, UNSD (USA).

Panel I: Partnership on Measuring ICT for Development
Speakers: Deniz Susar, UNDESA (USA) / Esperanza Magpantay, ITU (Switzerland) / Scarlett Fondeur Gil, UNCTAD (Switzerland) / Sebastián Rovira, ECLAC (Chile).

Panel II: Country Experiences: Adopting Partnership ICT Indicators
Speakers: Andrea de Panizza, Istat (Italy) / Manuella Maia Ribeiro, Cetic.br|NIC.br (Brazil) / Mark Uhrbach, STATCAN (Canada).

Keynote: Recent Developments in Child-Centric Surveys: Lessons from the UNICEF MICS Program
Speaker: João Pedro Azevedo, UNICEF (USA).

Session I: New Approaches on Measurement: Education and Digital Government
Speaker: Juliette Norrmén-Smith, UNESCO (France) / Pierre Chapelet, UNESCO (France) / Prateek Sibal, UNESCO (France).

Session II: Building Capacity for the Use of Big Data in Latin America and the Caribbean
Speaker: Andrea Diniz da Silva, ENCE/IBGE (Brazil).

Session III: Mobile Phone Data for Information Societies
Speaker: Esperanza Magpantay, ITU (Switzerland).

DAY 2

Short Course I: Fundamentals of Composite Index Development
Speaker: Matija Kovacic, EU (Italy).

Case Study I: Fundamentals of Composite Index Development
Speaker: César Augusto Marques da Silva, ENCE/IBGE (Brazil).

DAY 3

Short Course II: Respondent-Centred Surveys
Speakers: Emma Dickinson, Independent Researcher / currently employed at the ONS (UK) / Laura Wilson, Independent Researcher / currently employed at the ONS (UK) .

Case Study II: Respondent-Centred Surveys
Speaker: André Portela, FGV (Brazil).

DAY 4

Short Course III: Modern Statistical Methods to Adjust for Survey Nonresponse
Speaker: Raphael Nishimura, UMICH (USA).

Case Study III: Non-response
Speaker: Debora Ferreira de Souza, IBGE (Brazil).

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School of Digital Transformation and Innovation in Latin America 2024

The 2024 edition of the School of Digital Transformation and Innovation in Latin America was co-organized by the United Nations Economic Commission for Latin America and the Caribbean (ECLAC), the Development Bank of Latin America (CAF), the Cetic.br|NIC.br, and the Internet Technical Community (LACNIC, ICANN, Internet Society, LACTLD, LAC-IX, LACNOG, Red CLARA), with collaboration from the UNESCO Montevideo Regional Office, the NGO Derechos Digitales, and the German Corporation for International Cooperation (Deutsche Gesellschaft für Internationale Zusammenarbeit [GIZ]). The event took place from September 30 to October 3, 2024, in São Paulo, Brazil.

The 10th edition of the event was structured around five thematic axes, addressing key aspects of the digital landscape. These included "From Access to Meaningful Connectivity," which explored strategies to ensure equitable and effective Internet access; "The Internet: Functioning, Stakeholders, and Current Challenges," focusing on the roles and responsibilities of different actors in the digital ecosystem; "Digital Inclusion and Digital Skills Within the Framework of a Democratic Internet," highlighting the importance of fostering inclusive participation and digital literacy; "Cybersecurity and Privacy," which examined the critical need for secure and resilient digital environments; and "Digital Transformation and Development," emphasizing the role of technology in driving economic and social progress.

The event brought together prominent experts, individuals responsible for digital policies, and researchers interested in the role of innovation and digitization in the development of the region, providing a multi-sector and multistakeholder space for dialogue and learning. The 2024 edition of the School brought together more than 65 participants from 16 countries.

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School of Digital Transformation and Innovation in the Caribbean 2024

The 1st School of Digital Transformation and Innovation in the Caribbean was held in Port of Spain, and Trinidad and Tobago from August 12-15, 2024. The event was co-organized by the Caribbean Telecommunications Union (CTU), the University of the West Indies (UW), the ECLAC, the CAF, the Cetic.br|NIC.br, and the Internet Technical Community (LACNIC, ICANN, Internet Society, LACTLD, LAC-IX, LACNOG, Red CLARA).

This edition was organized around three thematic pillars: "Internet: Operations, Actors, and Current Challenges," "Transitioning to a Digital Society for All: Governance and Regulatory Implications," and "Digitalization of the Economy to Improve Industries' Productivity and Competitiveness." The School featured 14 speakers and 30 in-person senior government officials as participants from 10 CTU Member States. The following CTU Member States were represented among the regional participants: Anguilla, Antigua and Barbuda, Barbados, the British Virgin Islands, Jamaica, St. Maarten, St. Kitts and Nevis, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago.

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MOOC // Tech for Good: The Role of ICT in Achieving the SDGs

This program, offered in a Massive Open Online Course (MOOC) format through the edX Platform, is a joint initiative by Cetic.br|NIC.br, United Nations Educational, Scientific and Cultural Organization (UNESCO), and the SDG Academy. Set up as a self-paced course, it provides students with a set of 10 modules that address ICT as a critical component for achieving the Sustainable Development Goals (SDG). The course brings together thought leaders and changemakers from all regions of the world in fields related to ICT and sustainable development. It addresses the role of ICT in achieving the SDG in five important areas: (a) how digital technologies are empowering billions of people around the world by providing access to education, health care, banking, and government services; (b) how ICT is being used to inform smarter, evidence-based policies to improve people's lives in fundamental ways; (c) how these technologies can be used for measuring and monitoring the achievement of the SDG; (d) new challenges that technology can introduce, such as privacy, data management, risks to cybersecurity, e-waste, and the widening of social divides; and (e) ways in which stakeholders are coming together to answer big questions about what our future will look like in a hyper-digitized world.

In its 2024 edition, the course received 2,877 enrollments, which included learners from a wide range of countries. Since its launch in 2018, more than 10,000 learners from diverse backgrounds have enrolled in the course, reaffirming the relevance of continued discussions around the role of technologies in achieving the SDG.

COURSE MODULES:

Module 1: Welcome to the Digital Age

Module 2: Technology for Governments and Citizens

Module 3: ICT Infrastructure

Module 4: ICT Innovations in Health

Module 5: Learning in Knowledge Societies

Module 6: Promoting Financial Inclusion

Module 7: Measurement and Metrics

Module 8: Artificial Intelligence

Module 9: Concerns for our Digital Future

Module 10: The Way Forward

Languages: Videos in English; transcriptions in English, Spanish, Portuguese, and Russian.

Registration and more information: https://sdgacademy.org/course/tech-for-good/

MOOC // AI and the Rule of Law

The 2024 edition of the MOOC AI and the Rule of Law achieved over 5,389 registered individuals from 145 countries across Africa, Latin America and the Caribbean, the Arab States, Europe, North America, and Asia-Pacific. It was developed by UNESCO and The Future Society, with the support of Cetic.br|NIC.br, the National Judicial College, and the Institute of Electrical and Electronics Engineers Standards Association (IEEE SA), and contributions by the UNESCO Multi-Donor Programme on Freedom of Expression and Safety of Journalists (MDP) and the Open Society Foundations. It is an introductory course engaging judicial operators in a global discussion around Artificial Intelligence's (AI) application and impacts on the rule of law. The MOOC is structured in six modules, enabling the unpacking of the opportunities and risks associated with the adoption of AI technologies across justice systems and their impact on the administration of justice, with a focus on human rights, AI ethics, and governance issues.

The MOOC's target audience is judges, prosecutors, public defenders, and other stakeholders working for judicial branches, prosecution services worldwide, and sectors including legal technology companies. Other relevant audience groups include policymakers, academics, and civil society representatives.

Languages: English, French, Spanish, Russian, Chinese, Arabic, and Portuguese.

