FORTEC Innovation Survey

BASE YEAR

2023

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FORTEC Innovation Survey

Base year 2023

Intellectual Property and Technology Transfer, Entrepreneurship, and Partnership Policies and Activities of Brazilian Technology Innovation Centers

Annual Report of the FORTEC Innovation Survey – Base Year 2023

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INTRODUCTION

We are delighted to once again complete the compilation of data on Brazilian Technology Innovation Centers (NIT) through the FORTEC Innovation Survey. Now in its eighth edition, the survey has been instrumental in identifying the strengths and weaknesses of NIT, fostering activities that capitalize on their potential, and guiding actions to mitigate their shortcomings.

From an academic standpoint, the FORTEC Innovation Survey database has also facilitated research that deepens our understanding of NIT, providing crucial support for public policies and initiatives. Moreover, the Survey has garnered significant interest from government agencies, enhancing their comprehension of the vital role and importance of NIT within Scientific, Technological, and Innovation Institutions (ICT) and the broader impact of their activities.

The comprehensive data concerning the 130 Technology Innovation Centers, representing 146 participating ICT in this edition, is meticulously presented throughout the report. This data also empowers responding NIT to conduct their own self-assessments, and we extend our sincere gratitude for their participation once more. This recognition of the Survey's importance is a source of immense pride and satisfaction.

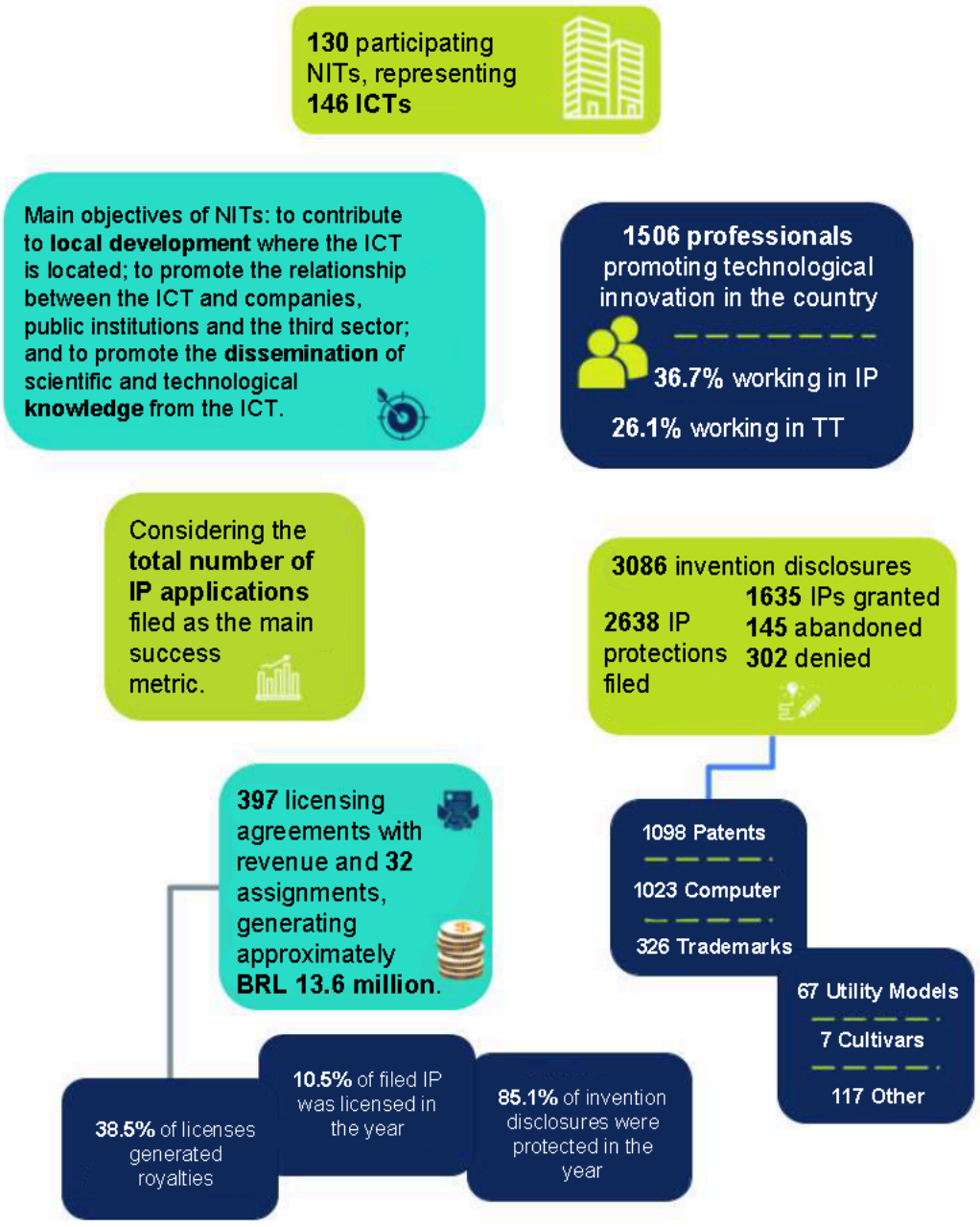
We extend our gratitude to the National Council for Scientific and Technological Development (CNPq) and the Rectorate of the Federal University of São Carlos (UFSCar), through its Innovation Agency (AIN), for their continued support in carrying out this activity for another year.

We also express special thanks to the entire board of directors, coordinators, and councils of FORTEC. Lastly, our heartfelt gratitude goes to the team (Debora, Samira, Patricia, and Tainá), whose unwavering diligence and commitment were instrumental in making this edition of the survey a success.

Thank you very much!

Ana Lúcia Vitale Torkomian
Vice-President of FORTEC and
Coordinator of the FORTEC Innovation Survey

INDICATORS 2023



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1.INTRODUCTION

This report aims to provide an overview of the efforts made by Brazilian Scientific, Technological, and Innovation Institutions (ICT) in activities related to intellectual property (IP) management, technology transfer (TT), collaborative projects, policy implementation, and ICT contributions to the innovation system, including entrepreneurship and partnerships, among other related topics, based on data collected by the FORTEC Innovation Survey. To achieve this, it presents a series of indicators related to the operational mode of Technology Innovation Centers (NIT) linked to these themes.

The results presented in this report are aggregated by responding Technology Innovation Center (NIT). This means that the NIT of an institution with multiple campuses will aggregate all IP protection and TT results from that ICT. Similarly, unless otherwise indicated, an NIT shared by several ICT will aggregate all results from these institutions.

The information provided by each NIT for the FORTEC Innovation Survey is the responsibility of each respondent. For the 2023 base year, marking the Survey's eighth edition, the number of respondents saw a decline, dropping from 152 to 130 —a figure notably close to the 2021 base year's 138 respondents. We interpret the oscillation in the total number of respondents as a natural phenomenon for any survey, particularly when considering the timing of this edition, conducted while technical-administrative staff and professors from several federal universities and institutes were on strike. Nevertheless, we emphasize that, even under these circumstances, many individuals remained willing to collaborate with the Survey. This fluctuation also arises from the inconsistent participation of certain NIT. This year, the 130 responding NIT are engaged with 146 ICT.

All 130 respondents, by participating, consented to share their information for the creation of the annual database; notably, only 1 chose not to include their institution in the list of participants for the FORTEC Innovation Survey's annual report, and 16 opted for the confidentiality of their ICT identification data within the database. The database aims to foster information exchange among participating NIT, facilitating the flow of knowledge and the learning of efficient practices for intellectual property protection, technology transfer, and initiatives stimulating entrepreneurship and innovation.

Consequently, FORTEC strongly encourages the non-confidentiality of ICT identification data, though the respondents' decision is always respected.

Following the example of successful global initiatives like the AUTM Licensing Survey and the HE-BCI Survey, the database for the 2023 fiscal year can be utilized by researchers and institutions for conducting studies. This holds the potential to generate crucial indicators and insights for proposing public and institutional policies that foster technological innovation derived from knowledge generated in Brazilian ICT, while also enhancing NIT activities and management.

1 Requests can be made directly via email to innovation@fortec.org.br.

2. GENERAL CHARACTERISTICS

For the 2023 base year, the eighth edition of the FORTEC Innovation Survey saw the participation of 146 ICT represented by the responses of 130 NIT. Among the respondents, as in previous years, there are NIT responsible for managing innovation for more than one ICT, either through specific arrangements or shared infrastructure

Regarding the characterization of the institutions mapped by the Survey, among the 130 responding NIT, 106 are public institutions; 22 are private institutions; 1 is community-based; and 1 is a private-law public institution, with these latter two categorized as “others”. By type, 83 identified as NIT from higher education institutions, 25 from professional and technological education institutes, 17 from research institutes, and 5 from other categories – these 'Other' respondents declared themselves as: 'Government School for Training and Qualification,' 'Federal Public Teaching Institution,' 'Teaching and Research Institution,' 'Teaching, Research, and Medicine Production Institution,' and 'University Hospital'.

The Southeast region, with 44 respondents, accounts for 33.8% of participants in the Survey, followed by the South with 30 respondents (23.1% of respondents) and the Northeast with 29 respondents (22.3% of participants). The North and Center-West regions accounted for 17 and 10 respondents, respectively (13.1% and 7.7% of participants). Figure 1 shows the distribution of respondents by region, while Table 1 summarizes the aforementioned information, and Chart 1 presents the institutions that authorized their identification in the list of participants, along with their acronyms and States.

Table 1 - Distribution of respondents by nature, type, and region of ICT

Region	Public	Private	Other
Central-West	**9**	**1**	**0**
Higher Education Institution	6	1	0
Research Institute	0	0	0
Professional and Technological Education Institute	3	0	0
Other	0	0	0
Northeast	**26**	**3**	**0**
Higher Education Institution	18	1	0
Research Institute	2	1	0
Professional and Technological Education Institute	5	1	0
Other	1	0	0
North	**14**	**3**	**0**
Higher Education Institution	8	1	0
Research Institute	2	2	0
Professional and Technological Education Institute	4	0	0
Other	0	0	0
Southeast	**39**	**5**	**0**
Higher Education Institution	21	4	0
Research Institute	8	1	0
Professional and Technological Education Institute	7	0	0
Other	3	0	0
South	**18**	**10**	**2**
Higher Education Institution	13	9	1
Research Institute	0	1	0
Professional and Technological Education Institute	5	0	0
Other	0	0	1

Figure 1 - Distribution of respondents by region

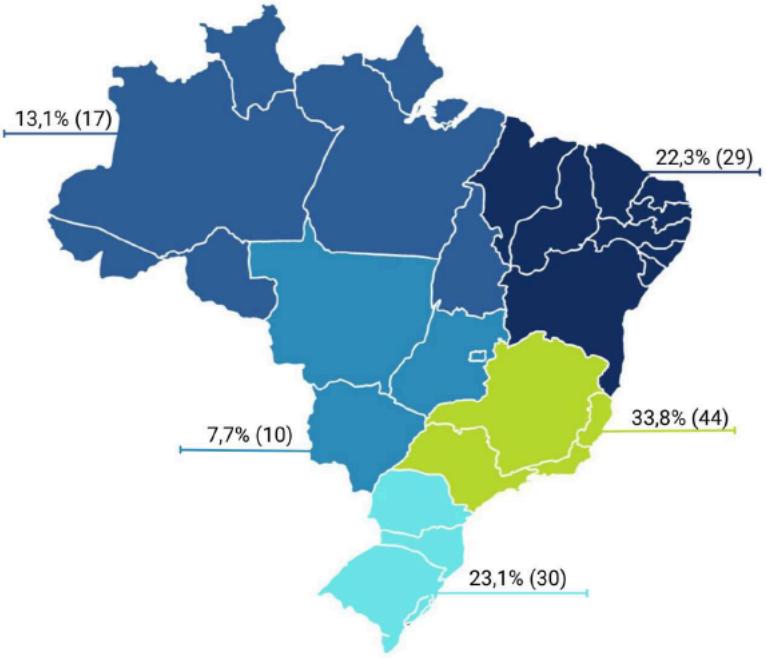


Table 1 – List of institutions participating in the FORTEC Innovation Survey, base year 2023

ICT	Acronym	State
Associação Pró-Ensino Superior em Novo Hamburgo	ASPEUR	RS
Centro de Tecnologia da Informação Renato Archer	CTI	SP
Centro Federal de Educação Tecnológica Celso Suckow da Fonseca	CEFET/RJ	RJ
Centro Nacional de Monitoramento e Alertas de Desastres Naturais	CEMADEN	SP
Centro Nacional de Pesquisa de Caprinos (Embrapa)	CNPC	CE
Centro Nacional de Pesquisa em Energia e Materiais	CNPEM	SP
Centro Universitário de Patos de Minas	UNIPAM	MG
Comissão Nacional de Energia Nuclear*	CNEN	RJ
Departamento de Ciência e Tecnologia Aeroespacial**	DCTA	SP
Escola Bahiana de Medicina e Saúde Pública	EBMSP	BA
Escola de Saúde Pública do Ceará	ESP/CE	CE
Fundação Desembargador Paulo Feitoza	FPFtech	AM
Fundação Ezequiel Dias	FUNED	MG
Fundação Oswaldo Cruz***	Fiocruz	RJ
Fundação Universidade Regional de Blumenau	FURB	SC
Hospital de Clínicas de Porto Alegre	HCPA	RS
Instituto Adolfo Lutz	IAL	SP
Instituto Capixaba de Pesquisa, Assistência Técnica e Extensão Rural	Incaper	ES
Instituto Centro de Ensino Tecnológico	Instituto CENTEC	CE
Instituto de Pesquisas Tecnológicas	IPT	SP

Instituto de Tecnologia e Pesquisa	ITP	SE
Instituto Evandro Chagas	IEC	PA
Instituto Federal Catarinense	IFC	SC
Instituto Federal da Paraíba	IFPB	PB
Instituto Federal de Alagoas	IFAL	AL
Instituto Federal de Ciência e Tecnologia do Amapá	IFAP	AP
Instituto Federal de Educação Ciência e Tecnologia do Espírito Santo	IFES	ES
Instituto Federal de Educação, Ciência e Tecnologia da Bahia	IFBA	BA
Instituto Federal de Educação, Ciência e Tecnologia de Minas Gerais	IFMG	MG
Instituto Federal de Educação, Ciência e Tecnologia de Pernambuco	IFPE	PE
Instituto Federal de Educação, Ciência e Tecnologia de São Paulo	IFSP	SP
Instituto Federal de Educação, Ciência e Tecnologia do Acre	IFAC	AC
Instituto Federal de Educação, Ciência e Tecnologia do Amazonas	IFAM	AM
Instituto Federal de Educação, Ciência e Tecnologia do Maranhão	IFMA	MA
Instituto Federal de Educação, Ciência e Tecnologia do Rio de Janeiro	IFRJ	RJ
Instituto Federal de Educação, Ciência e Tecnologia do Sudeste de Minas Gerais	IF Sudeste MG	MG
Instituto Federal de Educação, Ciência e Tecnologia do Sul de Minas Gerais	IFSULDEMINAS	MG
Instituto Federal de Educação, Ciência e Tecnologia do Triângulo Mineiro	IFTM	MG
Instituto Federal de Educação, Ciência e Tecnologia Goiano	IF Goiano	GO
Instituto Federal de Mato Grosso	IFMT	MT
Instituto Federal de Mato Grosso do Sul	IFMS	MS
Instituto Federal de Santa Catarina	IFSC	SC
Instituto Federal do Pará	IFPA	PA
Instituto Federal do Paraná	IFPR	PR
Instituto Federal Farroupilha	IFFar	RS
Instituto Federal Sul-Rio-Grandense	IFSul	RS
Instituto Nacional de Tecnologia	INT	RJ
Instituto Nacional de Telecomunicações	Inatel	MG
Instituto SENAI de Inovação em Tecnologias Minerais	ISI-TM	PA
Museu Paraense Emílio Goeldi	MPEG	PA
Núcleo de Tecnologia e Qualidade Industrial do Estado do Ceará	Nutec	CE
Pontifícia Universidade Católica do Rio de Janeiro	PUC-Rio	RJ
Pontifícia Universidade Católica do Rio Grande do Sul	PUCRS	RS
Serviço Nacional de Aprendizagem Industrial do Estado do Paraná	SENAI/PR	PR
Universidade Católica de Brasília	UCB	DF
Universidade Comunitária da Região de Chapecó	UNOCHAPECÓ	SC
Universidade da Integração Internacional da Lusofonia Afro-Brasileira	Unilab	CE
Universidade de Brasília	UnB	DF
Universidade de Cruz Alta	UNICRUZ	RS
Universidade de Passo Fundo	UPF	RS

