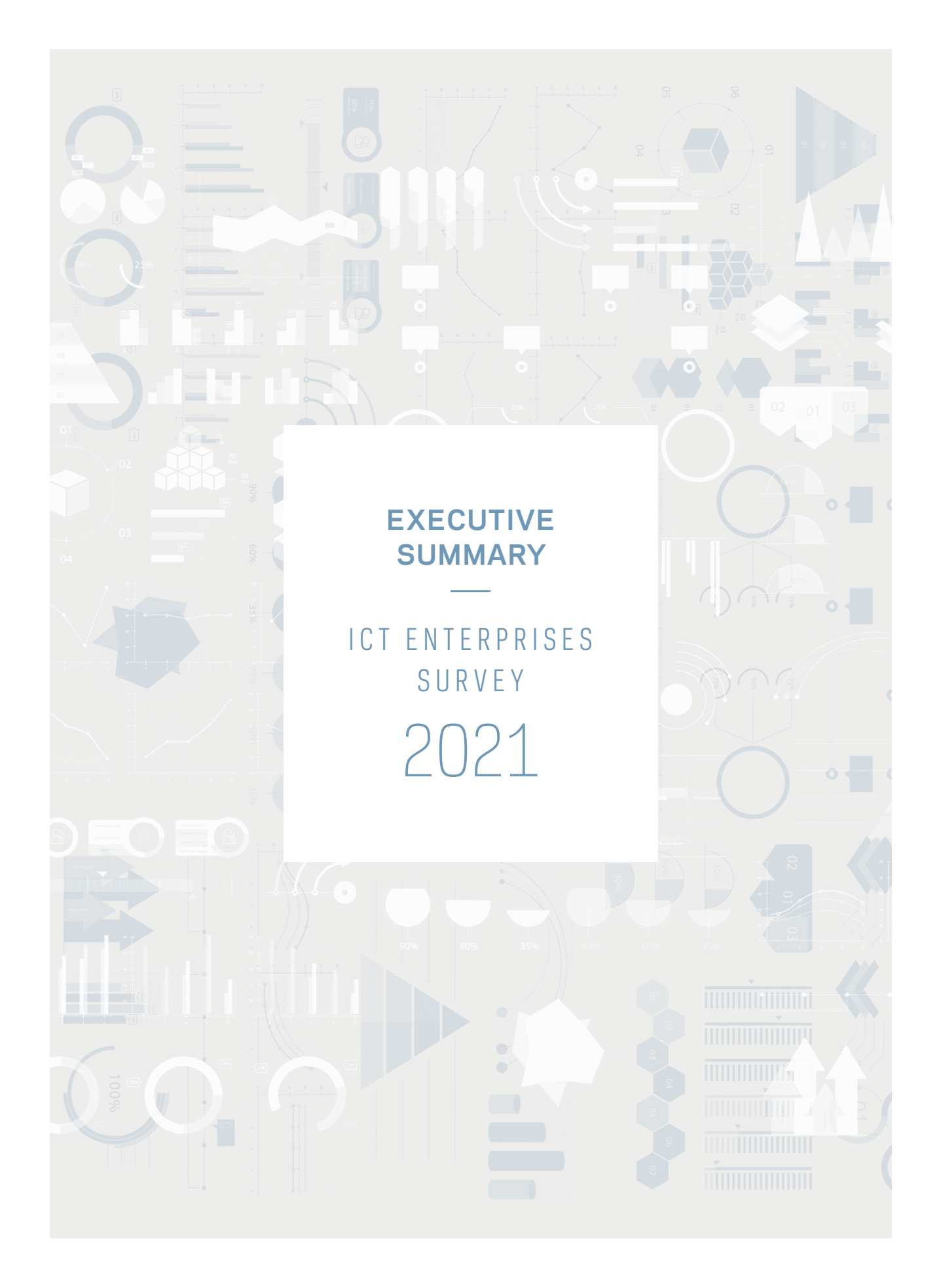




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— ICT ENTERPRISES SURVEY 2021

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Regional Center for Studies on the Development of the Information Society – Cetic.br

Executive and Editorial Coordination : Alexandre F. Barbosa

Survey Project Coordination : Fabio Senne (Coordinator), Ana Laura Martínez, Catarina Ianni Segatto, Daniela Costa, Fabio Storino, Luciana Portilho, Luísa Adib Dino, Luiza Carvalho and Manuela Maia Ribeiro