More information:
https://www.unesco.org/en/articles/training-judges-lawyers-and-prosecutors-artificial-intelligence-and-rule-law
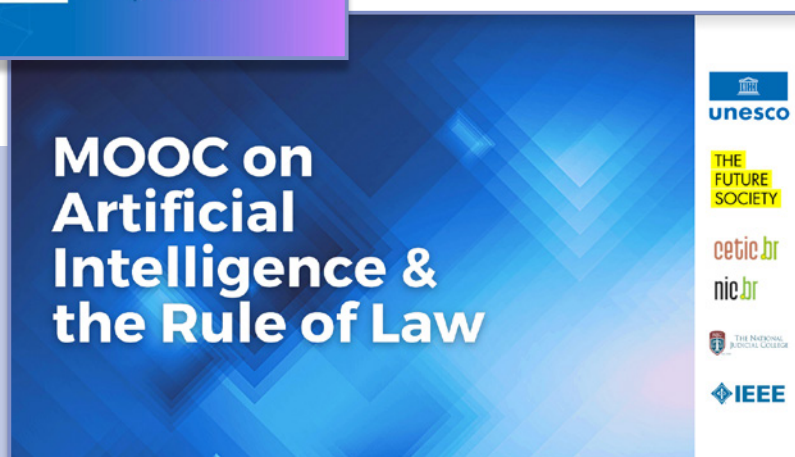
Methodological Support on Data Measurement for Strategic Partners

In 2024, the Regional Center for Studies on the Development of the Information Society of the Brazilian Network Information Center (Cetic.br|NIC.br) continued to work alongside strategic partners in the area of statistics production related to information and communication technology (ICT), data production and sharing, data analysis, and capacity-building on survey methodologies and innovative methods of data collection. Based on a multistakeholder approach, the Center works in close cooperation with partners from relevant areas of government (regulators, national statistical offices, ministries), academia, research institutes, and international organizations to develop an ICT measurement ecosystem that allows for the production of sound and updated data for policymaking and research. It also provides technical support and capacity-building programs to decision-makers and data producers in Latin America and Portuguese-speaking countries in Africa. Cetic.br|NIC.br is also an active player in the international arena. In recent years, it has been cooperating with national statistical offices in Latin America and with United Nations Economic Commission for Latin America and the Caribbean (ECLAC), United Nations Educational, Scientific and Cultural Organization (UNESCO), International Telecommunication Union (ITU), and Organisation for Economic Co-operation and Development (OECD) in the area of measurement, indicators, and survey methodologies.

UNESCO Internet Universality Indicators

The UNESCO Internet Universality Indicators were designed to enable stakeholders to assess Internet development at the country level and to provide recommendations for policy improvement, all in accordance with UNESCO's ROAM-X principles: R – Human Rights; O – Openness; A – Accessibility to All, and M – Multistakeholder Participation. Cetic.br|NIC.br's contribution to this global project started with the pilot implementation and completion of UNESCO's framework of Internet Universality Indicators (IUI) in Brazil in 2018, after which Brazil was the first country to complete an assessment based on the ROAM-X indicators, led by Cetic.br|NIC.br. In the following years, the Center continued to support the initiative by providing guidance to several countries during the implementation of the IUI framework.

The Center also supported UNESCO in the process of updating the IUI framework. The project included the production of a background report, based on desk research and meetings with partners; a consultation process that included interviews and online surveys with participant countries; and the production of the publication *Internet Universality: Advancing Inclusive Digital Transformation With ROAM-X Indicators.*

The events organized in 2024 around the IUI included:

- **NETmundial+10 - Expert Briefing on UNESCO's Revision of the Internet Universality Indicators (April 29)**. UNESCO and Cetic.br|NIC.br jointly held an expert meeting on the revision of UNESCO's IUI during NETmundial+10. The meeting was attended and presented by Tawfik Jelassi, Assistant Director-General (ADG) for Communication and Information, UNESCO and Anriette Esterhuysen, from the Association for Progressive Communications (APC).

- **WSIS Forum Internet Universality Indicators: Measuring ICT for Development (May 31)**. This session aimed to provide participants with insights into the ongoing revision process for the IUI, highlighting key areas of focus and soliciting feedback on the new draft. Discussions centered on the changing dynamics of the digital world and how the revised indicators can effectively address contemporary issues such as digital inclusion, data privacy, cybersecurity, and the impact of emerging technologies like Artificial Intelligence (AI).

- **ICEGOV 2024: Second Generation Internet Universality Indicators for Human-Centered Digital Governance (October 1)**: This session aimed to highlight how comprehensive assessments of national digital environments through the ROAM-X principles can facilitate evidence-based policymaking processes, delve into the current and potential new themes of the IUI, and encourage stakeholders to adopt and implement the IUI for enhanced assessment of national Internet environments.

- **IGF 2024: High Level Launch: Advancing the Universality of Internet 2.0 (December 15)**. Held during the 19th Annual Meeting of the Internet Governance Forum (IGF) 2024 in Riyadh, Kingdom of Saudi Arabia, the session featured the launch of the second generation of IUI in the context of the Sustainable Development Goals (SDG) and the 20th anniversary review of the World Summit on the Information Society (WSIS).

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

The Regional Center for Studies on the Development of the Information Society of the Brazilian Network Information Center (Cetic.br|NIC.br) is dedicated to the systematic production of indicators and statistics about information and communication technologies (ICT) access and use in Brazil in various sectors of society. 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. The Center also contributes to the development of these recommendations and actively participates in discussions about the indicators. In 2024, the Center participated in discussions held in various national and international forums dedicated to ICT methodologies and indicators, which focused on their review and definition. Some of those events are highlighted below.

Expert Group on ICT Household Indicators and Expert Group on Telecommunication/ICT Indicators, International Telecommunication Union

At the 12th meeting of the Expert Group on ICT Household Indicators (EGH) and the 15th meeting of the Expert Group on Telecommunication/ICT Indicators (EGTI), hosted by the International Telecommunication Union (ITU), members from Cetic.br|NIC.br actively engaged in the discussions pertaining to the work of the EGH and joint EGTI/EGH subgroups. Mr. Winston Oyadomari presented the report of the ICT Development Index (IDI) subgroup, which Cetic.br|NIC.br had been contributing to in the prior months.

Working Party on Digital Economics, Measurement and Analysis, Organisation for Economic Co-operation and Development

Cetic.br|NIC.br participated in the Working Party on Digital Economics, Measurement and Analysis (WP DEMA), coordinated by Organisation for Economic Co-operation and Development (OECD) , whose 35th and 36th sessions took place in OECD's headquarters in Paris, April 2-3 and November 14-15, respectively. The 35th session focused on topics such as measuring false and misleading content online and the production of data on Artificial Intelligence (AI) and digital intermediaries. The 36th session addressed how to measure cybersecurity, digital technologies and health, children's well-being in the digital age, and e-commerce.

Working Group on Measuring E-Commerce and the Digital Economy

Cetic.br|NIC.br has been part of a working group led by the United Nations Conference on Trade and Development (UNCTAD) that aims to promote cooperation in measuring electronic commerce and the digital economy. The 2024 event took place on December 11 and 12, and participants from several countries presented the advances and challenges of measuring the digital economy, with a special focus on the dissemination of good practices, comparability, and support for developing countries. More information about the event can be found at https://unctad.org/meeting/working-group-measuring-e-commerce-and-digital-economy-fifth-meeting

International Panel on Social Progress

Participation in the meeting of the International Panel on Social Progress (IPSP) as a member of the working group on Information as a Public Good. The group aims to contribute to discussions on how to develop new governance models for the digital ecosystem, focusing on a human rights-based approach, transparency of Artifial Intelligence (AI) and digital platform companies, human rights due diligence, news media viability, and user empowerment.

Frontiers in Digital Child Safety, from The Technical University of Munich (TUM), in collaboration with scholars from the University of Zurich and the Berkman Klein Center for Internet & Society.