Universidade de Pernambuco	UPE	PE
Universidade de Santa Cruz do Sul	UNISC	RS
Universidade de São Paulo	USP	SP
Universidade do Estado de Mato Grosso	UNEMAT	MT
Universidade do Estado de Minas Gerais	UEMG	MG
Universidade do Estado de Santa Catarina	UDESC	SC
Universidade do Estado do Pará	UEPA	PA
Universidade do Estado do Rio Grande do Norte	UERN	RN
Universidade do Vale do Itajaí	UNIVALI	SC
Universidade do Vale do Rio do Sinos	UNISINOS	RS
Universidade do Vale do Taquari	Univates	RS
Universidade Estadual de Campinas	Unicamp	SP
Universidade Estadual de Feira de Santana	UEFS	BA
Universidade Estadual de Londrina	UEL	PR
Universidade Estadual do Ceará	UECE	CE
Universidade Estadual do Centro Oeste	UNICENTRO	PR
Universidade Estadual do Maranhão	UEMA	MA
Universidade Estadual do Norte do Paraná	UENP	PR
Universidade Estadual do Norte Fluminense Darcy Ribeiro	UENF	RJ
Universidade Estadual do Oeste do Paraná	UNIOESTE	PR
Universidade Estadual do Rio Grande do Sul	UERGS	RS
Universidade Estadual do Sudoeste da Bahia	UESB	BA
Universidade Estadual do Tocantins	UNITINS	TO
Universidade Estadual Paulista "Júlio de Mesquita Filho"	Unesp	SP
Universidade Federal da Bahia	UFBA	BA
Universidade Federal da Fronteira Sul	UFFS	SC
Universidade Federal da Paraíba	UFPB	PB
Universidade Federal de Alagoas	UFAL	AL
Universidade Federal de Alfenas	UNIFAL-MG	MG
Universidade Federal de Campina Grande	UFCG	PB
Universidade Federal de Ciências da Saúde de Porto Alegre	UFCSPA	RS
Universidade Federal de Goiás	UFG	GO
Universidade Federal de Juiz de Fora	UFJF	MG
Universidade Federal de Lavras	UFLA	MG
Universidade Federal de Lavras - campus São Sebastião do Paraíso	UFLA/Paraíso	MG
Universidade Federal de Mato Grosso	UFMT	MT
Universidade Federal de Mato Grosso do Sul	UFMS	MS
Universidade Federal de Minas Gerais	UFMG	MG
Universidade Federal de Ouro Preto	UFOP	MG
Universidade Federal de Rondônia	UNIR	RO
Universidade Federal de Rondonópolis	UFR	MT

Universidade Federal de Santa Maria	UFSM	RS
Universidade Federal de São Carlos	UFSCar	SP
Universidade Federal de São Paulo	UNIFESP	SP
Universidade Federal de Sergipe	UFS	SE
Universidade Federal de Uberlândia	UFU	MG
Universidade Federal de Viçosa	UFV	MG
Universidade Federal do ABC	UFABC	SP
Universidade Federal do Amazonas	UFAM	AM
Universidade Federal do Ceará	UFC	CE
Universidade Federal do Espírito Santo	UFES	ES
Universidade Federal do Estado do Rio de Janeiro	UNIRIO	RJ
Universidade Federal do Oeste do Pará	UFOPA	PA
Universidade Federal do Pampa	Unipampa	RS
Universidade Federal do Pará	UFPA	PA
Universidade Federal do Paraná	UFPR	PR
Universidade Federal do Piauí	UFPI	PI
Universidade Federal do Recôncavo da Bahia	UFRB	BA
Universidade Federal do Rio de Janeiro	UFRJ	RJ
Universidade Federal do Sul e Sudeste do Pará	Unifesspa	PA
Universidade Federal do Tocantins / Universidade Federal do Norte do Tocantins	UFT/UFNT	TO
Universidade Federal do Vale do São Francisco	UNIVASF	PE
Universidade Federal dos Vales do Jequitinhonha e Mucuri	UFVJM	MG
Universidade Federal Rural de Pernambuco	UFRPE	PE
Universidade Federal Rural do Rio de Janeiro	UFRRJ	RJ
Universidade Federal Rural do Semi-Árido	UFERSA	RN
Universidade Franciscana	UFN	RS
Universidade Nilton Lins	UNL	AM
Universidade Presbiteriana Mackenzie	UPM	SP

* CNEN is a Federal Autarchy, an entity linked to the MCTI. CNEN's shared NIT, named the Innovation Management System (SGI), comprises the NIT of CNEN's technical-scientific units (UTCs): NIT-Sede, NIT-CDTN, NIT-IEN, NIT-IPEN, and NIT-IRD. The SGI also includes an innovation committee (IC) that discusses strategic themes and evaluates project results within the scope of ICT-company interaction. NIT-Sede functions as the NIT for ICT that do not have their own NIT (CRCN-NE, CRCN-CO, and LAPOC).

** The Department of Aerospace Science and Technology (DCTA - Departamento de Ciência e Tecnologia Aeroespacial) is a shared NIT linked to the Brazilian Air Force Command. It is responsible for IP and TT management activities of the research units: Aeronautical Technology Institute (ITA); Aeronautics and Space Institute (IAE); Institute for Advanced Studies (IEAV); Institute for Industrial Promotion and Coordination (IFI); Flight Research and Test Institute (IPEV); Alcântara Launch Center (CLA); Barreira do Inferno Launch Center (CLBI); Aeronautics Logistics Institute (ILA); Aeronautics Logistics Center (CELOG); São José dos Campos Aeronautics Computing Center (CCASJ); Aeronautics Chemical-Pharmaceutical Laboratory (LAQFA); Operational Applications Institute (IAOP); Brigadier Medical Roberto Teixeira Aerospace Medicine Institute (IMAE); and Airspace Control Institute (ICEA).

*** The Fiocruz Technology and Innovation Management System is a national-level NIT arrangement. It is responsible for coordinating IP and TT management activities of the following research units: Institute of Immunobiological Technology – Biomanguinhos; Laboratory Animal Breeding Center – CECAL; Sérgio Arouca National School of Public Health – ENSP; Joaquim Venâncio Polytechnic School of Health – EPSJV; Institute of Drug Technology – Farmanguinhos; Ageu Magalhães Research Center – CpqAM; Carlos Chagas Institute – ICC; Institute of Scientific and Technological Communication and Information in Health (RJ); Fernandes Figueira Institute; Gonçalo Moniz Research Center; Leônidas and Maria Deane Institute; National Institute for Quality Control in Health; Oswaldo Cruz Institute; Evandro Chagas Clinical Research Institute; Renee Rachou Research Center; Fiocruz Ceará; Fiocruz Rondônia; Fiocruz Mato Grosso do Sul; Oswaldo Cruz House; Center for Technological Development in Health; and Paraná Molecular Biology Institute – IBMP.

2.1 Respondents from 2017 to 2023

Since its second edition, in the 2017 base year, the FORTEC Survey has continued to be updated, while maintaining a similar questionnaire and question structure, enabling comparative analysis of various points present in the Survey. Throughout the report, some of these analyses will be presented.

Regarding the profile of respondents, concerning their nature, type, and region, Table 2 summarizes such information. With respect to type and nature, the majority continues to be higher education institutions and public institutions, with fluctuations in the other categories. In the analysis of respondents by region, the Southeast maintains the largest participation.

Table 2 - Profile of respondents by Survey base year

	2017	2018	2019	2020	2021	2022	2023
Total NIT	102	113	128	139	138	152	130
Total ICT	127	132	148	196	166	188	146
Public	79.4%	80.5%	75.8%	84.2%	84.8%	81.6%	81.5%
Private	18.6%	18.6%	18.8%	11.5%	12.3%	15.8%	16.9%
Other	2.0%	0.9%	5.5%	4.3%	2.9%	2.6%	1.5%
Higher Education	68.6%	68.1%	69.5%	64.0%	65.9%	61.2%	63.9%
Research Institute	14.7%	8.8%	7.8%	11.5%	10.1%	11.8%	13.0%
Professional and Technological Education Institute	16.7%	21.2%	18.8%	20.9%	21.0%	20.4%	19.2%
Other	0.0%	1.8%	3.9%	3.6%	2.9%	6.6%	3.8%
Central-West	5.9%	8.8%	8.6%	10.1%	8.0%	9.2%	7.7%
Northeast	25.5%	19.5%	18.0%	19.4%	21.0%	20.4%	22.3%
North	6.9%	7.1%	6.3%	10.8%	13.0%	11.8%	13.1%
Southeast	36.3%	35.4%	33.6%	33.8%	33.3%	35.5%	33.8%
South	25.5%	29.2%	33.6%	28.1%	24.6%	23.0%	23.1%

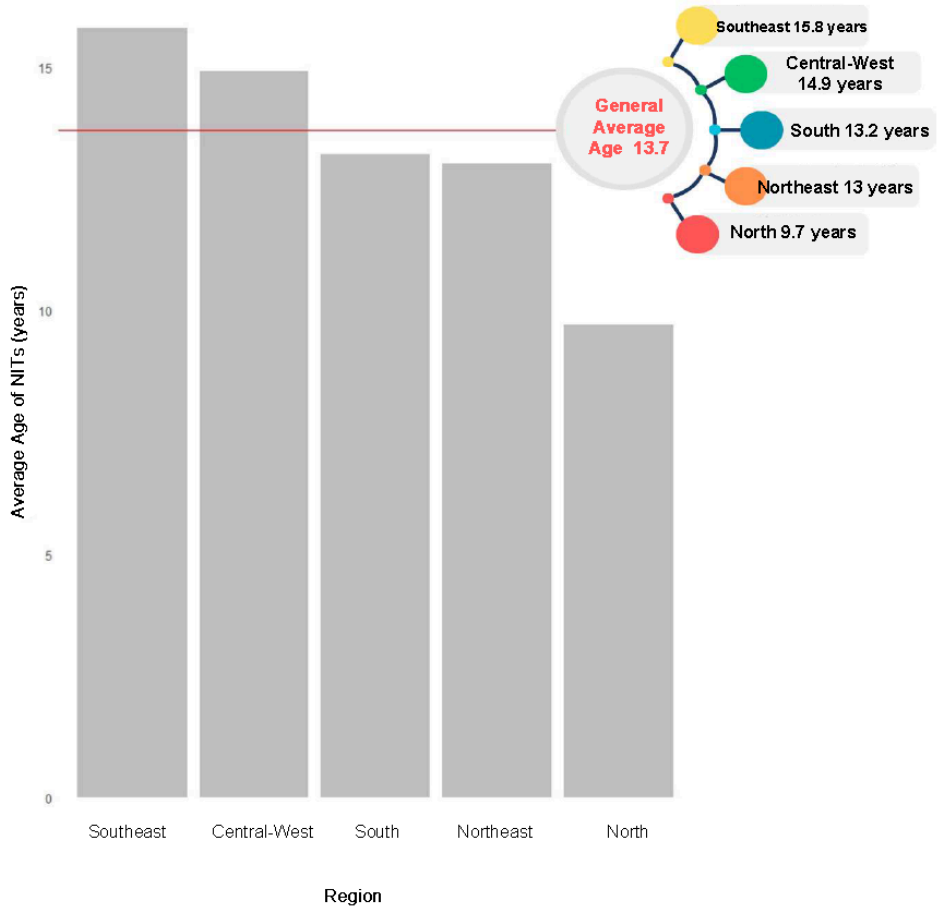
3. TECHNOLOGY INNOVATION CENTERS

3.1 Implementation and initiation of activities

The implementation process of NIT involves a series of activities, ranging from the initiation of intellectual property protection activities to the institutionalization of the NIT as part of the ICT's organizational chart. In this regard, the Survey collected information on the stage of implementation, the age of the NIT, and the year of initiation of IP activities. These two pieces of information - age, according to the year of creation, and initiation of activities, considering the first year in which the ICT dedicated at least one professional (even if partially) to intellectual property protection (IPP) activities - may differ, thus indicating whether the NIT's creation was prior to, concurrent with, or subsequent to the initiation of IPP activities

Among the respondents, 83 initiated IPP activities concurrently with the NIT's creation, while 33 began activities before institutional creation, and 14 only started operating after being formally established. These cases, where activities began only one or two years after the NIT's creation, can occur when the NIT is established without any existing regulations for IP protection-related activities, or when it is created within a pre-existing structure responsible for activities such as university-industry partnership agreements, business incubation, among others. Regarding ages, calculated from the year of creation up to the 2023 base year, responses ranged from 0 to 42 years, with an average of 13.7 years. Graph 1 provides an overview of the average ages of NIT across different regions of Brazil.

Graph 1 - Average age of responding NIT by region



The overall average age of responding NIT is 13.7 years, with the Southeast (15.8 years) and Center-West (14.9 years) regions exceeding this average. The remaining regions fell below the general average.

Regarding the implementation stage, 128 (98.5%) survey participants stated they were implemented, while 2 (1.5%) reported being in implementation. Furthermore, concerning the NIT's presence within the ICT's organizational structure, only one NIT reported having a distinct legal personality from its originating ICT, while three others indicated initiating a formal process with this objective. Among the 130 NIT, 69 reported having a cooperation agreement or covenant signed with private non-profit entities, such as support foundations.

3.2 NIT's Affiliation within the ICT

In the 2022 reference year, a question was incorporated to identify the NIT's position within the broader ICT context, aiming for a clearer understanding of its

guidelines and operations.

As ICT present diverse organizational arrangements with similar purposes, responses with affinities were grouped, such as those related to Pro-Rectorates of Research and Graduate Studies. In these cases, responses indicating affiliation with the respective Pro-Rectorate, either directly or through a specific internal department, were grouped. Similarly, Rectorates, Presidencies, and General Directorates were grouped, understanding the similarity of their positions across different organizational types. These groupings aim to facilitate and standardize the diversity of responses, to understand which areas of ICT the NIT are affiliated with. The results are presented in Table 3.

Table 3 - Location of the NIT in the ICT's organizational chart

Area	Quantity	%
Rectorate / Presidency / General Directorate	46	35.4%
Pro-Rectorate of Research, Graduate Studies, and Innovation	31	23.8%
Pro-Rectorate of Research and/or Graduate Studies	25	19.2%
Directorate of Research and Development, Innovation, and/or Entrepreneurship	11	8.5%
Division of Technological Innovation	6	4.6%
Pro-Rectorate of Innovation	5	3.8%
Planning Coordination	2	1.5%
Vice-Rectorate of Development and Innovation	1	0.8%
Directorate of Extension	1	0.8%
Directorate of Teaching and Research	1	0.8%
Head of Technology Transfer	1	0.8%

It is observed that 35.4% of NIT are directly associated with senior management, whether the Rectorate, General Directorate, or Presidency of the ICT, while 19.2% are linked to Pro-Rectorates of Research and Graduate Studies. Pro-Rectorates that encompass the area of innovation along with Research and/or Graduate Studies account for 23.8%, while 5 NIT (3.8%) are specifically part of Innovation Pro-Rectorates. Furthermore, 8.5% are part of Directorates related to R&D and/or Research, Innovation, and Entrepreneurship. These sectors can be considered similar

to the aforementioned Pro-Rectorates, but the decision was made to maintain the separation, as the hierarchy of these Directorates within the organization is not always clear.