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ICT Enterprises Survey Coordination : Leonardo Melo Lins

Field Management : Ipec - Inteligência em Pesquisa e Consultoria: Alexandre Carvalho, Denise Alcântara, Regiane Sousa, Rosi Rosendo and Tais Magalhães

Editing support team : Comunicação NIC.br : Carolina Carvalho and Renato Soares

Proofreading and Revision in Portuguese : Oficina Editorial

Translation into English : Prioridade Consultoria Ltda.: Isabela Ayub, Lorna Simons, Luana Guedes, Luísa Caliri, Maya Bellomo Johnson and Melissa Barth

Graphic Design : Pilar Velloso

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Brazilian Internet Steering Committee - CGI.br

(in November, 2022)

Coordinator

José Gustavo Sampaio Gontijo

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Executive Summary

ICT Enterprises 2021

In its 14th edition, the ICT Enterprises 2021 survey offers an overview of the use of information and communication technologies (ICT) among Brazilian enterprises, showing changes in their operations due to the challenges brought about by the pandemic. The survey was conducted between August 2021 and April 2022, collecting data from Brazilian enterprises with 10 or more employed persons. The current edition of the survey deepens the investigation of the state of the digital economy in Brazil, measuring indicators that characterize the connectivity of enterprises, their online operations, and electronic commerce. In addition, the survey presents indicators on the use of advanced technologies, such as the Internet of Things (IoT) and Artificial Intelligence (AI), taking as a reference the standard developed by the Statistical Office of the European Union (Eurostat), which allows for comparing Brazil to economies with different degrees of complexity.

Connectivity

The ICT Enterprises 2021 survey indicated an increase of 20 percentage points in the proportion of enterprises with Internet access via fiber optic connection compared to 2019. While the other access technologies showed a decrease or stability, access through this type of connection among enterprises increased from 67% in 2019 to 87% in 2021. The increase was largely influenced by the advance of fiber optics in small enterprises, among which, in 2017, 46% accessed the Internet through this technology, reaching 86% in 2021. The other

access technologies showed little variation, indicating that fiber optics is consolidated as the main form of Internet access among Brazilian enterprises – a basic infrastructure attribute for businesses to qualify their performance with the use of digital technologies (Chart 1).

Electronic commerce

During the pandemic, electronic commerce emerged as an alternative for enterprises to maintain their activities in a time of restricted mobility. In terms of selling products and provision of services online, the ICT Enterprises 2021 survey showed that Brazil followed the trend of increasing online transactions observed in other countries. In 2019, 57% of Brazilian enterprises sold over the Internet, a proportion that rose to 73% in 2021, an increase largely

influenced by the growth of electronic commerce among small enterprises: In 2019, 57% of these enterprises sold over the Internet, a proportion that was 74% in 2021. The sectors in which online selling was not widespread showed growth in this edition of the survey: In 2019, 35% of enterprises in the construction sector carried out electronic commerce, a proportion that was 58% in

2021; in the transportation sector, the change was from 45% to 59%; finally, in the sector including professional activities, the change was from 44% to 57%. There was growth in Internet sales in all Brazilian regions, reflecting the need to adapt businesses to the pandemic context (Chart 2).

A peculiarity of e-commerce during the pandemic was the increased demand for direct

THE SURVEY
ESTIMATES
THAT 73,343
ENTERPRISES
IN BRAZIL USED
SMART DEVICES
OR THE INTERNET
OF THINGS

contact between enterprises and customers, because mobility restriction policies were implemented to reduce the spread of the virus. In this context, there was an increase in the use of instant messaging applications by Internet users to buy products and services, and a similar movement was strengthened among enterprises. Among those that sold over the Internet, in 2019, 42% sold products or services via WhatsApp, Skype or Facebook chat messages, a proportion that was 78% in 2021. This shows an effort by enterprises to contact customers during the pandemic and the consolidation of these means of conducting electronic commerce in the country. On the other hand, more traditional means of selling, such as the use of websites and presence on sales websites, were less cited by enterprises. In almost all sectors of the economy, in 2019, the use of instant messaging apps for selling did not reach half of the enterprises, a scenario that changed in 2021. More intensive use of messaging apps indicates not only a means to be in direct contact with customers, but may also represent an emergency form of digital presence, especially in small enterprises, as a possible response to the obstacles imposed by the pandemic (Chart 3).