Cetic.br|NIC.br joined the project's expert group. The project seeks to contribute to ongoing debates about novel ways to advance child safety while respecting privacy through a series of open-source materials, including research briefs, issue spotters, and technical descriptions. Cetic.br|NIC.br's participation included a presentation on the ICT Kids Online 2024 project and contributions to the expert group discussions.

Accelerating SDG through ICT
Contributions to the 2030 Agenda

SDG 4
QUALITY EDUCATION

The Regional Center for Studies on the Development of the Information Society of the Brazilian Network Information Center (Cetic.br|NIC.br) contributes to Sustainable Development Goals (SDG) 4 (Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all) through a range of activities, including the production of information and communication technologies (ICT) and education statistical data, the development of international frameworks, and support for policymakers in designing evidence-based ICT policies.

Each year, Cetic.br|NIC.br conducts the ICT in Education national survey, which tracks key indicators on access to and use of ICT, as well as digital skills among students, teachers, and school principals. Additionally, the ICT Households survey measures digital skills in the general population, following the International Telecommunication Union (ITU) framework. In contrast, the ICT Kids Online Brazil survey focuses on children and their parents or legal guardians. These data sources help monitor progress on Target 4.4, particularly Indicator 4.4.1.

In February 2024, Cetic.br|NIC.br shared its experience in producing indicators on access to, use of, and engagement with digital technologies in Brazilian schools and among the school community during the Conference on Education Data and Statistics, organized by United Nations Educational, Scientific and Cultural Organization (UNESCO) in Paris. The event brought together representatives from official statistical institutes, research centers, and UNESCO Member States.

In 2024, within the scope of principles disseminated in the United Nations (UN) Global Digital Compact (GDC), UNESCO launched a new round of consultations with experts and representatives from various sectors of society on the key aspects that should be prioritized in the development of digital open educational resources, considering the spread of emerging technologies such as Artificial Intelligence (AI). Cetic.br|NIC.br supported UNESCO in conducting the regional consultation focused on the Latin America and Caribbean region regarding the implementation of the 2019 UNESCO Recommendation on Open Educational Resources. Additionally, the research center participated in the 3rd UNESCO World OER Congress, held in Dubai in November, with a presentation in a panel dedicated to discussing sustainability and business models for OER.

Since 2013, UNESCO has annually organized the Mobile Learning Week to discuss the impact of digital technologies on education, particularly in teaching and learning processes. After 2020, the event was reformulated under the name Digital Learning Week, with the aim of deepening discussions on these resources while also addressing agendas related to the dissemination of AI-based systems in educational management and pedagogical practice, the role of digital platforms in education access, and the connection between these topics and the protection of students' rights. Each year,

Cetic.br|NIC.br participates in the event by sharing data on the Brazilian Basic Education context and contributing to meetings and discussion groups on critical topics related to technology-mediated education quality. In 2024, the event was organized by UNESCO in Paris in September.

In July 2024, Cetic.br|NIC.br also took part in the first Giga Connectivity Forum, an invitation-only event bringing together top officials from ministries of education, ICT, and communications regulatory authorities in Giga-participating countries. The forum provided a space for networking, assessing progress, and planning the path toward achieving universal school connectivity by 2030. Giga, a United Nations Children's Fund (UNICEF) and ITU initiative, aims to connect every school to the Internet and give every young person access to information, opportunities, and choices.

In support of UNESCO's knowledge production, the Center actively collaborated in the translation into Spanish of key UNESCO publications in the thematic area of AI and Education, including the "AI Competency Framework for Teachers" and the "AI Competency Framework for Students."

SDG 5
GENDER EQUALITY

Within the scope of knowledge production, all surveys conducted by Cetic.br|NIC.br with individuals and professionals allow for disaggregation by gender. Additionally, they provide data users with access to a comprehensive set of specific indicators on the subject. The topic is highlighted, in particular, in the two household surveys conducted annually by the Center: ICT Households and ICT Kids Online Brazil.

In 2024, Cetic.br|NIC.br initiated the project Digital Inclusion and Productive Inclusion in Brazil: Perspectives on Gender, Diversity, and Territorialities in partnership with the Inter-American Development Bank (IDB) and the Ministry of Women. The study is ongoing and consists of two main areas of analysis: a quantitative phase, which involves compiling national indicators on the topic at various levels of disaggregation; and a qualitative phase, focusing on rural women workers, including Indigenous women, Quilombolas, fishers, and small-scale farmers. The study will be published in September 2025.

Cetic.br|NIC.br has also been an active member of the EQUALS Research Coalition since 2017. EQUALS is a global partnership formed between ITU, UN Women, GSMA, International Trade Centre (ITC), and United Nations University (UNU) to promote gender equality in ICT access, skills, and leadership. The Coalition was established to ensure an evidence-based approach to activities to track progress toward the initiative's targets, and to generate and disseminate knowledge globally to address gender inequalities in science and technology. Cetic.br|NIC.br has been a member of the group since 2017 and was invited to contribute to the next discussions about EQUALS Research Report 2024, to be launched in 2025. In 2024, the Research Coalition Editorial Workshop was hosted by the Korea Advanced Institute of Science and Technology (KAIST) in Daejeon, South Korea.

Cetic.br|NIC.br also adopts gender balance criteria in the integration of panels at events, the selection of authors invited to participate in its publications, capacity-building activities, and the composition of research teams. The Center's team is made up of 10 men and 14 women. The composition of the Center's team of coordinators also presents gender balance.

SDG 9
INDUSTRY, INNOVATION AND INFRASTRUCTURE

Cetic.br|NIC.br continues to uphold its core projects and activities, supporting key initiatives under SDG 9 (Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation). The Center's knowledge production strategies play a vital role in measuring SDG 9 through nationwide surveys on ICT adoption in enterprises, households, and by Internet service providers (ISP). These surveys are essential for understanding both the supply and demand sides of ICT goods and services in Brazil, which are crucial for digital transformation and the growth of the digital economy.

Cetic.br|NIC.br also actively participates in international working groups that define concepts and frameworks for measuring the digital economy. These groups, led by organizations such as Organisation for Economic Co-operation and Development (OECD), ITU, United Nations Conference on Trade and Development (UNCTAD), and United Nations Economic Commission for Latin America and the Caribbean (ECLAC), work to promote the production of comparable indicators across countries.

In particular, Cetic.br|NIC.br's data production efforts contribute to monitoring Target 9.c, which aims to expand ICT access and ensure universal and affordable Internet connectivity in the least-developed countries.

In addition, Cetic.br|NIC.br produces regular publications focusing on the innovative use of digital technologies and digital transformation. Capacity-building strategies developed by the Center also contribute to raising awareness among policymakers and key actors about emerging issues such as AI, innovative data collection methods, and alternative data sources such as Big Data. In 2024, Cetic.br|NIC.br also supported ongoing projects involving data collection on emerging technologies (such as AI and the Internet of Things [IoT]) in enterprises, in partnership with the OECD.

The main activities related to SDG 9 carried out during 2024 included: (a) the 14th NIC.br Annual Workshop on Survey Methodology, whose theme was "Improving ICT Data Quality and Availability: Combining New Methodological Approaches"; (b) the School of Digital Transformation and Innovation in Latin America, held between September 30 and October 3 in São Paulo, Brazil, in partnership with ECLAC, CAF, and the Internet Technical Community (Latin American and Caribbean Internet Addresses Registry [LACNIC], Internet Corporation for Assigned Names and Numbers [ICANN], Internet Society, LACTLD, Latin American and Caribbean Internet Exchange Association [LAC-IX], LACNOG, Red CLARA); and (c) the School of Digital Transformation and Innovation in the Caribbean, held between August 12 and August 15 in Port of Spain, Trinidad and Tobago, in partnership with Caribbean Telecommunications Union (CTU), ECLAC, CAF, the Internet Technical Community (LACNIC, ICANN, Internet Society, LACTLD, LAC-IX, LACNOG, Red CLARA) and the University of the West Indies (UWI).