The remaining responses, with one or two occurrences, point to other areas such as Extension, Planning, Vice-Rectorate of Development and Innovation, and even a Head of TT. Thus, a diversity of arrangements is observed, but with a predominance of higher-level instances related to research and innovation.

Highlighting the 5 NIT whose ICT specifically have an Innovation Pro-Rectorate, all are public, federal ICT, with 3 being Higher Education Institutions and 1 being a Professional and Technological Education Institute. Two of these NIT belong to the same ICT, which has different autonomous NIT on each campus. Of the 4 ICT, 2 are from the Southeast region, one from the North, and one from the South.

3.3 Staff

One of the key themes of the FORTEC Survey since its inception has been the composition of NIT staff, aiming to map both their profiles and the activities developed, thus enabling an understanding of the dedication of the workforce within NIT and their structure

3.3.1 Function and employment type

A primary inquiry concerns the number of active staff within NIT. In 2023, a total of 914 professionals with exclusive dedication (an average of 7 per Center) and 592 professionals with partial dedication (an average of 4.6 per Center) were reported. The median values were 3.0 for collaborators with exclusive dedication and 2.0 for those with partial dedication. It is worth noting that the average values reported above are influenced by a few NIT that concentrate a high number of employees.

Considering that 1 collaborator with partial dedication can be computed as 0.5 full-time equivalent collaborator, the average number of full-time equivalent professionals per NIT (or FTE) becomes 9.3, while the median is 4.5.

Graph 2 presents a comparison between the averages and medians of the number of NIT professionals in FTE according to the function performed.

Graph 2 - NIT professionals by employment type [average and median in FTE]

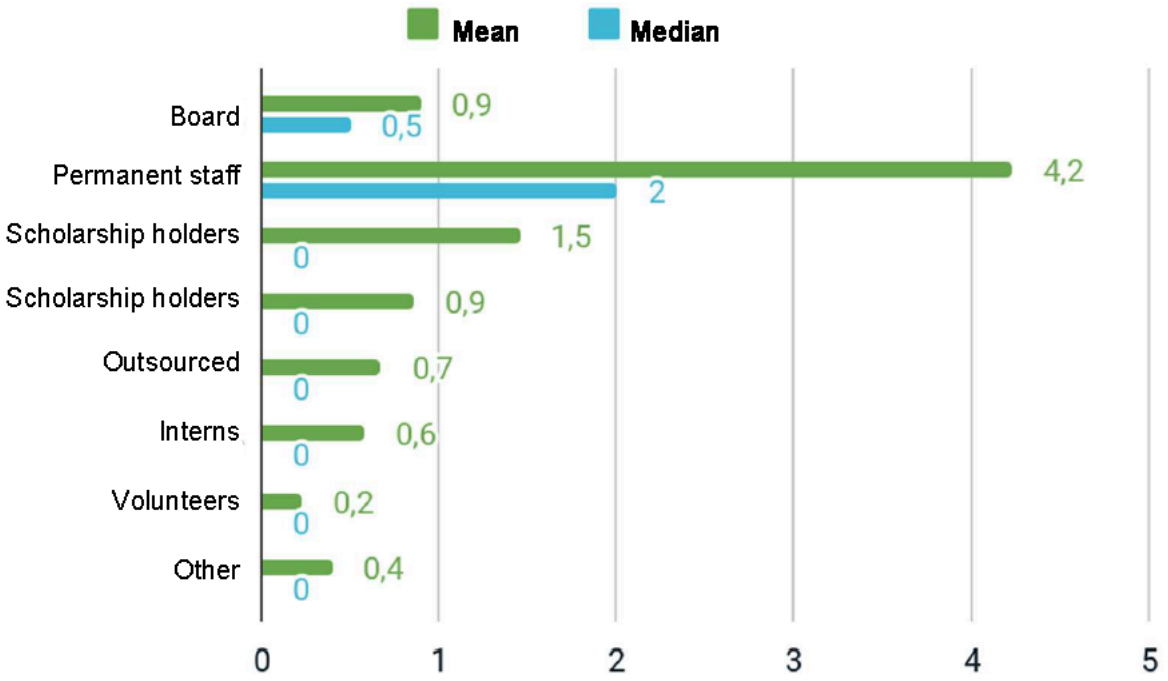


Table 4 summarizes data related to the NIT staff by function performed and employment type, with their respective averages and medians.

Table 4 - NIT employees by function performed

	Exclusive Dedication		Partial Dedication		FTE*	
Function at NIT	Average	Median	Average	Median	Average	Median
Board	0.5	0.0	0.8	1.0	0.9	0.5
Permanent staff	3.6	1.0	1.3	0.0	4.2	2.0
Graduate scholarship holders	1.3	0.0	0.4	0.0	1.5	0.0
Undergraduate scholarship holders	0.3	0.0	1.0	0.0	0.9	0.0
Outsourced	0.6	0.0	0.1	0.0	0.7	0.0
Interns	0.4	0.0	0.4	0.0	0.6	0.0
Volunteers	0.0	0.0	0.4	0.0	0.2	0.0
Other	0.3	0.0	0.4	0.0	0.4	0.0
Total	**7.0**	**3.0**	**4.6**	**2.0**	**9.3**	**4.5**

* The "full-time equivalent (FTE) collaborators" column was calculated considering the following relationship: FTE = (number of exclusive dedication collaborators) + 0.5x (number of partial dedication collaborators).

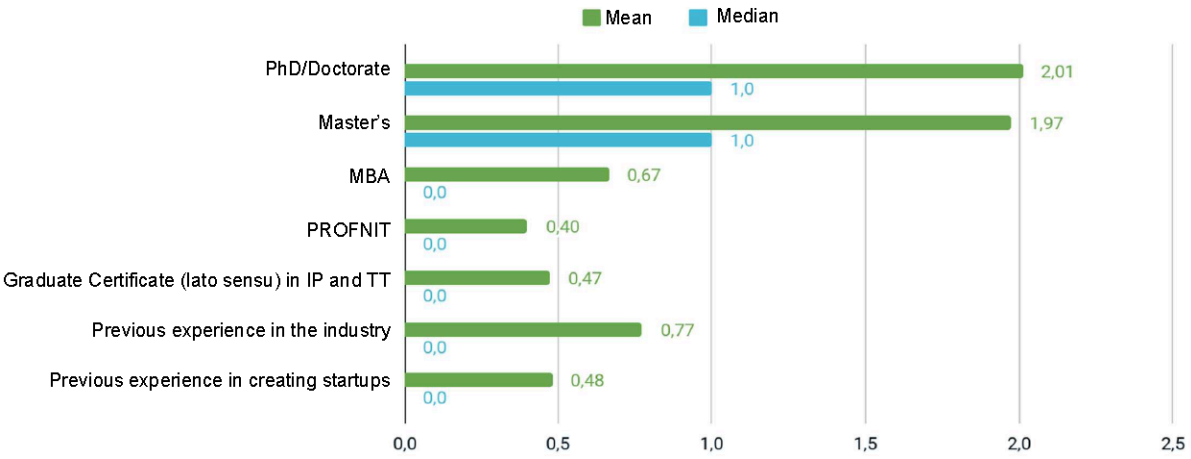
3.3.2. Education level and area of study

Regarding the education level of collaborators, the following paragraphs separate the results by employment type (exclusive or partial dedication), as each group exhibits distinct characteristics in this topic.

Among collaborators with exclusive dedication working in the surveyed NIT, 22.4% held doctorates (average of 1.1 per NIT); 32.5% had master's degrees (average of 1.6 per NIT); 10.7% had MBAs (average of 0.5 per NIT); 7.8% possessed lato sensu graduate degrees in IP or TT-related topics (average of 0.4 per NIT); 7.0% had completed PROFNIT (average of 0.4 per NIT); 18.0% had previous industry experience (average of 0.6 per NIT); and 10.1% had previous experience in startup creation (average of 0.4 per NIT).

Conversely, among professionals with partial dedication, it was observed that 50.7% held doctorates (average of 1.8 per NIT); 19.5% had master's degrees (average of 0.7 per NIT); 7.2% had MBAs (average of 0.3 per NIT); 2.6% had completed PROFNIT (average of 0.1 per NIT); 4.6% possessed lato sensu graduate degrees in IP or TT-related topics (average of 0.2 per NIT); 8.1% had previous industry experience (average of 0.3 per NIT); and 7.2% had previous experience in startup creation (average of 0.3 per NIT).

Graph 3 - Professionals by education level or experience [average and median in FTE]



Among the areas of study of professionals working in NIT, it was observed that, in terms of FTE, the average for administrators and economists was 2.3 per NIT (25.0% of the total FTE), a figure close to that of engineers, physicists, chemists, mathematicians,

and

computer scientists, at 2.1 (22.6% of the total FTE); professionals with a legal background averaged 1.2 per NIT (13.3% of the total FTE), close to those in biological and medical sciences, with an average of 1.1 (11.2% of the total FTE).

The average for social communication professionals was 0.6 per NIT (6.4% of the total FTE); and for other educational backgrounds, it was 2 per NIT (21.5% of the total FTE). Graph 4 provides a comparison between the averages and medians of professionals in NIT by FTE according to their educational background, with details presented in Table 5.

Graph 4 - NIT professionals by area of education [average and median per FTE]

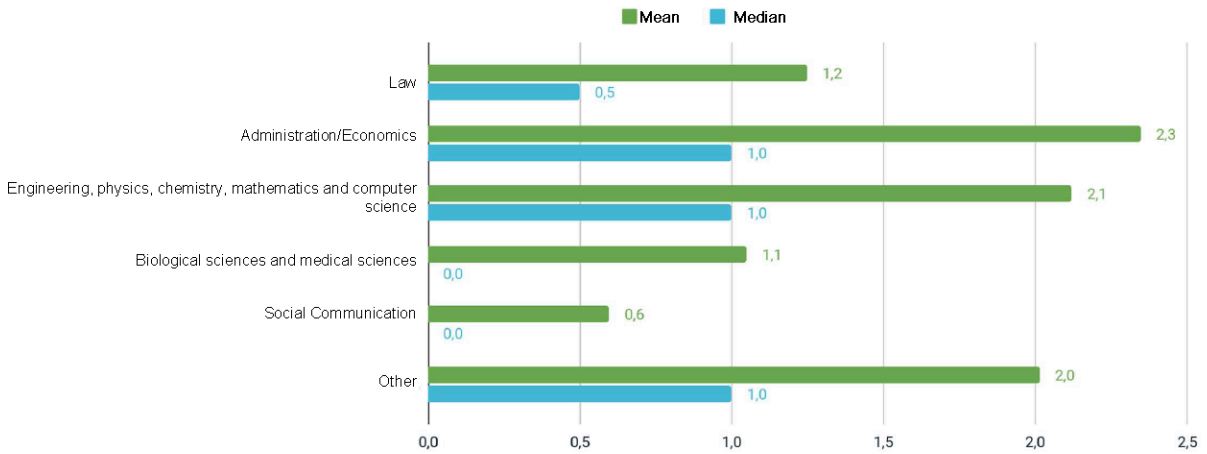


Table 5 - Surveyed NIT professionals by area of education

	Exclusive Dedication		Partial Dedication		FTE*	
Area of Education	**Average**	**%**	**Average**	**%**	**Average**	**%**
Law	1.0	14.5%	0.4	9.8%	1.2	13.3%
Administration, Economics	2.0	27.7%	0.8	16.6%	2.3	25.0%
Engineering, physics, chemistry, mathematics and computer science	1.3	17.9%	1.7	37.3%	2.1	22.6%
Biological sciences and medical sciences	0.7	9.9%	0.7	15.4%	1.1	11.2%
Social Communication	0.5	6.6%	0.3	5.7%	0.6	6.4%
Other	1.7	23.5%	0.7	15.2%	2.0	21.5%

* The "full-time equivalent (FTE) collaborators" column was calculated considering the following

relationship: FTE = (number of exclusive dedication collaborators) + 0.5x (number of partial dedication collaborators).

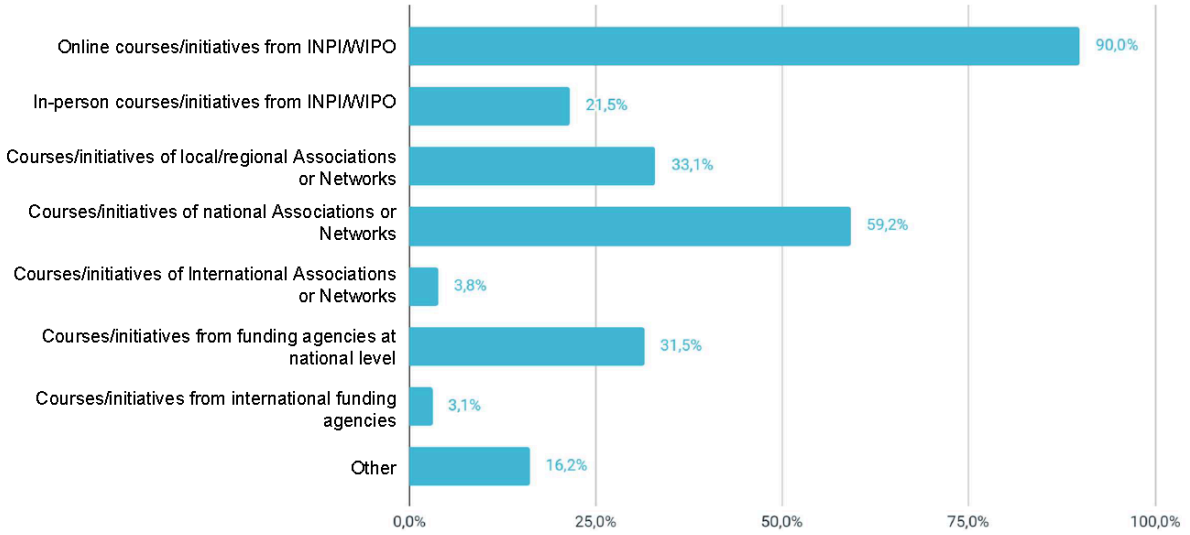
3.3.3. Complementary Education

Regarding the involvement of the surveyed NIT in training and capacity building programs, 3 (2.3%) stated they had not participated in initiatives for the development of their collaborators' intellectual property management, marketing, and/or negotiation skills. Among the others, 117 (90.0%) respondents participated in online courses offered by INPI (National Institute of Industrial Property) or WIPO (World Intellectual Property Organization), while 28 (21.5%) participated in in-person courses from the same institutions.

Regarding training offered by associations or networks, 77 (59.2%) respondents participated in courses/initiatives from national-level associations or networks (FORTEC, ANPEI, ANPROTEC, among others); 43 (33.1%) participated in courses/initiatives from local/regional associations or networks; and 5 (3.8%) participated in courses/initiatives from international associations or networks, such as AUTM, PraxisAuril, and others. National entities, in addition to operationalizing workshops in cooperation with bodies such as INPI, WIPO, and LES Brazil (Brazilian Association of Licensing Executives), offer their own training programs for NIT collaborators, such as FORTEC's PROFNIT, as well as organizing thematic events and conferences in the area of IP and TT management.

Among the respondents, 41 (31.5%) participated in state and national-level initiatives from funding agencies (CNPq, FAP, among others) aiming at the development of NIT human resources and processes; 4 (3.1%) participated in international-level initiatives offered by funding agencies for research promotion; and 21 (16.2%) indicated having participated in other types of training not mentioned above. Graph 5 summarizes the information.