New technologies

According to the ICT Enterprises 2021 survey, 14% of Brazilian enterprises used some type of smart or IoT device. In Europe, IoT use is led by Austria, with 51% of enterprises using some type of smart device, followed by Slovenia (49%). It is important to highlight that the use of IoT, in most countries, is more present in large enterprises, since they have greater capacity for development and investment in devices. In Brazil, this use was reported by 34% of large enterprises, with the highest proportion of use of these technologies in Austria, where 74%, of enterprises said they used some type of smart device.

THE SURVEY
ESTIMATES
THAT 65,707
ENTERPRISES
IN BRAZIL USED
ARTIFICIAL
INTELLIGENCE
TECHNOLOGIES

In Brazil, 13% of the enterprises stated that they used some type of AI application, with a predominance of large enterprises (39%). In comparison with European countries, Denmark is the country with the highest proportion of enterprises that used some type of AI (24%), also with a predominance of use among large enterprises. The results showed the incipient nature of AI adoption in all countries highlighted in this survey edition, indicating a development stage for most applications, which are still mostly projects that do not change the way enterprises operate (Chart 4).

Survey methodology and access to data

Carried out every two years, the ICT Enterprises survey maps the incorporation of ICT among Brazilian enterprises with 10 or more employed persons. The survey also investigates practices related to electronic

commerce, digital security, and the adoption of emerging technologies, covering several characteristics that make up the digital economy. Data collection for the 2021 edition, conducted by telephone, took place between August 2021 and April 2022. 4,064 enterprises were interviewed, providing results by size, geographic region, and economic sector. The results

of the ICT Enterprises 2021 survey, including the tables of proportions, total values, and margins of error, are available on the website of the Regional Center for Studies on the Development of the Information Society (Cetic.br) <https://www.cetic.br>. The “Methodological Report” and the “Data Collection Report” can be accessed in both the printed publication of the survey and on the website of Cetic.br|NIC.br.

CHART 1

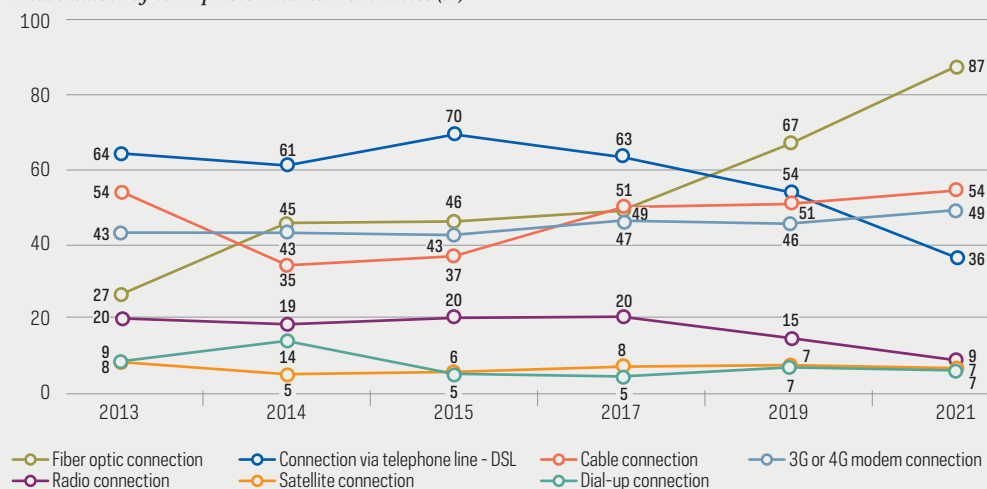
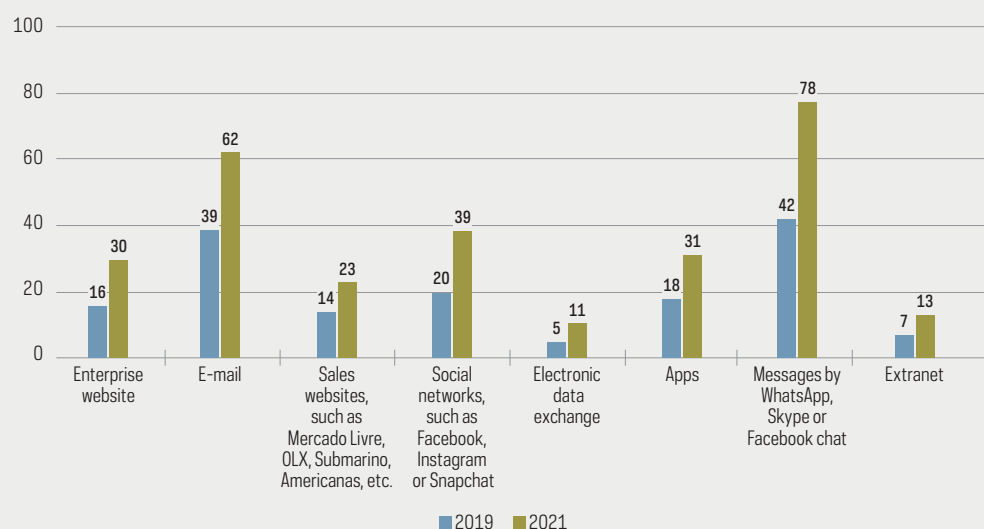
ENTERPRISES WITH INTERNET ACCESS, BY TYPE OF CONNECTION (2013 - 2021)*Total number of enterprises with Internet access (%)*