The Center also supported the G20 Digital Economy Working Group (DEWG) under Brazil's presidency of the group in 2024, which approved a Digital Economy Declaration and endorsed four priority areas. Cetic.br|NIC.br supported the production of deliverables related to two priorities of the working group: universal and meaningful connectivity and AI.
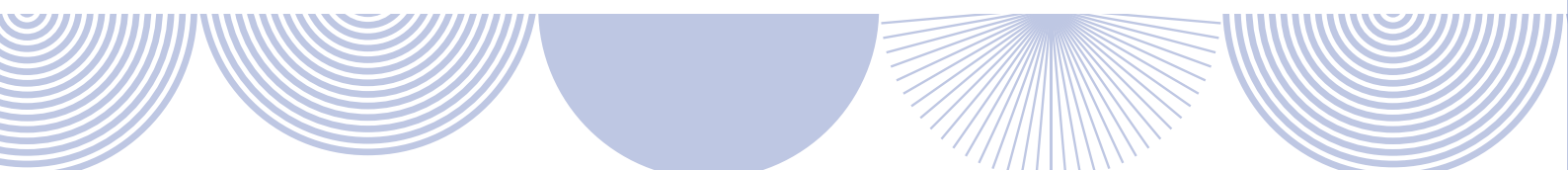
SDG 16
PEACE, JUSTICE AND STRONG INSTITUTIONS

Cetic.br|NIC.br's ICT Electronic Government survey is a key contribution to SDG 16 (Promote peaceful and inclusive societies for sustainable development, provide access to justice for all, and build effective, accountable, and inclusive institutions at all levels). This survey measures the digital transformation of public administration across federal, state, and local levels in Brazil, providing essential data to inform digital government policies. It also includes a smart cities module, offering insights into ICT adoption by local governments. Additionally, Cetic.br|NIC.br actively participates in international discussions on digital government and smart cities.

Beyond e-government, Cetic.br|NIC.br monitors digital transformations in the health and education sectors, identifying advances and barriers to adopting ICT solutions—critical elements for progress under SDG 16. The ICT Enterprises survey further contributes by providing data to support policies that promote innovative ICT solutions in the business sector.

In 2024, Cetic.br|NIC.br co-organized sessions at the International Conference on Theory and Practice of Electronic Governance (ICEGOV), held in South Africa. The Center played a central role in discussions on digital governance, AI governance, and data-driven policymaking. Staff presented the paper *Electronic Government and Meaningful Connectivity Levels*, participated in a roundtable on ethical data practices for fair labor and sustainable business models, and engaged in workshops on the Local Online Service Index (LOSI) of the UN E-Government Survey and the Second Generation Internet Universality Indicators for Human-Centered Digital Governance. They also contributed to a roundtable on AI for inclusion and human-centered digital futures in Africa.

Cetic.br|NIC.br further supported international cooperation by participating in the Information for Development Working Group under UNESCO's Information for All Programme (IFAP), fostering partnerships to build inclusive and sustainable knowledge societies. Another significant contribution to SDG 16 was the 2024 edition of the Massive Open Online Course (MOOC) Artificial Intelligence and the Rule of Law. This introductory course engaged judicial professionals regarding the application and impact of AI in legal systems. In 2024, the course reached 5,389 registered participants from 145 countries. Developed by UNESCO and The Future Society, the course was supported by Cetic.br|NIC.br, the National Judicial College, and the Institute of Electrical and Electronics Engineers (IEEE).
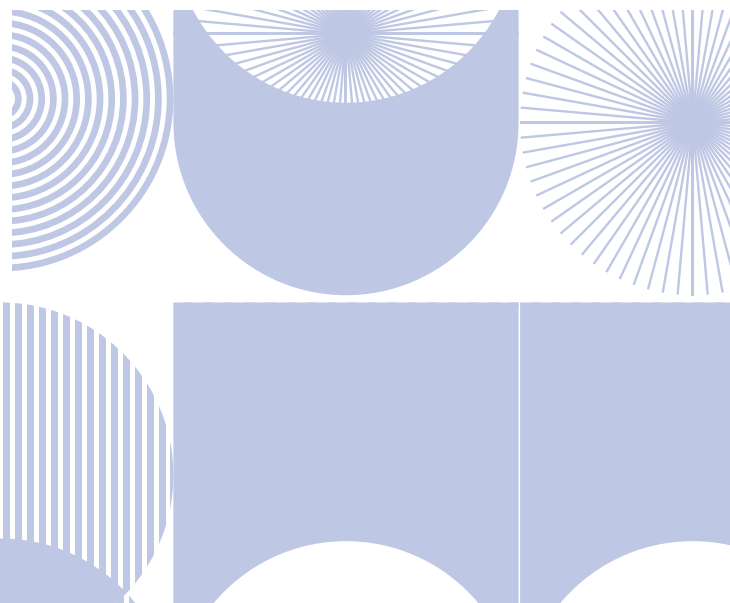
Cooperation Networks

In 2024, the Regional Center for Studies on the Development of the Information Society of the Brazilian Network Information Center (Cetic.br|NIC.br) enhanced its cooperation with government agencies and regional collaboration networks across Latin America and Portuguese-speaking African countries, fostering evidence-based policy development. These efforts facilitated knowledge exchange, the adoption of shared frameworks for information and communication technologies (ICT) data collection, and improved regional comparability.

Brazilian Presidency at G20

Contributions to the G20 Digital Economy Working Group (DEWG)

Cetic.br|NIC.br has played an important role in the Brazilian Presidency of G20 held in 2024. Following the priorities defined by the G20 Digital Economy Working Group (DEWG), the Center led three publications, two of them directly related to the Artificial Intelligence (AI) debate. Produced in collaboration with the Ministry of Science, Technology and Innovation (MCTI), the Brazilian National Data Protection Authority (ANPD), and United Nations Educational, Scientific and Cultural Organization (UNESCO), both built on large-scale quantitative data from various international sources and on original data from a questionnaire based on the Readiness Assessment Methodology applied to exploring how countries are addressing the development of AI technologies in its multiple dimensions (social, cultural, ethical, economic, etc.).

The Toolkit for Artificial Intelligence Readiness and Capacity Assessment brings insights for G20 countries—plus seven guest countries—on multiple aspects of AI development, such as AI-enabling infrastructures, institutional arrangements and mechanisms for its application, capacity-building programs, initiatives around ethical, cultural and social implications, and legal and regulatory measures. The report Mapping the Development, Deployment and Adoption of AI for Enhanced Public Services in the G20 Members: Artificial Intelligence for Inclusive Sustainable Development and Inequalities Reduction, in its turn, focuses mainly on the approaches and methodologies that countries are adopting for enhancing the provision of public services through AI, improving efficiency and citizen engagement while reducing costs and implementing guardrails for preventing the introduction of new risks and inequalities.