Graph 5 - Percentage of NIT that participated in the following types of training

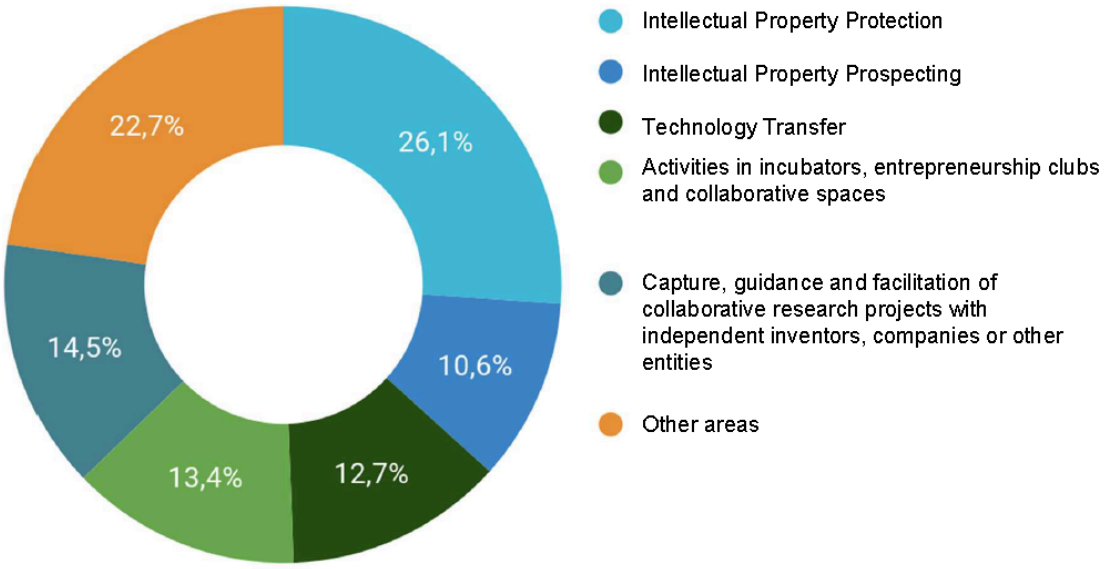


3.4. Activities developed

3.4.1 Internal activities

In addition to the employment type and educational background of professionals, the Survey inquires about the areas of activity of NIT collaborators, among the main activities that are part of a NIT's scope of work. It was verified that, in descending order of time spent, intellectual property protection activities ranked first, occupying 26.1% of the total working time, followed by general activities such as management, coordination, administrative tasks, secretarial work, and others, at 22.7%; capture, guidance, and viability of collaborative research projects, at 14.5%; activities in incubators, entrepreneurship clubs, and collaborative spaces, at 13.4%; technology transfer activities, at 12.7%; and finally, intellectual property prospecting activities, at 10.6%. This information is summarized in Graph 6.

Graph 6 - NIT professionals by area of activity [%]



Considering protection and prospecting activities as inherent to IP management, and technology transfer activities, work in incubators, entrepreneurship clubs, and collaborative spaces as inherent to the technology transfer area, it is observed that 36.7% of NIT human resources worked with IP and 26.1% with TT in 2023. Table 6 presents comparative data for each year the survey was conducted.

Table 6 - Area of activity by survey base year

	2017	2018	2019	2020	2021	2022	2023
IP Prospecting	12.6%	12.9%	11.1%	11.2%	12.9%	10.3%	10.6%
IP Protection	32.6%	31.9%	31.4%	29.2%	19.6%	28.3%	26.1%
Total PI	**45.2%**	**44.8%**	**42.5%**	**40.4%**	**32.5%**	**28.7%**	**36.7%**
Technology Transfer	14.8%	14.3%	12.6%	12.8%	16.6%	11.6%	12.7%
Activities in incubators etc.	13.0%	14.7%	12.7%	13.7%	13.7%	12.3%	13.4%
Total TT	**27.8%**	**29.0%**	**37.4%**	**36.5%**	**43.7%**	**23.9%**	**26.1%**
Collaborative research	-%*	-%*	12.1%	10.0%	13.4%	15.3%	14.5%
Internal activities	26.9%	25.4%	20.1%	22.2%	23.8%	22.1%	22.7%

*The area of collaborative research was not included among the activities in the 2017 and 2018 base year surveys.

3.5 Outsourced activities

Among the activities necessary for intellectual property management and technology transfer processes, some are outsourced by NIT to enhance and optimize their actions. Of the Survey respondents in the 2023 base year, 49.2% (64) performed some type of outsourcing, while the other 50.8% carried out the listed activities solely with their internal workforce capacity. Of the latter, 13.1% (17) had active licensing agreements, and their average age was 13.2 years.

For the existing activities, two groups were separated according to their respective types: intellectual property (IP) management and technology transfer (TT). Based on the responses obtained, it is observed that the average age of NIT that outsourced IP-related activities is similar to that of those that outsourced TT activities, being 13.9 for the first group and 13.2 for the second. Furthermore, within this division, among respondents who outsourced IP activities, 18.5% indicated having active licensing agreements, a much lower number in the second group, at 6.2%.

Regarding the activities themselves, those related to IP processes most frequently outsourced, in descending order, were: drafting national patents, at 36.2%; prior art searches, at 28.5%; drafting international patents, at 23.1%; filing and monitoring patents in Brazil and filing and monitoring patents abroad via PCT, both at 20.8%; filing and monitoring patents abroad in the national phase, at 18.5%; and legal advice for representation in eventual lawsuits, at 9.2%.

As for activities related to TT processes, the most frequently outsourced, in descending order, were technology valuation and market potential analysis, at 13.8%; assistance in negotiating licensing agreements, at 6.2%; assistance in searching for potential licensees, assistance in drafting licensing agreements, and consulting for developing marketing and commercialization strategies, all three at 5.4%. Graph 7, below, refers to the presented data, showing the types of IP management activities outsourced by the surveyed NIT, while Graph 8 does the same for TT activities.

Gráfico 7 - Principais serviços terceirizados pelos NIT para a gestão de PI [%]

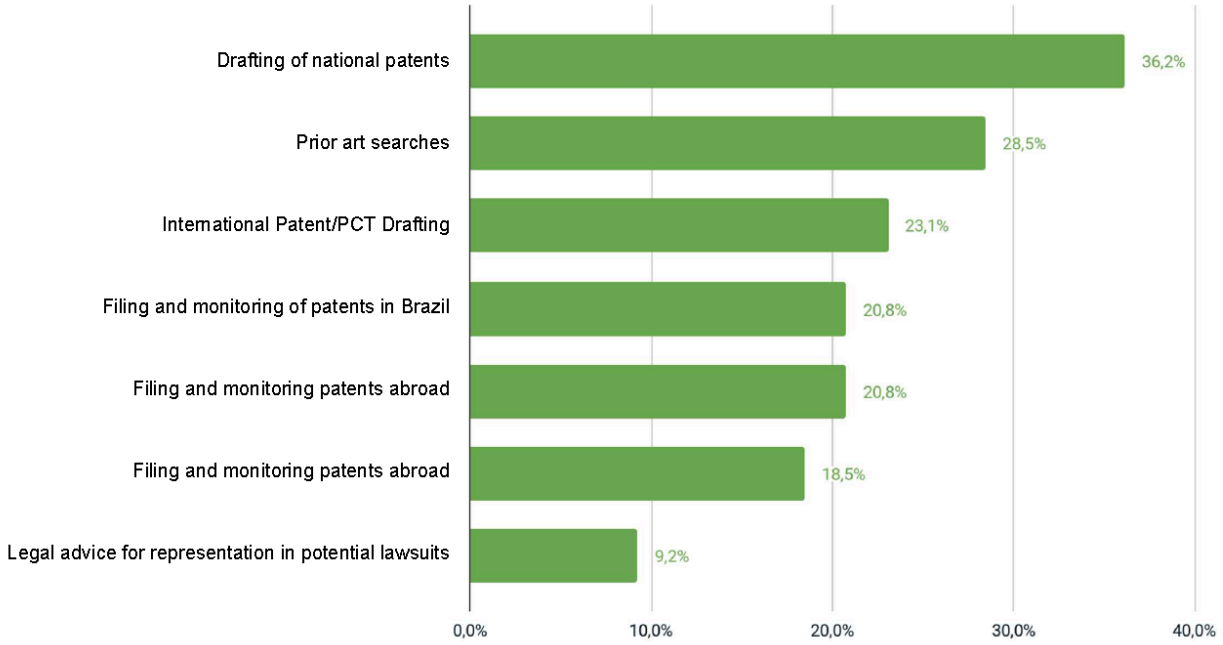
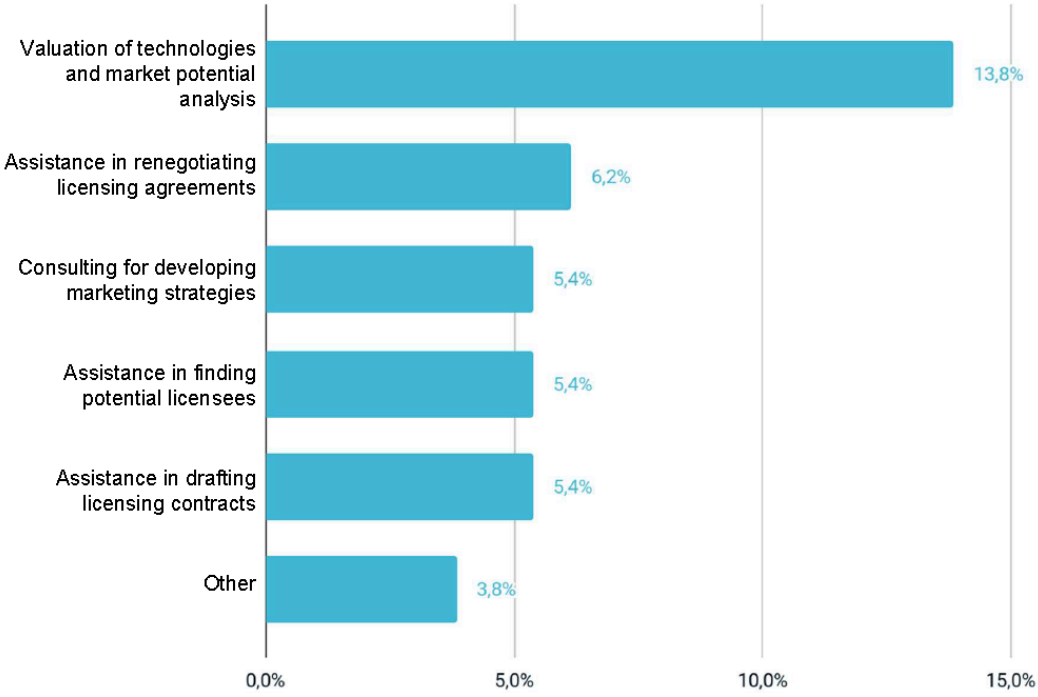


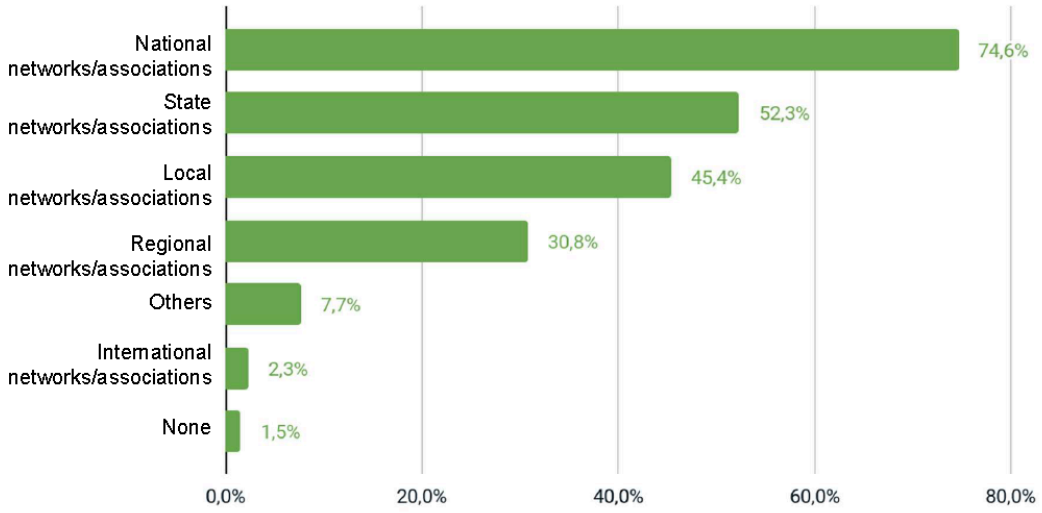
Gráfico 8 - Principais serviços terceirizados pelos NIT para a transferência de tecnologia por meio de licenciamentos [%]



3.6. Participation in associations or networks

Among the 130 respondents, it was observed that 128 participate in associations or networks. In descending order, 74.6% (97) participate in national-level networks/associations; 52.3% (68) in state-level networks/associations; 45.4% (59) in local networks/associations; 30.8% (40) in regional networks/associations; 7.7% (10) in other networks; and 2.3% (3) in international networks. Graph 9 summarizes this information.

Graph 9 - Percentage of NIT that participated in the following types of networks/associations



3.7 Definitions of strategy and performance

Regarding NITs' activities, the FORTEC Survey also investigates the existence of strategic definitions, both internally and in relation to the ICT, as well as objectives and metrics that guide their actions and results.

As a result, it was identified that 80% (104) of respondents have an internal strategic plan, and 93.8% (122) of NIT are integrated into the ICT's planning and management instrument.

To better understand NITs' strategic priorities, participants rated the importance of potential strategic objectives on a 5-point scale, where 1 means slightly important; 2, relatively important; 3, important; 4, very important; and 5, extremely important.

The objectives "to contribute to the local and regional development of the environment in which the ICT is inserted," "to promote the relationship between the ICT and companies, public institutions, and the third sector," and "to promote the dissemination of scientific and technological knowledge from the ICT" were classified as the most important, all with an average importance of 4.4 points. These were followed by "to provide service to the ICT's own inventors/researchers," with 4.3 points, and "to facilitate the practical application of inventions originating from research," with 4.1 points.

With an average importance of 3.9, the objective was "to generate revenue through collaborative research agreements between the ICT and companies". This was followed by "to prospect technologies to guide the ICT's innovation actions," with 3.8 points; "to generate revenue through licensing agreements," with 3.7 points; and "to assist in the creation of spin-off companies," with 3.6 points.

The last two objectives were "to provide services to other ICT, companies, public institutions, and the third sector," with an average of 3.2 points, and "to provide service to independent inventors/researchers," with an average of 2.9 points.

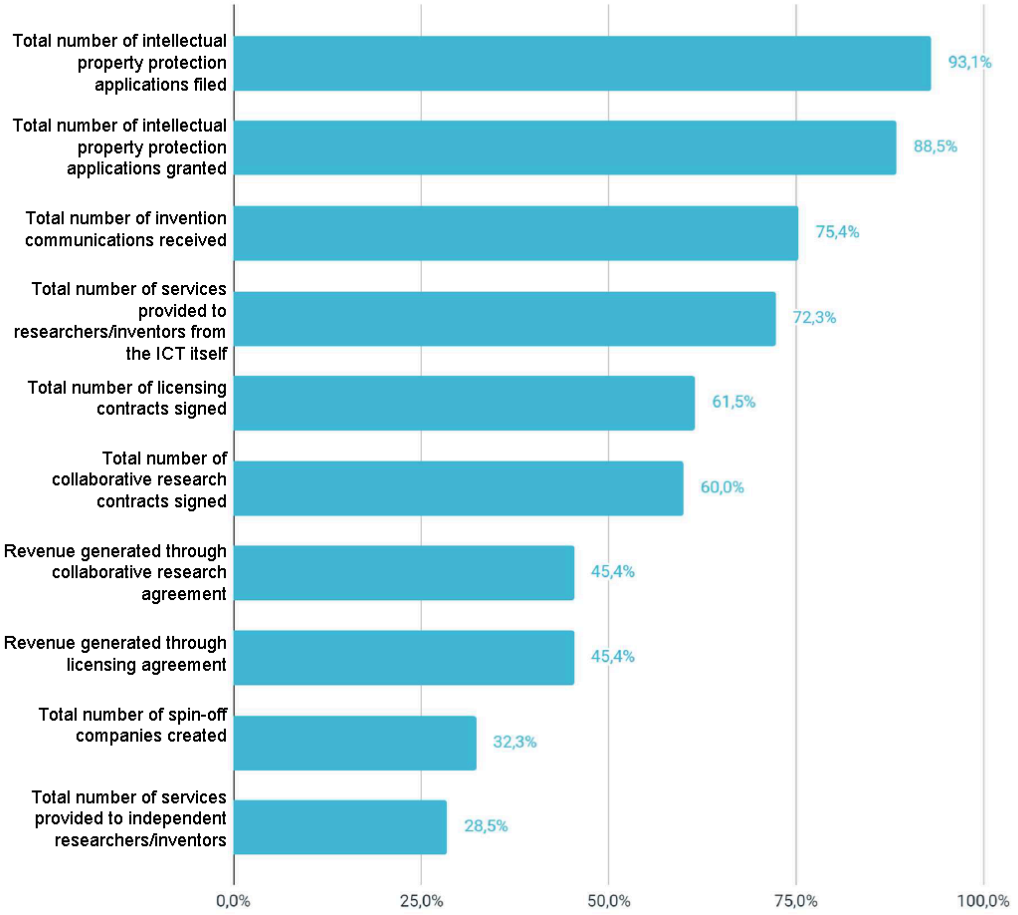
Table 7 provides an overview of the importance of strategic objectives for the NIT surveyed in 2022.