CHART 2

ENTERPRISES THAT SOLD ON THE INTERNET IN THE LAST 12 MONTHS, BY TYPE OF ONLINE MEDIA USED FOR TRANSACTIONS (2019 - 2021)*Total number of enterprises that sold on the Internet (%)*

Actions related to digital security

The ICT Enterprises survey investigates which practices enterprises undertake to reduce risks involving organizations' online exposure. There were no major changes in the practices most commonly undertaken by enterprises, with a greater prominence of meetings to discuss digital security, an item pointed out by 33% of enterprises in 2019 and 41% in 2021. Other actions aimed at strengthening processes that reduce risks, such as training and incentives, were cited less frequently. Therefore, it can be observed that more robust digital security practices were little present among enterprises. In addition, the subject was treated informally, which can lead to greater exposure to risk, increasing the chances of incidents that could cause irreversible financial and reputational damage.

54%

of enterprises had websites, whereas 87% had social network profiles or accounts

50%

of enterprises said they had digital security policies, with more prominence in medium and large enterprises

CHART 3

ENTERPRISES BY DIGITAL SECURITY PRACTICES (2019 - 2021)

Total number of enterprises with Internet access (%)

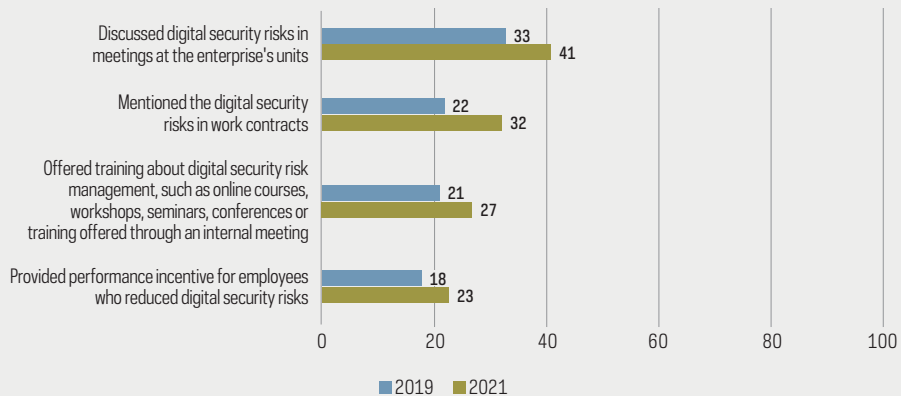


CHART 4

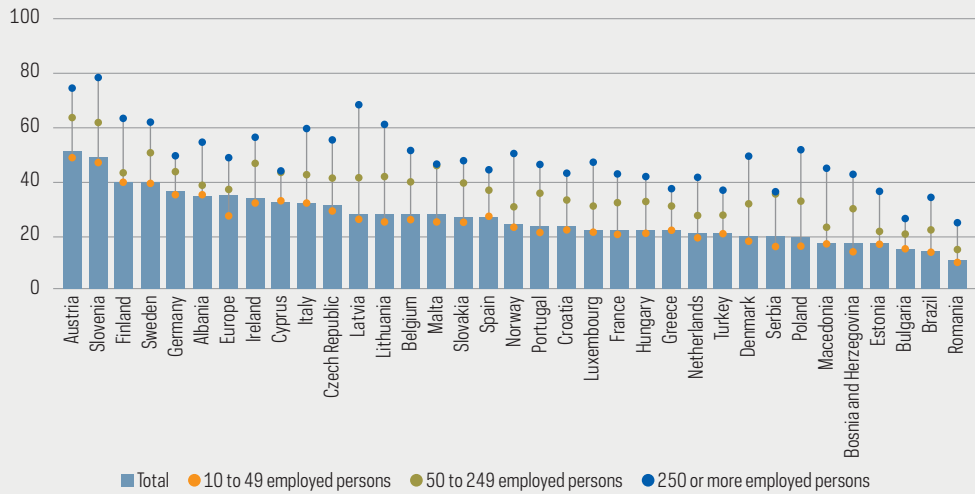
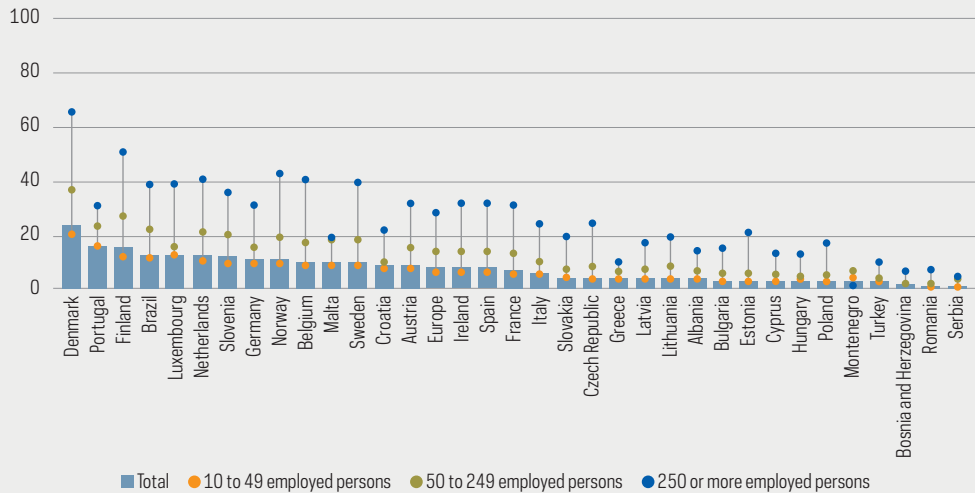
ENTERPRISES THAT USED SMART DEVICES OR IOT, BY COUNTRY AND SIZE (2021)*Total number of enterprises (%)*

CHART 5

ENTERPRISES THAT USED AI TECHNOLOGIES, BY COUNTRY AND SIZE (2021)*Total number of enterprises (%)*

ABOUT CETIC.br

cetic.br

The Regional Center for Studies on the Development of the Information Society, a department of NIC.br, is responsible for producing indicators and statistics on the access and use of the Internet in Brazil, disseminating analyzes and periodic information on the Internet development in the country. Cetic.br is a Regional Study Center, under the auspices of UNESCO. More information at <http://www.cetic.br/>.