Cetic.br|NIC.br made a significant contribution to advancing the G20 Digital Economy Working Group's priority of universal and meaningful connectivity during Brazil's presidency. In collaboration with the International Telecommunication Union (ITU) and Ministry of Communications (MCom), Cetic.br|NIC.br contributed to the development of the report Universal and Meaningful Connectivity: A Framework for Indicators and Metrics. A summary of this framework was incorporated into the G20 Digital Economy Declaration, highlighting not only the key dimensions for measuring meaningful connectivity but also the importance of data that reflects social and economic diversity. This emphasis underscores the need to ensure that the opportunities of the digital world are accessible to all.
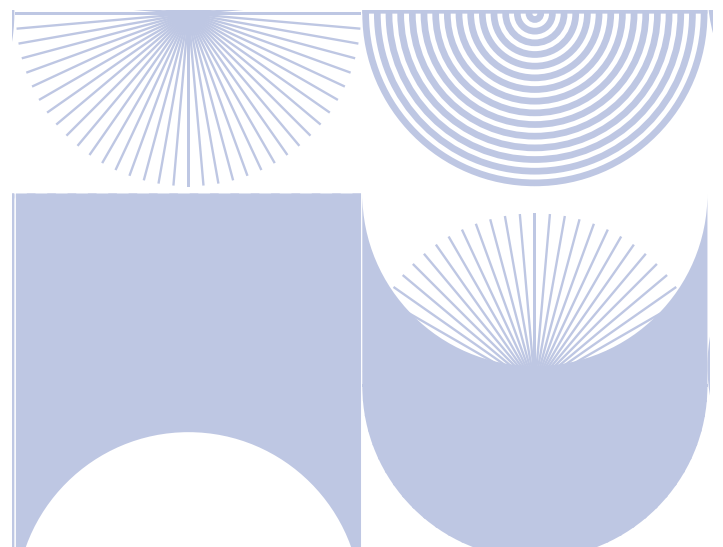
UN Big Data Regional Hub in Brazil

In 2024, Cetic.br|NIC.br continued its role as a member of the council and the technical advisory group of the United Nations (UN) Big Data Regional Hub in Brazil, working closely with IBGE, the Brazilian National Statistical Office (NSO), and the host of the hub. The hub remains dedicated to advancing the use of Big Data to enhance the production of official statistics, fostering knowledge sharing and the development of innovative initiatives across Latin America and the Caribbean. The initiatives carried out with Cetic.br|NIC.br in 2024 were:

Webinar: Sampling and Price Inference for Virtual Markets. This seminar, held on May 17, discussed an experiment that used data scraping algorithms to sample and infer prices from the virtual commerce of cell phones.

- Webinar: Correction of Bias in Estimating COVID-19 Cases in Brazil. This seminar, held on April 19, addressed the attempt to account for bias present in the estimation of COVID-19 infections of the Brazilian population from the administrative register of tests published by the Ministry of Health.
- Webinar: Weighting a Non-Probabilistic Sample to Estimate Internet Quality Indicators for Brazilian Schools. This seminar, held on March 15, addressed the weighting of a non-probability sample to estimate Internet quality indicators for Brazilian schools.

Besides these seminars, other activities to which Cetic.br|NIC.br contributed were:

- Webinar: Use of Mobile Phone Data for Public Policies.
- The V Workshop on the Use of Big Data for Official Statistics.
- The 8th International Conference on Big Data and Data Science for Official Statistics.
- Webinar: Innovations in Agricultural Statistics through Earth Observation (EO) and Artificial Intelligence (AI).
- Webinar: Big Data in the Production of Hydrogeological Disaster Alerts and Climate Change Studies.
- The 5th United Nations World Data Forum
- Webinar: Harnessing the Potential of New Data Sources for Better Measurement of Tourism Sustainability.
- UN Datathon 2024.
- Webinar: Climate Change and Disaster Metrics in Latin America and the Caribbean: Advances and Challenges.
- Webinar: UN Task Team on Training, Skills, and Capacity Development

ICT and Children
Kids Online Networks

Cetic.br|NIC.br contributes to advancing children's digital rights at the regional level by strengthening the Latin American Kids Online network, supported by United Nations Children's Fund (UNICEF) Latin America and the Caribbean and United Nations Economic Commission for Latin America and the Caribbean (ECLAC). These efforts generate evidence on children's and adolescents' Internet use, informing policies, programs, and regulations.

In 2024, the Center provided methodological support to UNICEF Argentina for the upcoming Kids Online national survey, assisting with questionnaire design and fieldwork planning. The report, set for release in May 2025, will provide key insights into children's Internet access, usage, risks, and coping strategies.

Additionally, on January 25-26, Cetic.br|NIC.br participated in the Special Meeting of Ministers of Education of Latin America and the Caribbean in Santiago, Chile. Organized by UNESCO, Chile's Ministry of Education, Development Bank of Latin America (CAF), the World Bank, ECLAC, and UNICEF, the event focused on shaping policies to drive educational recovery and transformation in line with the 2030 Agenda.

ICT and Government

Cooperation with the United Nations University Operating Unit on Policy-Driven Electronic Governance (UNU-EGOV)

In 2024, Cetic.br|NIC.br strengthened its collaboration with UNU-EGOV through a series of strategic initiatives. The cooperation agreement between the two institutions was renewed, reinforcing their long-term partnership. As part of their joint efforts, they published the policy brief *Citizen-Centered Digital Government: Approaches for Advancing the Public Sector's Use of Technologies Based on Demand-Side Data*, for ThinkTwenty (T20), contributing to discussions among G20 countries on this topic.

Additionally, Cetic.br|NIC.br actively participated in panels and workshops at ICEGOV 2024 in Pretoria, South Africa, organized by UNU-EGOV. The Center also sent a visiting researcher (Jan-Mar 2024) to conduct studies on smart city measurement methodologies, further advancing research in this field.

Furthermore, a technical cooperation initiative on survey methodologies was carried out between the Information Society Area of the Agency for e-Government and the Information and Knowledge Society (Agesic – Uruguay) and Cetic.br|NIC.br in support of IDB's Digital Transformation for a Smart Country operation. This activity took place in Montevideo, Uruguay, from November 25 to 29, 2024.

ICT in Health

Cetic.br|NIC.br continued providing technical support to Colombia's Ministry of Health and Social Protection for the implementation of the national survey on ICT use in healthcare, whose in-person initial methodology transfer workshop was funded by IDB and held in Bogotá in the previous year.

In 2024, Cetic.br|NIC.br also participated in a regional event discussing the production of digital health indicators organized by the Latin American University Telemedicine Network (RUTE-AL). During the event, Cetic.br|NIC.br presented the historical process of developing the ICT in Health survey over the past 10 years, the collaborations established with Latin American countries in recent years, and the results of the 2024 edition.
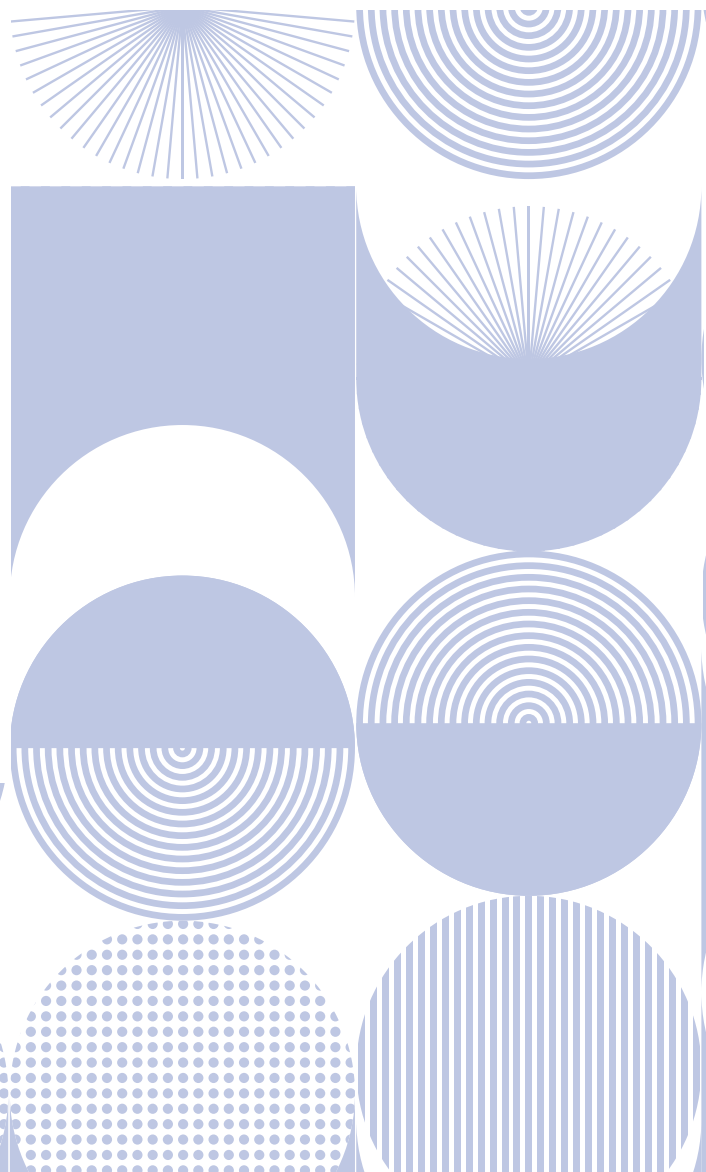
Dialogue With Stakeholders

nformation and communication technologies (ICT) are a key cross-cutting technology that impacts multiple sectors and requires the involvement of multiple and diverse stakeholders in the development of knowledge and information 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 Regional Center for Studies on the Development of the Information Society of the Brazilian Network Information Center (Cetic.br|NIC.br). In 2024, there were 10 ongoing cooperation agreements 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. Below are some of the important actions carried out by the Center in 2024 that allowed for closer ties with multiple and diverse stakeholders throughout the year, reinforcing its commitment to the dissemination of information and knowledge.