Table 7 - Importance of NITs' strategic objectives

Strategic objective	Average importance score
Contribute to the local and regional development of the environment in which the ICT is inserted	4.4
Promote the relationship between the ICT and companies, public institutions, and the third sector	4.4
Promote the dissemination of scientific and technological knowledge from the ICT	4.4
Provide service to the ICT's own inventors/researchers	4.3
Facilitate the practical application of inventions originating from research	4.1
Generate revenue through collaborative research agreements between the ICT and companies	3.9
Prospect technologies to guide the ICT's innovation actions	3.8
Generate revenue through licensing agreements	3.7
Assist in the creation of spin-off companies	3.6
Provide services to other ICT, companies, public and third sector institutions	3.2
Provide service to independent inventors/researchers	2.9

Among the presented metrics, respondents indicated which ones they use to measure their performance. The result, presented in Graph 10, was, in descending order: “total number of intellectual property protection applications filed,” indicated by 93.1% of respondents; “total number of intellectual property protection applications granted,” indicated by 88.5%; “total number of invention disclosures received,” by 75.4%; “total number of services provided to the ICT's own researchers/inventors,” by 72.3%; “total number of licensing agreements signed,” by 61.5%; “total number of collaborative research agreements signed,” by 60.0%; “revenue generated through collaborative research agreements” and “revenue generated through licensing agreements,” both indicated by 45.4%; “total number of spin-off companies created,” by 32.3%; and lastly, “total number of services provided to independent researchers/inventors,” indicated by 28.5% of respondents.

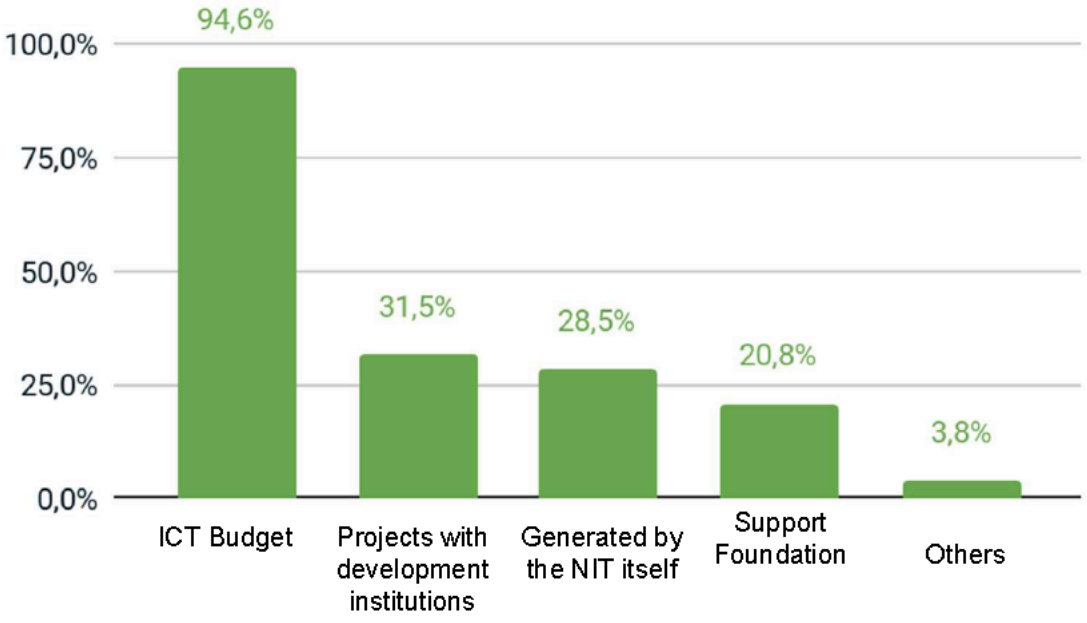
Graph10 - Performance metrics used by NIT



3.8. NIT Maintenance Resources

This year, with the objective of understanding the main sources of funding that sustain the NIT, a new question was added. The responses, in descending order, were the ICT budget, indicated by 123 respondents (94.6%); projects with funding institutions, such as Finep, CNPq, and FAPs, by 41 (32.5%); resources generated by the NIT itself from royalties, licensing revenues, provision of services, etc., by 37 (28.5%); the Support Foundation, by 27 (20.8%); and other sources, by 5 (3.8%). Among the other sources, compensation for indirect costs of projects in partnership with companies and partnership with SEBRAE were mentioned. Graph 11 summarizes the responses.

Graph 11 - Funding sources for NIT maintenance



4. INTELLECTUAL PROPERTY MANAGEMENT, TECHNOLOGY TRANSFER, INNOVATION POLICIES, ENTREPRENEURSHIP, AND PARTNERSHIPS

4.1. Results of intellectual property management

Continuing with the information obtained by the Survey, the third part of the questionnaire concerns the results of intellectual property management, which aligns with the objectives and metrics indicated as relevant for NIT and also as one of the many functions of these offices. This section of the report describes the results of this topic, in addition to others related to innovation policies and entrepreneurship activities.

4.1.1. Invention Disclosures and Intellectual Property Protection Applications filed in the base year

Of the 130 surveyed NIT, 114 (87.7%) received invention disclosures in the 2023 base year. The average number of invention disclosures per respondent was 23.7, while the median was 12.

Regarding IP protection applications filed in Brazil in the base year, 95 respondents stated they had filed invention patent applications, a number close to that of NIT that filed IP computer program applications, 94; while 67 NIT reported having filed trademark registrations.

A total of 2,638 IP applications were filed by ICT, comprising 1,098 patent applications, 1,023 computer programs, 326 trademarks, 67 utility models, 7 cultivars, and 117 from other categories (industrial design, circuit topography, geographical indication, among others).

The average number of IP protection applications in Brazil per respondent in the base year 2023 was 20.4, while the median was 11.5. Table 8, below, summarizes this data and provides further details.

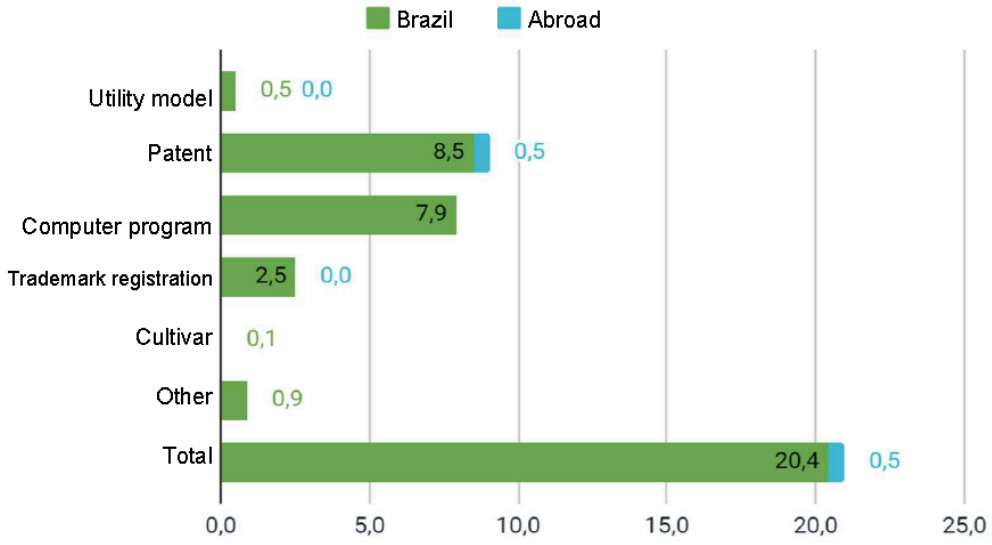
Table 8 - Overview of intellectual property applications filed by ICT in Brazil in base year 2023

Filed in the year	Total	Average/NIT	%	Median
Utility model	67	0.5	2.5%	0
Patent	1098	8.5	41.6%	3
Computer program	1023	7.9	38.8%	4
Trademark registration	326	2.5	12.4%	1
Cultivar	7	0.1	0.3%	0
Other	117	0.9	4.4%	0
Total	**2638**	**20.4**	**100.0%**	**11.5**

As for IP protection applications abroad, there were 70, with 69 being patent applications, filed by 14 NIT, and 1 trademark registration by 1 NIT. These applications include those filed directly abroad and entries into the national phase. It is worth noting that the same technology filed in different countries may have been counted more than once. PCT applications were considered separately. There were 14 respondents who filed PCT applications (international patent applications under the Patent Cooperation Treaty – the term PCT comes from the English Patent Cooperation Treaty), with 48 patents filed and 2 utility models.

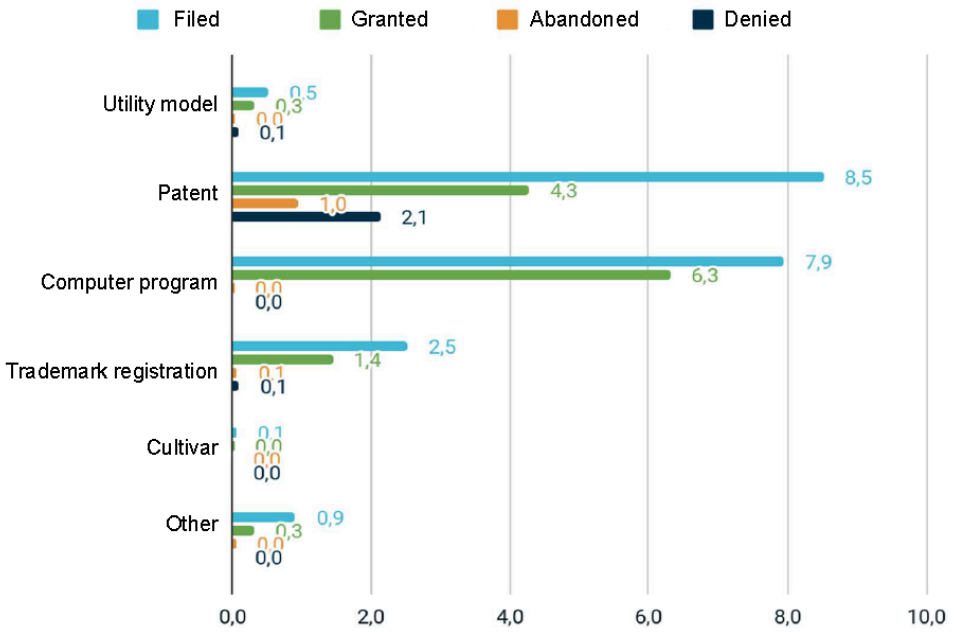
Graph 12, below, provides a comparison between the IP protection applications filed by NIT in Brazil and abroad in the 2023 base year.

Graph 12 - Intellectual property protection applications filed in base year 2023 [average per NIT]


Brazil
Abroad
Utility model
Patent
Computer program
Trademark registration
Cultivar
Other
Total
0,5
0,0
8,5
0,5
7,9
2,5
0,0
0,1
0,9
20,4
0,5
0,0
5,0
10,0
15,0
20,0
25,0

Since the last edition of the Survey, some new information has been requested regarding intellectual property management. In addition to the IP applications filed during the year, questions were asked about the number of IPs granted, abandoned, rejected, and active in the base year, as well as those granted up to the base year – accounting for those granted in previous years. This new information allows for a deeper understanding of the NIT IP processes. Graph 13 summarizes this information by IP type and its status.

Graph 13 -IP filed, granted, abandoned, and rejected in base year 2023 [average per NIT]



Considering all applications filed by ICT that were active/in force in 2023 (including those filed in previous years), respondents had filed a total in Brazil of 11,069 patent applications, 508 utility models, 6,560 computer programs, 2,469 trademarks, 146 cultivars, and 1,066 from other categories (industrial design, circuit topography, geographical indication, among others). Overall, the average total of active IP protection applications in Brazil per respondent was 169.1, and the median was 74.

Additionally, by the end of the 2023 base year, 30 respondents were responsible for filing 1,047 active patent applications abroad[2], while 3 participants filed 5 active utility models and 3 participants registered 91 trademarks via the Madrid Protocol[3].

Table 9, below, summarizes this data and provides further details. Again, the apparent discrepancy between the average and median values was caused by the presence of a few participants who demonstrated high inventive activity.

Table 9 - Overview of intellectual property applications filed by ICT in Brazil by the end of base year 2023 (accounting for previous years)

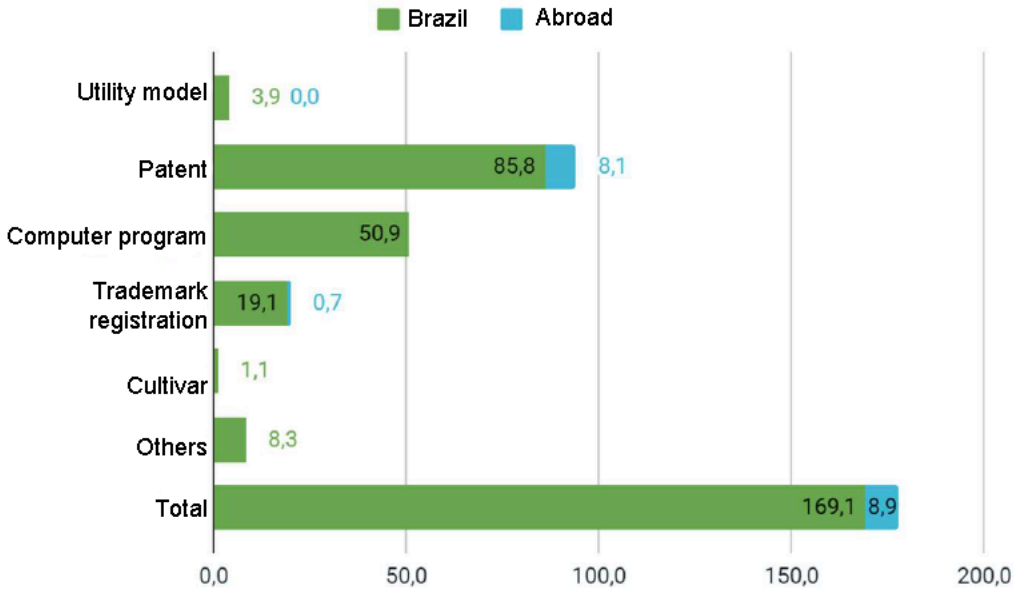
	Quantity	Average/NIT	%	Median
Utility model	508	3.9	2.3%	1.0
Patent	11069	85.8	50.7%	19.0
Computer program	6560	50.9	30.1%	23.0
Trademark registration	2469	19.1	11.3%	8.0
Cultivar	146	1.1	0.7%	0.0
Other	1066	8.3	4.9%	0.0
Total	**21818**	**169.1**	**100.0%**	**74.0**

Graph 14, below, provides a comparison between the IP protection applications filed by NIT in Brazil and abroad until the end of the 2023 base year.