ABOUT NIC.br

nic.br

The Brazilian Network Information Center – NIC.br (<http://www.nic.br/>) is a non-profit civil entity, which in addition to implementing the decisions and projects of the Brazilian Internet Steering Committee, has among its attributions: coordinate the registration of domain names – Registro.br (<http://www.registro.br/>), study, address and handle security incidents in Brazil – CERT.br (<http://www.cert.br/>), study and research network technologies and operations – CEPTRO.br (<http://www.ceptro.br/>), produce indicators on information and communication technologies – Cetic.br (<http://www.cetic.br/>), implement and operate Internet Exchange Points – IX.br (<http://ix.br/>), enable the participation of the Brazilian community in the global development of the Web and support the formulation of public policies – Ceweb.br (<http://www.ceweb.br/>), and host the Brazilian W3C office (<http://www.w3c.br/>).

ABOUT CGI.br

cgi.br

The Brazilian Internet Steering Committee, responsible for establishing strategic guidelines related to the use and development of the Internet in Brazil, coordinates and integrates all Internet service initiatives in the country, promoting technical quality, innovation and dissemination of the services offered. Based on the principles of multistakeholderism and transparency, CGI.br represents a democratic Internet governance model, internationally praised, in which all sectors of society participate equitable in the decision-making. One of its formulations is the 10 Principles for the Governance and Use of the Internet in Brazil (<http://www.cgi.br/principios>). More information at <http://www.cgi.br/>.



Access complete data from the survey

The full publication and survey results are available on the **Cetic.br** website, including the tables of proportions, totals and margins of error.