Policy Dimension:
Digital Economy

In 2024, Cetic.br|NIC.br continued its involvement in international research projects. One example is participation in the committee that evaluates the indicators that make up the Latin American Artificial Intelligence Index, led by the National Center for Artificial Intelligence of Chile (CENIA), which includes various stakeholders from the AI ecosystem in the region. The goal of the index is to evaluate AI production and adoption in the region, aiming to inform public policies that support the region's technological maturity by identifying challenges and opportunities.

Cetic.br|NIC.br also took part in two Working Groups in the context of the eLAC 2024 Conference, one devoted to meaningful connectivity and another to data production in Latin America and the Caribbean.

In 2024, Cetic.br|NIC.br participated in several meetings on the challenges of improving the competitiveness of Brazilian manufacturing, with the aim of generating subsidies for the new industrial policy and led by the Ministry of Development, Industry, Commerce and Services (MDIC). The indicators from the ICT Enterprises survey helped identify needs and establish goals, returning to an annual frequency to monitor the effects of the policy on the digital maturity of Brazilian companies.

Digital Government

Cetic.br|NIC.br actively participated in ICEGOV 2024, which took place in Pretoria, South Africa between October 1 and 4. Javiera Macaya (Cetic.br|NIC.br) presented the paper *Electronic Government and Meaningful Connectivity Levels* and contributed as a panelist in the roundtable Ethical Data Practices for Fair Labor and Sustainable Business Models, organized by the German Corporation for International Cooperation (Deutsche Gesellschaft fur Internationale Zusammenarbeit [GIZ]). Manuella Maia Ribeiro (Cetic.br|NIC.br) participated in the workshops Local Online Service Index (LOSI) of the United Nations E-Government Survey, promoted by UN DESA, and Second Generation Internet Universality Indicators for Human-Centered Digital Governance, co-organized by Cetic.br|NIC.br and UNESCO. Additionally, she took part of the roundtable session Building Information for All in Africa: Artificial Intelligence for Inclusion and Human-Centered Digital Futures.

As part of its collaboration with the Brazilian Ministry of Management and Innovation in Public Services (MCTI), Cetic.br|NIC.br presented the results of the ICT Electronic Government 2023 survey at the National School of Public Administration (ENAP) in Brasília on July 4, 2024. In the morning, a closed meeting took place with Brazilian Federal Public Administration managers.

The meeting featured opening remarks by Rogério Mascarenhas, the Secretary of Digital Government; Nathália Teles, the acting president of ENAP; and Fábio Senne from Cetic.br|NIC.br. This was followed by a presentation by Manuella Ribeiro, also from Cetic.br|NIC.br, who shared the main results from the latest edition of the survey. The meeting gathered representatives from key APF institutions, including the Office of the Comptroller General (CGU), the Ministry of Health, and the Ministry of Science, Technology, and Innovation (MCTI). In the afternoon, survey findings were presented again in a public event to all interested participants. This session attracted attendees from organizations such as the Federal Court of Accounts (TCU), the University of Brasília (UnB), FGV Brasília, Amazon, and IBM.

ICT in Education

In 2023, Cetic.br|NIC.br participated in national and international forums, contributed to collaboration networks and working groups on technologies and education, and disseminated indicators that were utilized by academic research centers, government institutions, civil society organizations, and international entities in the production of policy briefs, public policies, studies, and initiatives in support of education.

Throughout the year, a project for developing instruments to measure students' digital skills, carried out in partnership with the Telefônica Vivo Foundation and the Inter-American Development Bank (IDB), generated new debates through webinars featuring experts on the topic. These virtual meetings culminated in the in-person seminar Assessment of Students' Digital Competencies: Perspectives for Implementation in Brazil, held in August in Brasília, with the participation of representatives from the Secretariat of Basic Education (SEB) of the Ministry of Education (MEC); the National Institute for Educational Studies and Research "Anísio Teixeira" (Inep); and the International Student Assessment Program (PISA), conducted by the Organisation for Economic Co-operation and Development (OECD).

In 2024, the growing debate about ensuring the protection of children's and adolescents' rights in online environments increased the demand for data and evidence to support policies and regulatory initiatives. These policies include restrictions on the use of mobile devices in schools, the adaptation of digital platform resources to better serve this population's best interests, and the promotion of digital education among students and educators. In April, Cetic.br|NIC.br gave presentations at two significant seminars on these topics. The first was the seminar and workshop series Digital Education: Inclusive Pathways for Curricular Transformation in Basic Education, organized by SEB|MEC. Its goal was to discuss actions to expand digital education in schools within the scope of the National Digital Education Policy (Law No. 14,533, of January 11, 2023) and the National Strategy for Connected Schools (Decree No. 11,713, of September 26, 2023).

Another important event in April was the Media Education Seminar, promoted by the Social Communication Council of the National Congress. The panel featuring the Cetic.br|NIC.br team included representatives from the federal government, such as SEB|MEC, the Social Communication Secretariat of the Presidency of the Republic (SECOM), and United Nations Educational, Scientific and Cultural Organization (UNESCO). The objective was to discuss the concept of media education and its importance for Basic Education and public policy development in this area.

Also this year, Cetic.br|NIC.br worked jointly with UNICEF and UNESCO in the development of policy briefs and the planning of educational policies. Examples of these collaborations include Cetic.br|NIC.br's participation in the visit of a representative from the GIGA project (United Nations Children's Fund [UNICEF] and International Telecommunication Union [ITU]) to NIC.br, facilitated by the Center of Study and Research in Network Technology and Operations (Ceptro.br), and its support for UNESCO in the technical review and translation of the *AI Competency Framework for Students* and the *AI Competency Framework for Teachers*, which are expected to be released in Portuguese and Spanish in 2025.

Children's rights

Cetic.br|NIC.br joined the working group for the development of the guide *Children, Teens, and Screens: A Guide to Using Digital Devices* (*Crianças, Adolescentes e Telas: Guia sobre Uso de Dispositivos Digitais*). The work was coordinated by the Digital Policies Secretariat of the Secretariat of Social Communication (SECOM-PR) and involved the participation of six additional ministries – the Civil House of the Presidency, Education, Health, Justice and Public Security, Human Rights and Citizenship, and Social Development, Family, and Hunger Eradication – as well as representatives from civil society. The guide provides recommendations on the healthy use of screens while promoting practices that reduce the risks associated with excessive use of digital devices. It is intended for parents, guardians, educators, and health professionals.

ICT in Health

In 2020, the Technical Committee (CT) on Digital Health of the National Education and Research Network (RNP) was launched. It aims to serve as a forum for studying the future of applications, products, services, and aspirations in digital health across various research, development, and innovation areas. Cetic.br|NIC.br was invited to participate in this Committee and Luciana Portilho coordinated the study group Accelerating the Training of Workers and Professionals in Digital Health Practice. In 2024, the ICT developed the report *Vision of the Future of Digital Health 2024*. Using the World Health Organization (WHO) Classification of Digital Health Intervention Methodology, this report presented the main priorities, challenges, and trends for digital health in Brazil.