[2] These applications include those filed directly abroad and entries into the national phase. It is worth noting that the same technology filed in different countries may have been counted more than once. PCT applications were counted separately.

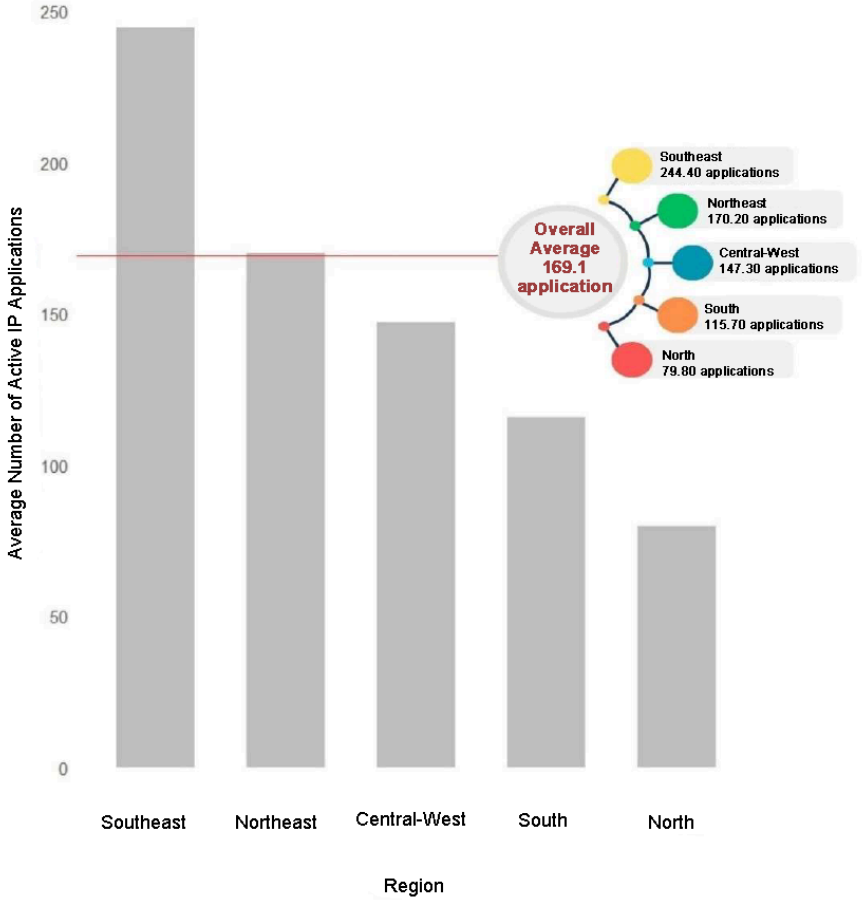
[3]The Madrid Protocol is an international treaty that aims to protect trademarks in approximately 128 signatory countries (this number may change at any time) through a single registration. Access the countries at: https://www.wipo.int/madrid/memberprofiles/selectmember.

Graph 14 - Total active intellectual property protection applications in base year 2023 [average per respondent]



The IP modality with the most active applications are patents, with 85.8, and computer programs, with 50.9. Active patent applications abroad are not very significant in terms of quantity. Considering the average number of active IPs per region, we have the representation in Graph 15, which includes the national general average.

Graph 15 - Average active IP applications by region in Brazil



The overall general average is 169.1 active intellectual property applications in the 2023 base year, while the median is 74.0. Graph 15 shows that the Southeast Region, with 244.4 applications, the Northeast Region (170.2 applications), and the Center-West Region (147.3) stood out, presenting an average of active IP applications above the national average.

4.1.2. Accumulated national and international intellectual property protection applications and grants

Regarding the accumulated number of filed and granted applications—that is, those filed and granted in previous years up to 2023—there is an average of 169.1 active IPs and 98.6 granted IPs per NIT, resulting in a ratio of 0.6 granted IPs for every active IP. This value, however, varies for each IP type, with the highest ratio observed for patents and other IP types, showing a proportion of 0.4 granted applications for each filing; followed by utility models, with a proportion of 0.5; 0.8 for trademark registrations, 0.9 for computer programs, and a higher ratio of grants for cultivars, with a proportion of

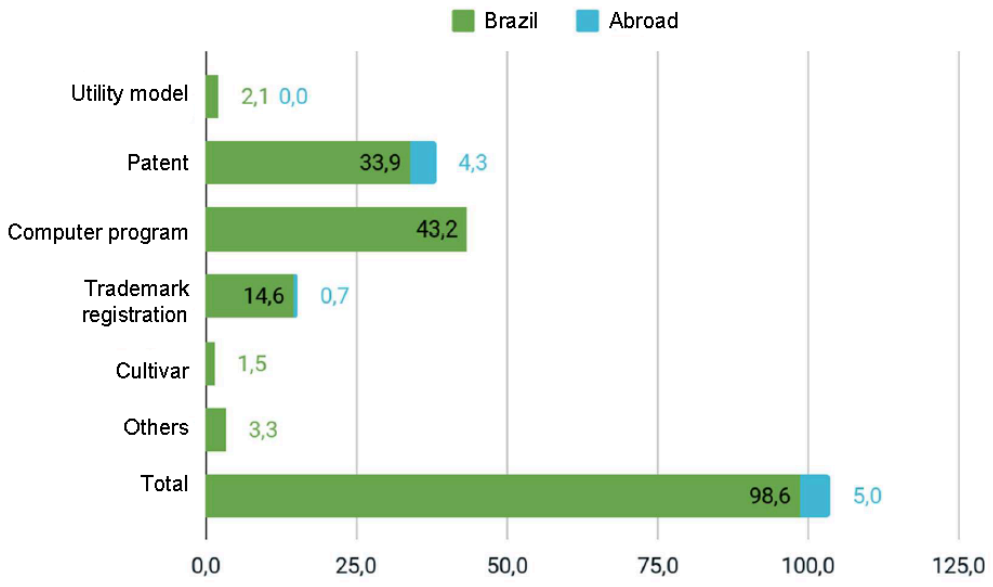
1.3.

The larger discrepancy in the case of patents stems from the time required for INPI (National Institute of Industrial Property) to evaluate and grant patent applications. However, due to the implementation of the Backlog Combat Project by the agency, aimed at “substantially reducing the number of pending patent applications within a 2-year period,” the analysis and granting time has been decreasing, making it possible for a patent to be granted within 2 to 4 years.

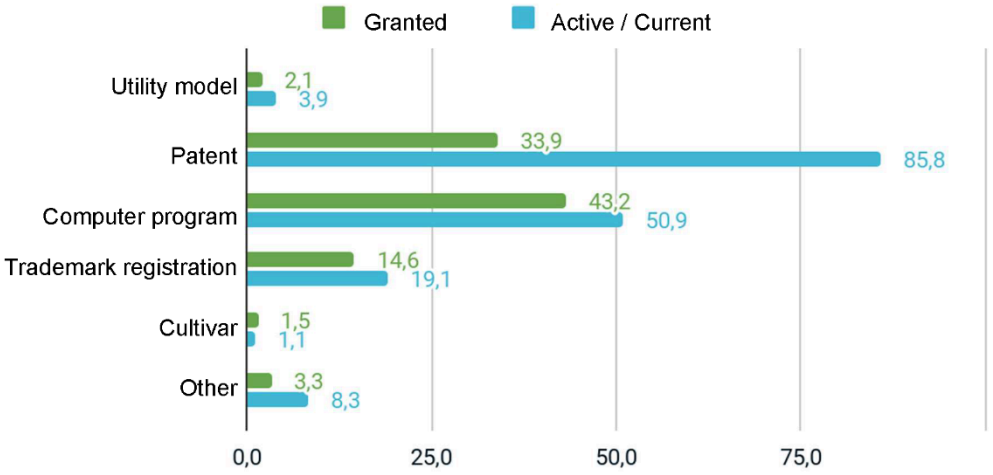
Regarding computer program grants, the greater speed is due to the fact that these rights are linked to copyright law, as they do not depend on technical examination and their registration is not mandatory. Consequently, the average granting period is seven days, which is considerably faster than patent examination.

Graph 16, below, provides a comparison between the total grants until the end of the 2023 base year (also encompassing previous years), in Brazil and abroad, based on the average applications per NIT. Graph 17 presents a comparison between the averages of the accumulated totals until 2023 for active and granted IP applications by technology type.

Graph 16 - Intellectual property protection applications granted by the end of base year 2023 (also considering all grants made in previous years) [average per respondent]



Graph 17 - Intellectual property protection applications granted and active/in force by the year 2023 [average per respondent]



4.1.3. IP Co-ownership

This year, a new question was added to the Survey, focusing on the existence of IP co-ownership. As various research initiatives are conducted in partnership between ICT and companies or among different ICT, whether national or foreign, the survey inquired about how many of the IP applications filed in the base year involve co-ownership in their creation and filing. Table 10 presents the result of the question.

Table 10 - IP filed with co-ownership in base year 2023

Institutions involved	Quantity	Average/NIT	% of IP filed in the year
Other Brazilian ICT only	256	2.0	9.7%
Foreign ICT only	10	0.1	0.4%
Companies only	134	1.0	5.1%
Other Brazilian ICT and foreign ICT	14	0.1	0.5%
Other Brazilian ICT and companies	53	0.4	2.0%
Foreign ICT and companies	51	0.4	1.9%
Total	**518**	**4.0**	**19.6%**

Among the IP applications filed under co-ownership, a higher incidence is observed for filings made with other Brazilian ICT (256) and companies (134). This corresponds to 9.7% and 5.1% of the total IP filed in the year, respectively. Among the queried categories, those involving companies, whether with other ICT or not, account for a total of 238 IPs, representing 45.9% of IPs filed under co-ownership and 9.0% of the total IP filed in the year.

4.2 Results of technology transfer

4.2.1. Licensing agreements

Based on the collected data, it was verified that 31 respondents (23.8%) signed a total of 276 new licensing agreements in 2023. Of these, 1 is from the Northeast region, 4 from the Center-West, 10 from the South, 16 from the Southeast, and none from the North. The total number of new agreements shows an average of 2.1 licenses per NIT when all respondents are considered, and 8.9 when only the 31 that signed new agreements are considered.

Regarding the agreements signed in 2023, questions were posed about the size of the company[4] with which the agreement was celebrated and whether the contract had exclusivity. Since the size of companies is not always known by respondents, the option "unknown size" was added this year. Table 11 summarizes this information.

[4] The size of the company was considered according to its annual revenue: Small-sized - Annual revenue equal to or less than BRL 4,800,000.00; Medium-sized - Annual revenue between BRL 4,800,000.00 and BRL 20,000,000.00; Large-sized - Annual revenue greater than BRL 20,000,000.00.

Table 11 - Number of licenses issued in 2023 by company size and exclusivity

	With exclusivity				Without exclusivity			
	Small size	Medium Size	Large	Unknown Size	Small size	Medium Size	Large	Unknown Size
Licensing of invention patents or utility models	14	1	4	2	15	4	9	4
Computer program licensing	2	1	1	5	10	0	8	7
Brand licensing	5	0	0	0	6	0	0	1
Cultivar licensing	0	0	0	0	2	3	0	27
Know-how licensing	5	0	18	1	17	0	92	1
Biological material transfer agreements associated with licensing	1	0	1	0	1	0	1	0
Other licensing	0	0	1	0	0	0	0	0

Regarding active licensing agreements in the 2023 base year, 47 NIT (36.2% of respondents) reported having a total of 1030 agreements (including those signed in previous years and still active in 2023). Considering only licenses that generated revenue in the 2023 base year (including agreements signed in previous years but that generated revenue in the 2023 base year), a total of 397 agreements were observed, signed by 29 of the 130 respondents (22.3%). The amount collected through these agreements in 2023 was approximately BRL 13.6 million. It is noteworthy that this value should be even higher, as one respondent with revenue-generating licensing agreements did not report the year's revenue amount.

Table 12 below provides an overview of the licensing activities reported by the respondents.

Table 12 - Overview of reported licensing activities

	All respondents (N=130)		Respondents who stated they had current licensing agreements (N=47)
	Average	Total	Average
Licensing agreements signed in 2023	2.1	276	8.9
Exclusive*	0.6	85	1.8
Non-exclusive*	1.3	171	3.6
Collaboration with licensor	0.5	69	4.1
Agreements in force in 2023	7.9	1030	21.9
Licensing agreements that generated revenue in 2023	3.0	397	13.7
Total revenue from licensing agreements in 2023 [in BRL 1,000]	105.6**	13,622.9**	289.8
Percentage of licensing revenue assigned to inventors [%]***	-	-	35.5

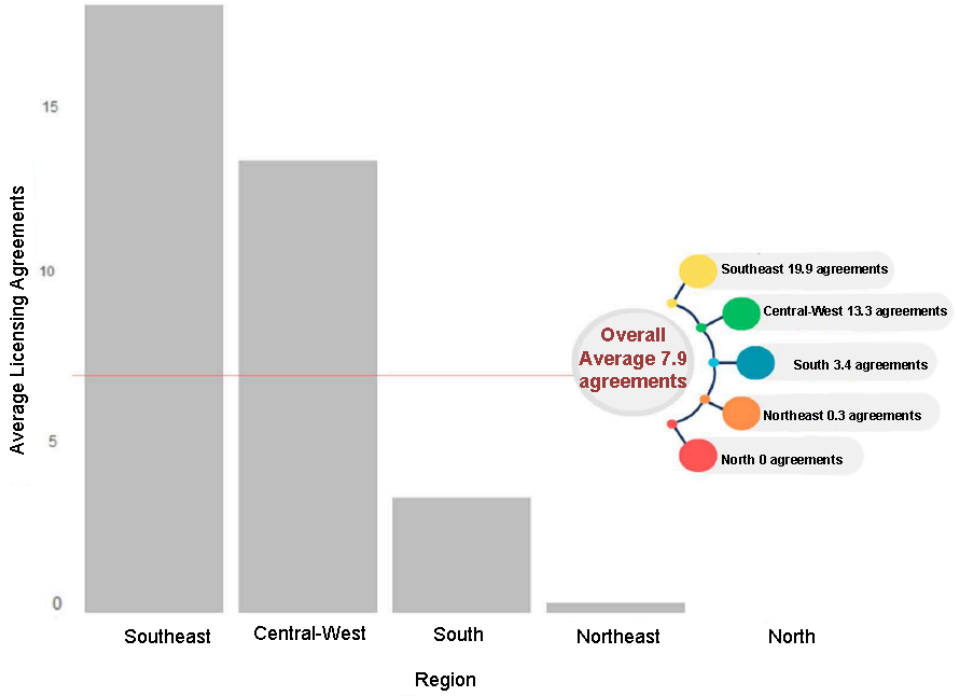
* The exclusivity of agreements was not reported by one respondent.
** N=129
** It was decided not to calculate the average and median relative to the calculation with all respondents, given that many did not sign licensing agreements and consequently did not share royalties with researcher-inventors. For this calculation, only respondents who obtained revenue from licensing agreements were considered.

Analyzing the active licensing agreements in 2023, an average of 47.2 licenses per 1,000 active national IP protection applications was observed. Conversely, the average number of licensing agreements per full-time equivalent (FTE) NIT professional was 0.9 licenses/FTE. Evaluating only the agreements that generated revenue in 2023, an average of 18.2 agreements per 1,000 national IP protection applications was observed. As for the number of licensing agreements that generated revenue in 2023 per full-time equivalent (FTE) NIT professional, the average was 0.3 licenses/FTE.

Two other indicators were also considered: the total revenue obtained through licensing per national IP protection application, and the total revenue obtained through licensing per respondent's FTE. The average of the first indicator was BRL 624.39/active national IP protection application in 2023, while the average of the second indicator was BRL 11,258.58/FTE in 2023.