Cetic.br|NIC.br also participated in the Technical Group for the development of the National Maturity Index for Digital Health, organized by the Information and Digital Health Secretariat of the Brazilian Ministry of Health. Contributions were related to the methodology and data collection instrument, using the experience and indicators of the ICT in Health survey.

Cetic.br|NIC.br has a partnership with the Brazilian Company of Hospital Services (EBSERH), which is responsible for the administration of some of the university hospitals in Brazil that are included in the survey sample. The results were presented at seminars to EBSERH's technical staff, organized by this institution. In 2024, representatives from EBSERH contributed to the dissemination of the survey among their associates to encourage participation in the interviews.

Cetic.br|NIC.br has a cooperation agreement with the National Council of Municipal Health Secretaries (CONASEMS) that aims to expand the dissemination of the results of the ICT in Health survey in municipalities and guarantee that a representative of the Council will serve as a specialist who participates in Cetic.br|NIC.br's expert group meetings for the survey consultations, among other contributions. In 2024, the cooperation contributed to the dissemination of the ICT in Health survey to municipal health secretaries.

Measurement and Data Production for Policymaking

In 2024, Cetic.br|NIC.br continued its collaboration with the SEADE Foundation—the official statistics agency of the São Paulo State government—advancing efforts to share information, refine research methodologies through technological innovations, and conduct joint studies. As part of this partnership, the agency published five analytical studies in 2024:

- Digital Skills (February 2024);
- Use of Electronic Services of the Government of São Paulo (February 2024);
- Internet Consumption Habits (May 2024);
- App Consumption Habits (June 2024);
- ICT Access Infrastructure at Home, Individual Internet Access Characteristics and e-government (July 2024);
- Infrastructure for Internet and Mobile Phone Access and Usage in Schools (December 2024).

Producing Knowledge about ICT

The production and sharing of knowledge about themes related to knowledge and information societies are the most important lines of action of Regional Center for Studies on the Development of the Information Society of the Brazilian Network Information Center (Cetic.br|NIC.br). In 2024, Cetic.br|NIC.br actively participated in several academic discussion forums, including presenting survey results and data analyses, debating methodological challenges, promoting thematic discussions, and proposing discussion panels with important stakeholders. Relevant events in which the Center participated in 2024, including those presenting and sharing what the Center is producing, are listed below.[6]

Culture and Technologies

- XIII International Seminar on Cultural Policies (FCRB). Presentation: Challenges for the Cultural Sector in the Post-Pandemic Scenario: An Overview of Data from the ICT Culture 2022 Survey. In person, Rio de Janeiro, Brazil. May 2024.

Digital Government

- Smart Cities Measurements and Challenges to Address the Local Context (UNU-EGOV). In person, Guimarães, Portugal. February 2024.

- 3rd Digital Government Meeting with São Paulo State Government Organizations and Entities (Prodesp). Presentation: São Paulo's Population and Digital Government. In person, São Paulo, Brazil. April 2024.

- RJ Dialogues: The Advantages and Challenges of Digital Governance. Panel: Connection and Information: Difficulties in Including Citizens (O Globo and Rio de Janeiro state government). In person, Rio de Janeiro, Brazil. May 2024.

- Smart City Business Brazil Congress (Smart City Business). Strategic Meeting 7: Artificial Intelligence and Its Impacts on Urban Management of Smart Cities. In person. São Paulo, Brazil. May 2024.

- XXV March to Brasilia in Defense of Municipalities (CNM). Panel: The Path from Traditional Management to a Smart Municipality in Practice. In person, Brasília, Brazil. May 2024.

- School on Internet Governance (CGI.br). Course: Internet and Communication: Impacts of Internet Private Control and Cultural Diversity Online. In person, Rio Grande do Norte, Brazil. June 2024.

- FutureCom (Informa Markets). Panel: Artificial Intelligence in the Public Sphere. In person, São Paulo, Brazil. October 2024.

- E-Society 2024 Conference (IADIS). Privacy and Digital Government: Perspectives from Public Organizations in Brazil. In person, Porto, Portugal. March 2024.

Education and Children's Rights

- Safer Internet Day (CGI.br and SaferNet Brasil). Town Hall: Excessive Use of Screens by Children and Adolescents in Brazil: What To Do? In person, São Paulo, Brazil. February 2024.

- 1st Webinar: Digital Natives and Skills for the Responsible Use of Technology (Fundação Telefônica Vivo). Online. February 2024.

- Cycle of Seminars and Workshops on Digital Education: Inclusive Paths for Curricular Transformation in Basic Education (MEC). Panel: Curricular Challenges of Digital Education. Online. April 2024.

- Workshop: Sharing Responsibly: Perspectives and Cautions on 'Sharenting' (TikTok). In person, São Paulo, Brazil. April 2024.

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6   The names of the events listed here were freely translated.

- Course: Adolescence: Mental Health and Interactive Media (PUC-SP). Presentation of ICT surveys. Online. April and September 2024.

- Generative Artificial Intelligence in higher education: Potentialities and challenges (CEPI). In person, São Paulo, Brazil. June 2024.

- International Congress on Education and Technologies and Distance Learning 2024 (UFSCAR). Online. July 2024.

- I International Congress on Researcher Training – CIFOP and VI International Seminar on Researcher Training – SIFOP (PUC-PR). Panel: Perspectives and paths for researchers in education: Excellence in training and labor marketing. Online, August 2024.

- CELG Journey 2024 (CELG). Panel: Childhood and Technology. Online. September 2024.

- 24th Annual Meeting of the Network "Nossas Crianças" (Abrinq Foundation). Thematic Room: Connected and Safe: Protection of Children in the Digital Environment. In person, São Paulo, Brazil. September 2024.

- EDUTECIA Debate Cycle (EDUTECIA). Presentation of ICT surveys, focusing on ICT in Education. Online, Brazil. September 2024.

- BRICS Digital Forum 2024 (BRICS). Session: Infrastructure Development Determines Society's Development. Online. September 2024.

- Conscious Screen (Meta). In person, São Paulo, Brazil. October 2024.

- Talk Series: Well-being of Young People Online (Google/YouTube). In person, São Paulo, Brazil, October 2024.

- 9th Symposium on Children and Adolescents on the Internet 2024 (NIC.br|CGI.br). Panel: Launch of ICT Kids Online Brazil 2024 data. In person, São Paulo, Brazil. October 2024.

- Children in the Digital Environment: The Role of Families and Schools (UFPR). Roundtable: Risks of Increased Internet Use by Children. Online. October 2024.

- 3rd UNESCO World Open Educational Resources Congress (UNESCO). Presentation: Promoting Open Knowledge on the Impacts of Digital Transformation on Society. In person, Dubai, United Arab Emirates. November 2024.

Health and Technologies

- E-Society 2024 Conference (IADIS). Digital Transformation in the Healthcare Sector in Brazil and the Effects of the Pandemic on Public Health. In person, Porto, Portugal. March, 2024.

- First Responsible AI Seminar at Cátedra Oscar Sala (USP). Panel: AI in Health. In person, São Paulo, Brazil. October 2024.

- Seminar: Digital Health and Artificial Intelligence in SUS: Challenges and Perspectives (ENSP/Fiocruz). Panel: Impacts and Possibilities of Using Artificial Intelligence in the SUS. In person, Rio de Janeiro, Brazil. October 2024.

- 3rd SW-BR Workshop in Digital Health, Artificial Intelligence, and Machine Learning (Embassy of Sweden). In person, Santa Catarina. Brazil. November 2024.