In this edition, the analysis of averages by region was included. The following information will be presented: average active licensing agreements per region (Graph 18); average licensing agreements per region without revenue and with revenue (Table 13).

Graph 18 - Average of active licensing agreements by region in Brazil



The Southeast and Center-West regions are above the national average for active licensing agreements per NIT (7.9), with 17.9 and 13.3 respectively. This means the averages for the Southeast and Center-West are approximately 2.5 and 1.9 times greater than the national average. The South (3.4) and Northeast (0.3) regions are below the average, while the North has no active licensing agreements.

Regarding active agreements that generated or did not generate revenue in the 2023 base year, Table 13 presents a comparison of percentages by region.

Table 13 - Active licensing agreements with and without revenue by region

	No. of agreements	% with revenue	% without revenue
Central-West	133	39.8%	60.2%
Northeast	8	25.0%	75.0%
North	0	0.0%	0.0%
Southeast	786	39.4%	60.6%
South	103	31.1%	68.9%

It is observed that there is a certain proximity between the percentages of agreements with and without revenue across regions, with the exception of the Northeast. The Center-West region has the highest percentage of agreements with revenue (39.8%), while the Northeast shows the lowest (25%). The Southeast and South fall into the intermediate range between the mentioned regions, with values of 39.4% and 31.1% respectively. It is thus emphasized that there is still a considerable number of agreements signed without revenue in NIT.

Regarding licensing agreements signed in the 2023 base year, 69 resulted from collaborative projects with the licensor. Of the agreements that did not generate revenue, 55 resulted in the receipt of other types of resources. Finally, NIT indicated an average of 6.3 months as the time elapsed between the start of negotiation and the signing of the licensing agreement, considering the 29 NIT that reported a value greater than zero.

The signing of licensing agreements is a more complex process than intellectual property protection applications, as it depends on idiosyncratic factors such as the nature of the technology in question, its stage of development, the time for negotiation and execution of the contract signature, institutional policies related to technology transfer, and the skill set of the team involved in the technology transfer process. Thus, it is normal for Brazilian NIT, being relatively young, to be more focused on IP protection activities than on technology transfer activities.

Table 14 below presents some data related to intellectual property management comparatively across the survey years, between 2017 and 2023. There is a noticeable increase in the average number of licensing agreements in force per NIT. The remaining data, except for the average collected value—which fluctuates due to a few NIT with high income concentration—show subtle variations between periods.

Table 14 - Highlights of IP Management by survey base year

	2017	2018	2019	2020	2021	2022	2023
Average IP Applications Filed	16.4	18.2	19.1	17.4	16.9	16.9	20.4
Average IP Applications Granted	8.9	10.2	9.9	11.1	15.7	11.1	12.7
% NIT with licensing	24.5%	21.2%	24.2%	28.8%	36.2%	38.2%	36.2%
Average Active Licensing Agreements per NIT	7.2	6.1	5.6	6.3	7.1	5.8	7.9
Active Agreements / Revenue-generating agreements	3.1	2.1	2.0	2.8	2.5	2.2	2.6
Average Revenue Collected per NIT	BRL 97,058.82	BRL 1,336,283.19	BRL 313,281.25	BRL 120,863.31	BRL 349,110.29	BRL 218,128.48	BRL 105,603.73

4.2.2. Assignment of rights

Regarding the assignment of creation rights, it is observed that 11 respondents (8.6%) have signed assignment agreements, while 117 (91.4%) reported not having such agreements. Two NIT did not respond to the question.

The types of IP assigned were: 14 trademarks, 10 computer programs, 7 invention patents or utility models, and 1 cultivar, totaling 32 IP assignments.

4.3. Expenditures on intellectual property protection, maintenance, and commercialization

Among the respondents, 109 incurred expenditures, totaling approximately BRL 8.3 million. These values varied greatly among survey participants, showing an average value of BRL 64,300 and a median value of BRL 12,400. The largest portion of expenditures was related to intellectual property registration and maintenance fees[5] in the 2023 base year, totaling BRL 8.1 million, expended by 108 respondents, followed by other expenditures totaling BRL 219,000, incurred by 15 respondents. Regarding expenditures on legal representation in lawsuits, no participant reported having incurred this expense.

[5]Fees from INPI and other patent offices, both in Brazil and abroad; software licenses and database subscriptions; outsourcing of prior art search services, drafting of national and international patents, and filing and monitoring of patents both in Brazil and abroad; and outsourcing of services related to technology transfer (technology valuation, development of commercialization strategies, search for licensing partners, negotiation, and drafting of licensing agreements).

4.4 Research partnership agreements

Regarding research partnership agreements, 17 respondents (13.1%) reported being responsible for managing all collaborative research projects in ICT, while 52 (40%) reported being responsible for managing some of the collaborative research projects in ICT. The other 61 (46.9%) respondents reported not being responsible for managing collaborative research projects in ICT.

As for the revenue from such agreements, 39 NIT reported having revenue, totaling BRL 2 billion, a considerably high figure for an ICT, which presents a total revenue of BRL 1.3 billion, corresponding to 64% of the total collected.

4.5 Spin-offs

Regarding spin-offs created from ICT, the first question concerns NITs' knowledge about their creation. Of the 128 NIT that responded to the question (two did not respond), only 15 (11.7%) have knowledge about the creation of all spin-offs, 41 (32%) have knowledge of some, and the majority, 72 (56.3%), have no knowledge about spin-offs created within their respective ICT.

Based on these results, the following information is based on the 56 responses from NIT that monitor some or all companies created within the ICT. Tables 15 and 16 concern spin-offs created in 2023 and previous years.

Regarding spin-offs created in 2023, Table 15 shows that, considering NIT that monitor all or some of these companies, there is a predominance of Public Institutions and Higher Education Institutions in both cases. In 2023, 42 spin-offs were created. The southeast region stands out. No ICT participates in the equity capital of the spin-offs, and 46.4% of spin-offs are created by researchers/professors—for those that monitor some.

Table 15 - Spin-offs created in 2023

	NIT that monitor all spin-offs (N=15)			NIT that monitor some spin-offs (N=41)		
	Quantity	%	Average	Quantity	%	Average
Total	**14**			**27**		
By licensing	6	42.9%	0.4	4	14.81%	0.1
Without licensing	8	57.1%	0.5	23	85.19%	0.6
With equity participation	0	0.0%	0.0	0	0.00%	0.0
Created by researchers/professors	11	78.6%	0.7	34*	125.93%	0.8
Average per 1000 IP filed	0.64	-	-	1.24	-	-
Average per FTE	0.01	-	-	0.02	-	-
By type of institution						
Public	12	85.7%	1.2	25	92.59%	0.8
Private	2	14.3%	0.5	2	7.41%	0.3
Other	0	0.0%	0	0	0.00%	0.0
By nature of ICT						
Higher Education Institution	11	78.6%	1.8	27	100.00%	0.2
Research Institute	0	0.0%	0.0	0	0.00%	0.0
Professional and Technological Education Institute	3	21.4%	1.0	0	0.00%	0.0
Other	0	0.0%	0.0	0	0.00%	0.0
By region						
Central-West	0	0.0%	-	7	25.93%	-
Northeast	3	21.4%	-	2	7.41%	-
North	3	21.4%	-	0	0.00%	-
Southeast	6	42.9%	-	17	62.96%	-
South	2	14.3%	-	1	3.70%	-

* One NIT reported the total number of spin-offs created by researchers but did not specify whether they originated from licensing agreements.

Regarding spin-offs created up to 2023, Table 16, which covers both NIT monitoring all and some spin-offs, also shows a predominance of Public Institutions. In terms of nature, Higher Education Institutions hold the largest percentage, at 96.2% for NIT monitoring all spin-offs, and 95.7% for those monitoring some. Regarding regions, the Southeast stands out, with NIT monitoring all spin-offs at 88.5% and NIT monitoring some at 60.9%. Only one ICT participates in the equity capital of spin-offs, and 78.8% of spin-offs are created by researchers/professors—for those that monitor all spin-offs, and

2.2% for those that monitor some.

Table 16 - Spin-offs created until 2023

	NIT that monitor all spin-offs (N=15)			NIT that monitor some spin-offs (N=41)		
	Quantity	%	Average	Quantity	%	Average
Total	**104**			**138**		
By licensing	37	35.6%	2.5	73	52.9%	1.78
Without licensing	67	64.4%	4.5	65	47.1%	1.59
With equity participation	0	0.0%	0.0	1	0.7%	0.02
Created by researchers/professors	82	78.8%	5.5	3	2.2%	0.07
Average per 1000 IP filed	4.77	-	-	6.33	-	-
Average per FTE	0.09	-	-	0.11	-	-
By type of institution						
Public	100	96.2%	10.0	136	98.6%	4.1
Private	4	3.8%	1.0	2	1.4%	0.1
Other	0	0.0%	0	0	0.0%	0.0
By nature of ICT						
Higher Education Institution	100	96.2%	16.7	132	95.7%	4.0
Research Institute	2	1.9%	0.5	6	4.3%	1.5
Professional and Technological Education Institute	2	1.9%	0.7	0	0.0%	0.0
Other	0	0.0%	0.0	0	0.0%	0.0
By region						
Central-West	0	0.0%	-	49	35.5%	-
Northeast	0	0.0%	-	0	0.0%	-
North	0	0.0%	-	2	1.4%	-
Southeast	92	88.5%	-	84	60.9%	-
South	12	11.5%	-	3	2.2%	-

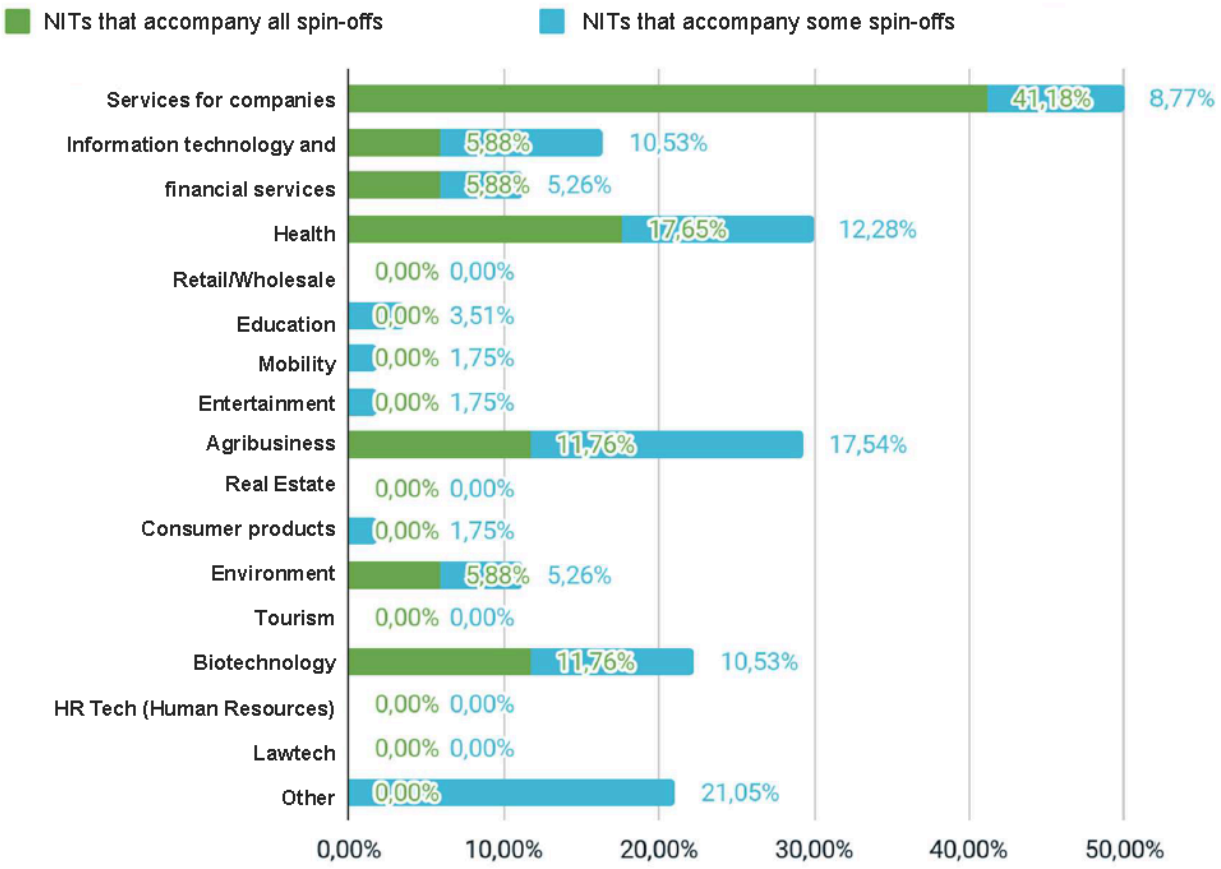
Since the 2022 edition of the Survey, one question concerns the existence or not of conflict-of-interest regulations in the creation of spin-offs. Only 19 respondents (out of 128 who answered the question) stated that they had this type of regulation.

4.5.1. Market sectors of operation

Regarding the sectors in which spin-off companies operate in the market, respondents specified the number of spin-offs by economic activity sectors[6]. The group of NIT that has knowledge about all spin-offs indicated services provided to companies as the area with the highest number of spin-offs (7). For the group that monitors some spin-offs, the most recurrent areas are the agribusiness sector (10) and other sectors (12).

The remaining sectors, for each group, are indicated in Graph 19.

Graph 19 - Spin-offs by economic sector [%]

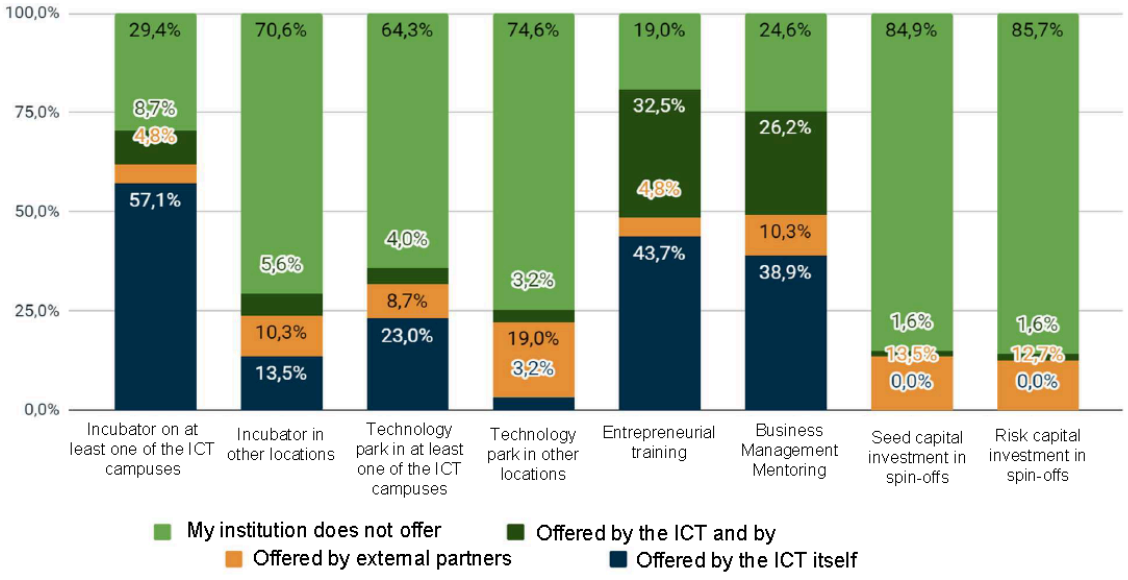


[6] The sectors chosen for the Survey were based on those used in ABStartups' mappings, with adaptations.