- Seminar: Recent Advances in Digital Health (Health Commission of the Chamber of Deputies in Brasilia). Panel: Financing and Expanding the Use of Technologies. In person and online, Brasília, Brazil. November 2024.

- 5th Brazilian Congress on Health Policy, Planning, and Management (Abrasco). Participation in the workshop on digital health indicators with representatives from civil society, the public sector, academia, and health councils. In person, Fortaleza, Brazil. November 2024.

- Brazilian Congress on Health Informatics – CBIS (SBIS). Panel: What to Monitor and How to Evaluate Digital Health in the Next 5 Years. In person, Belo Horizonte, Brazil. October 2024.

- Brazilian Congress on Health Informatics – CBIS (SBIS). Panel: Artificial Intelligence in Health: Potential, Risks, and Perspectives for Brazil. In person, Belo Horizonte, Brazil. October 2024.

Households and Digital Inclusion

- Guest lecture: Digital Society and Democracy (FGV-EAESP). In person, São Paulo, Brazil. April 2024.

- Net Neutrality 10 Years on: The Path to Meaningful Connectivity (ITS Rio). Panel: Regulating for Meaningful Connectivity. In person, São Paulo, Brazil. April 2024.

- WSIS+20 Forum High-Level Event 2024 (ITU, UNESCO, UNDP, AND UNCTAD). In person, Geneva, Switzerland. May 2024.

- 25th March to Brasília in Defense of Municipalities (CNM). In person, Brasília, Brazil. May 2024.

- ITU Regional Workshop for the Caribbean on Promoting and Measuring Universal and Meaningful Connectivity (ITU). Panel: Country Roundtable on UMC Data. In person, Nassau, Bahamas. June 2024.

- Café Digital - Internet in Brazil: Are We Really Connected? (BNDES). Online, July 2024.

- Telecom Access Credit Seminar (IDB and MCom). Panel: Meaningful and Universal Connectivity – How to Connect Rural Areas, Peripheries, and Small Towns. In person, Brasília, Brazil. September 2024.

- Amazon On: Connectivity & Sustainability. Panel: Meaningful Connectivity for the Amazon Communities. In person, Manaus, Brazil. September 2024.

- BRICS Digital Forum (Russian Presidency). Panel: Digital Infrastructure session. Infrastructure Development Determines the Development of Society. Online, September 2024.

- Innovation Week 2024 (ENAP). Panel: Launch of the ICT Households 2024 survey results. In person, Brasília, Brazil. October 2024.

- Political Dialogue on Connectivity and Inclusion – EU-LAC Digital Alliance (ECLAC). In person, Santiago, Chile. November 2024.

- 9th Ministerial Conference on the Information Society in Latin America and the Caribbean (ECLAC). Session: Reducing Inequality and Promoting Inclusion: Digital Technologies as Tools for Inclusion and Empowerment. In person, Santiago, Chile. November 2024.

- UN World Data Forum 2024 (UNSD). Panel: The Importance of Demand-Side Data on Digital Access and Use for Evidence-Based Policymaking in Africa. In person, Medellín, Colombia. November 2024.

- XXIX International Congress of the Latin American Center for Development Administration (CLAD). Round table: Transversality, Intersectionality and Intersectorality in Public Policies: Paths to Equity. In person. Brasília, Brazil. November 2024.

- Webinar: Challenges of Digitalization in the Rural Southern Cone (PROCISUR). Panel: Experiences: Digital Transformation, Social Change, and Inclusion. Online. December 2024.

- Internet Governance Forum 2024 (IGF). In person. Riyadh, Saudi Arabia. December 2024.

- 2024 Annual Conference of the Society for the Advancement of Socio-Economics (SASE). Presentation: Challenges of Digital Inclusion in Brazil: An Analysis of Gender and Race in the Advancement of the Digital Economy. In person, Limerick, Ireland. June 2024.

- 32nd Annual Conference of the International Association for Feminist Economics (IAFFE). Panel: Gender Digital Gaps: Aspects and Challenges in Women's Labor Force. In person, Rome, Italy. July 2024.

- CPR Latam 2024. Presentation: The Digital Gender Divide and the Challenges of Productive Inclusion. In person, Brasília, Brazil. August 2024.

Productivity and the Digital Economy

- PINTEC Semestral Presentation and Debate on Innovation in Brazilian Industry (CNDI/MDIC). In person, Brasília, Brazil. March 2024.

- Webinar: Driving the Future: Integrating Artificial Intelligence and Digital Platforms for Innovation and Growth (ABES). Online. March 2024.

- IoT Forum - Quantifying IoT in Brazilian Industrial Companies (Fórum Brasileiro de IoT and Cetic.br|NIC.br). In person, São Paulo, Brazil. March 2024.

- 1st Brazilian Congress on Artificial Intelligence in Law (OAB-SP). In person, São Paulo, Brazil. March 2024.

- Artificial Intelligence for Social Equity and Sustainable Development (G20). In person, Brasília, Brazil. April 2024.

- Legal Challenges of Artificial Intelligence (Legal Grounds Institute). Class: AI Applications in Multiple Sectors and Its Impacts on the Economy and Labor Market. Online. April 2024.

- Connected Smart Cities (ABES). In person, São Paulo, Brazil. April 2024.

- Abrint National Meeting 2024 (Abrint). Panel: Meaningful Connectivity: Redesigning the Role of Providers. In person, São Paulo, Brazil. June 2024.

- IT Forum Na Mata 2024 (IT Forum). In person, São Paulo, Brazil. June 2024.

- New Trends in Consumer Law and Economics (FGV Rio). In person, Pernambuco, Brazil. June 2024.

- 3rd OBIA Workshop (OBIA). In person, São Paulo, Brazil. September 2024.

- Launch Event for the Latin American Artificial Intelligence Index (ECLAC). Panel: Challenges for the Development of AI Institutionalization and Regulation. In person, Santiago, Chile. September 2024.

- 18th Info.Unesp 2024 (Unesp). Lecture: OBIA, Metrics, and Measurement Processes on AI Impacts and Adoption. In person, São Paulo, Brazil. October 2024.

- Webinar: Ethical Data Practices for Fair Labour and Sustainable Business Models (GIZ). Online. November 2024.

- IEEE International Conference on Cloud Networking (CloudNet). In person. Rio de Janeiro, Brazil. November 2024.

Privacy and Data Protection

- Seminar on Privacy and Personal Data Protection (NIC.br|CGI.br). Launch of the publication: Privacy and Personal Data Protection 2023: Perspectives of Individuals, Enterprises and Public Organizations in Brazil. In person and online, São Paulo, Brazil. September 2024.

- Data Privacy Global Conference 2024 (Data Privacy Brasil). In person, São Paulo, Brazil. November 2024.

Quantitative Methodologies and Statistics

- Conference on Foundations and Advances of Machine Learning in Official Statistics (Destatis). Presentation: Weighting for Internet Quality Measurements from a Self-Selected Brazilian Public Schools Sample. In person, Wiesbaden, Germany. April 2024.

- 68th Brazilian Region Conference of the International Biometric Society. (RBras). Theme: Data Science, Statistics and Graduate Studies: Opportunities and Challenges. In person, São Paulo, Brazil. May 2025.
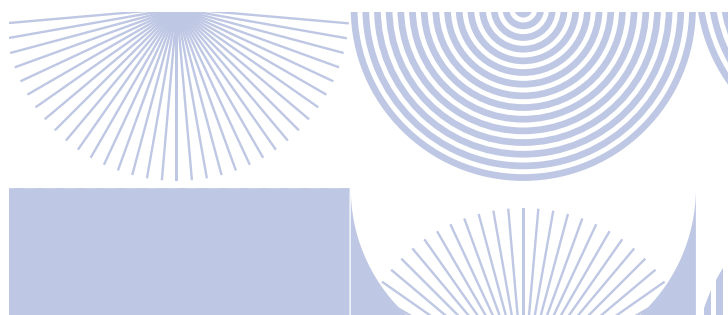
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