4.5.2. Support mechanisms

The respondents of the FORTEC Innovation Survey indicated the support mechanisms offered by ICT and/or external partners to support spin-off companies, through incubators in at least one of the ICT's campuses, incubators in other locations, technology parks in at least one of the ICT's campuses, technology parks in other locations, entrepreneurial training, business management mentoring, seed capital investment in spin-offs, and venture capital investments in spin-offs. Based on the collected data, it was observed that a significant portion of respondents (57.1%) offer incubators within the ICT itself, as well as entrepreneurial training (43.7%) as support mechanisms for spin-offs. On the other hand, technology parks are a mechanism offered with low frequency by responding institutions and their partners (3.2%). When analyzing seed capital investment mechanisms in spin-offs and venture capital investment in spin-offs, it is seen that most respondents declared that ICT do not offer these types of support (84.9% and 85.7% respectively). Graph 20 presents a summary of the results of support mechanisms offered to entrepreneurial researchers by ICT based on the responses of 126 NIT (4 did not answer the question).

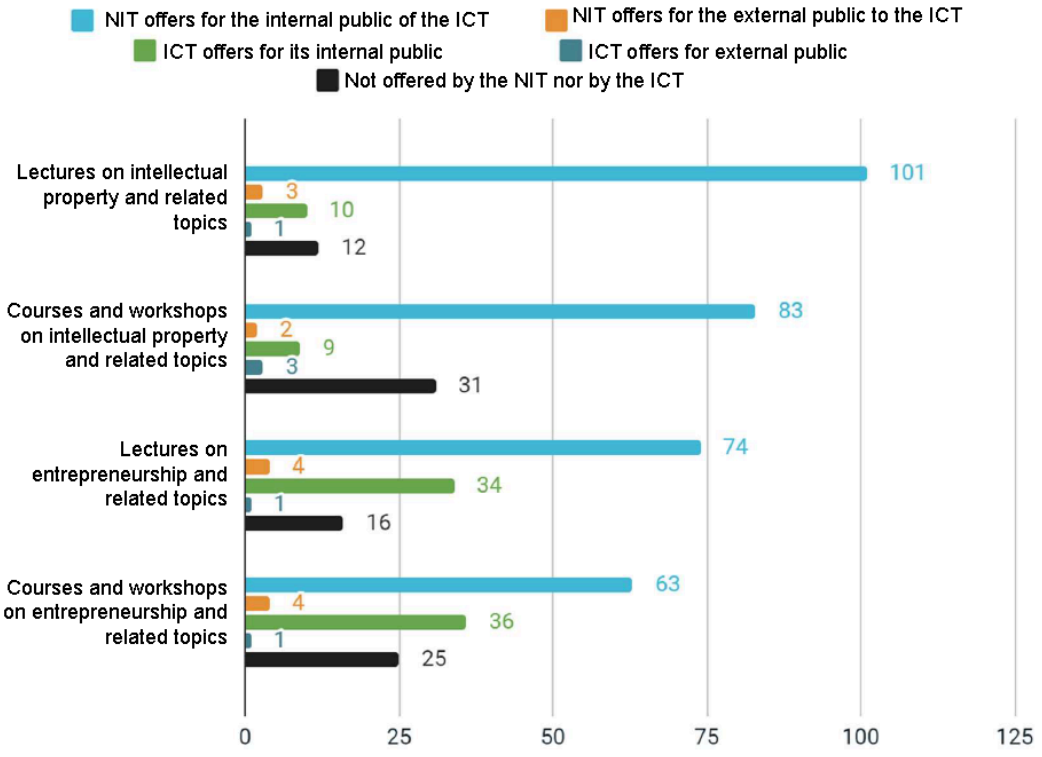
Graph 20 - Support mechanisms for start-ups [%]



4.6 Offerings of courses on entrepreneurship, intellectual property, and related topics

Of the 130 respondents to the FORTEC Innovation Survey, 127 evaluated the offering, by NIT and ICT, of lectures, courses, and workshops on intellectual property, entrepreneurship, and related topics. Based on the collected data, it was observed that a good portion of respondents offered training for the internal public of ICT (the offering for the external public is considerably smaller), with these being mostly on topics related to intellectual property. In fact, the offering of IP training is predominantly done by NIT, with initiatives from ICT as a whole being timid. Graph 21 provides a compilation of the observed results, dividing the offering of lectures and courses into 4 categories: offered by the NIT to the internal public of the ICT; offered by the NIT to the external public of the ICT; offered by the ICT to the internal public of the ICT; and offered by the ICT to the external public of the ICT. It is worth noting that these categories are not mutually exclusive.

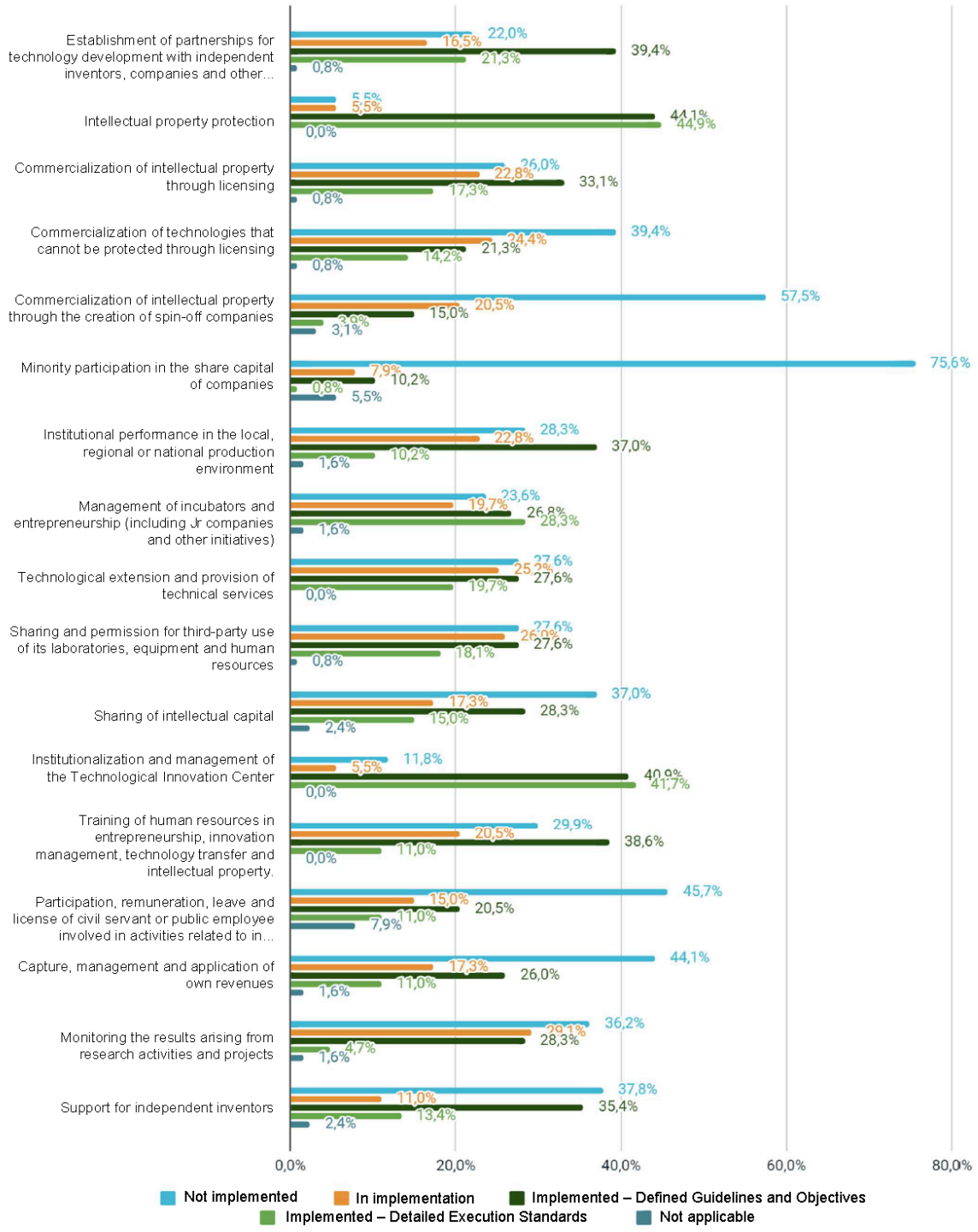
Graph 21 - Offer of lectures and courses on intellectual property, entrepreneurship, and related topics [%]



4.7. Innovation Policies

To detect and evaluate the implementation of regulations related to IP, TT, entrepreneurship, and innovation management within their institutions, respondents classified each of these regulations into five categories: “not implemented,” “in implementation,” “implemented – defined guidelines and objectives,” “implemented – detailed execution standards,” and “not applicable.” Graph 22 summarizes the results of the responses from 127 NIT – three did not answer the question

Graph 22 - Institutionalization of technology innovation support policies [%]



It is noteworthy that more than half of the respondents had not implemented policies by the end of 2023 to institutionalize i. minority participation in the equity capital of companies (75.6%) and ii. the commercialization of intellectual property through the creation of spin-off companies (57.5%). Among the policies that were in implementation, three were cited by more than 25% of respondents: i. monitoring of results from research activities and projects (29.1%); ii. sharing and permission for third-party use of its laboratories, equipment, and human resources (26%); and iii. technological extension and provision of technical services (25.2%). However, intellectual property protection received the minimum percentage of respondents, at 5.5%.

Among the implemented policies that had defined guidelines and objectives, the following were cited by more than 30% of respondents: i. intellectual property protection (44.1%); ii. institutionalization and management of the Technology Innovation Center (40.9%); iii. establishment of partnerships for technology development with independent inventors, companies, and other entities (39.4%); iv. human resource training in entrepreneurship, innovation management, technology transfer, and intellectual property (38.6%); v. institutional engagement in the local, regional, or national productive environment (37.0%); vi. services to independent inventors (35.4%); and vii. commercialization of intellectual property through licensing (33.1%).

Among the implemented policies that had detailed execution standards, only the following two were cited by more than 30% of respondents: i. intellectual property protection (44.9%); and ii. institutionalization and management of the NIT (41.7%). Along the same lines, the policy with the lowest percentage of respondents was minority participation in the equity capital of companies (0.8%).

Policies classified as not applicable by more than 5% of respondents included: i. participation, remuneration, leave, and license of public servants or employees involved in technology innovation-related activities (7.9%); and ii. minority participation in the equity capital of companies (5.5%).

Respondents also evaluated the quality of implemented policies on a 5-point scale, ranging from 1 (ambiguous and/or overly bureaucratic regulation, difficult to implement) to 5 (clear, well-defined, and non-bureaucratic regulation, easy to implement). Table 17 presents an overview of the quality assessment of policies

implemented in responding ICT.

Table 17 - Overview of the quality assessment of policies implemented in ICT [average per respondent]

	Implemented - general		Implemented - Defined Guidelines and Objectives		Implemented - Detailed Implementation Rules	
	Average	N	Average	N	Average	N
Establishing partnerships for technology development with independent inventors, companies and other entities	4.0	77	3.9	50	4.2	27
Intellectual property protection	4.4	113	4.1	56	4.8	57
Commercialization of intellectual property through licensing	4.0	64	3.8	42	4.4	22
Commercialization of technologies that cannot be protected through licensing	3.9	45	3.8	27	4.2	18
Commercialization of intellectual property through the creation of spin-off companies	3.5	24	3.5	19	3.6	5
Minority participation in the share capital of companies	3.2	14	3.2	13	3.0	1
Institutional performance in the local, regional or national production environment	3.9	60	3.8	47	4.3	13
Management of incubators and entrepreneurship (including Jr companies and other initiatives)	4.1	70	3.9	34	4.3	36
Technological extension and provision of technical services	4.0	60	4.0	35	4.1	25
Sharing and permission for third-party use of its laboratories, equipment and human resources	3.7	57	3.7	35	3.7	22
Sharing of intellectual capital	3.8	54	3.8	36	4.0	18
Institutionalization and management of the Technological Innovation Center	4.2	105	3.9	52	4.5	53
Training of human resources in entrepreneurship, innovation management, technology transfer and intellectual property.	3.9	63	3.8	49	4.4	14
Participation, remuneration, leave, and license of public servants or employees involved in activities related to Technological Innovation	3.7	40	3.5	26	3.9	14
Capture, management and application of own revenues	3.8	47	3.8	33	3.9	14
Monitoring the results arising from research activities and projects	4.0	42	4.0	36	3.8	6
Support for independent inventors	3.7	62	3.6	45	4.1	17

4.8. Information systems

The purpose of this question is to provide a database where one can consult the link or access method for information related to the ICT's competencies. Participants were invited to report the presence or absence of information systems[7], websites, or applications in their ICT aimed at disseminating and promoting their innovation-related productions. These productions may include intangible assets, such as intellectual property subject to protection, as well as academic achievements like articles, dissertations, theses, and others.

The questions were formatted according to the type of information vectors available in the respective systems, as follows: 1) protected intellectual property; 2) licensed intellectual property; 3) spin-offs; 4) daughter companies[8]; 5) junior companies[9]; 6) services provided by the ICT; 7) specialists or groups of specialists who provide services; 8) available laboratories, equipment, and other infrastructure; 9) professors and researchers and their competencies and areas of knowledge; 10) scientific production of professors and researchers; 11) research and extension projects of professors and researchers; 12) services provided by the NIT to the ICT; 13) internal legislation and regulation within the ICT on innovation; 14) innovation training opportunities; 15) others.

In this edition, the information vectors implemented by more than 50% of respondents were: i. internal legislation and regulation within the ICT on innovation (67.7%); ii. services provided by the NIT to the ICT (60.8%); protected intellectual property (56.2%); and iii. available laboratories, equipment, and other infrastructure (53.8%). Conversely, the vectors implemented by 10% or less of respondents were: i. created spin-offs (10.0%); ii. daughter companies (9.2%); and others (5.4%). Graph 23 presents a summary of the percentage of ICT that have systems per information vector.

[7] Information System: constitutes a set of interrelated data that retrieves, processes, stores, and distributes information (LAUDON and LAUDON, 1999). In this specific case, it unites information from responding ICT into a database. This system is not for management but for public consultation.

[8] Daughter companies: a company created by students or former students of the ICT.

[9] Junior companies: a non-profit civil association, formed and managed by students of ICT courses, aimed at developing consulting projects in the students' area of study; fostering practical university learning; and bringing the labor market closer to academia.

Graph 23 - Percentage of ICT

that have information system for research type of information v

ector

5. FINAL CONSIDERATIONS

In this edition of the FORTEC Innovation Survey, a smaller number of participants was recorded compared to the previous year, totaling 130 NIT in the 2023 base year, representing 146 ICT nationwide. This year marks the eighth edition of the survey. In terms of participants numbers, 2023 ranks fifth among all editions. The reduction in participants may be associated with strikes faced by some institutions in 2024. In 2023, new NIT were included, while some participants from previous years chose not to contribute to this edition. This variation is common due to the voluntary nature of survey completion and changes in the management of NIT, ICT and their staff. The 2023 FORTEC Innovation Survey Report presents significant advances in strengthening NIT and their integration into ICT but also reveals challenges that need to be addressed to consolidate a more efficient innovation ecosystem in Brazil.

One of the highlighted positive aspects is the enhancement of strategic planning. With 93.8% of NIT aligned with the strategic planning of ICT, greater institutional maturity is observed, with more integrated actions focused on impacting institutions and consequently society. Corroborating the above paragraph, the survey recorded a high percentage of implemented NIT, 98.5%, with only 2 NIT in implementation, equivalent to 1.5% of respondents. The Southeast region continues to have the largest number of participants, representing 33.8%, followed by the South with 23.1% of respondents and the Northeast with 22.3%. In organizational terms, 80% of NIT have internal planning, which demonstrates a certain level of maturity. This movement reflects the validation of actions undertaken by NIT, demonstrating their growing importance and impact within the ICT landscape. However, it is notable that only a smaller portion, equivalent to 23.8%, signed licensing agreements in the 2023 base year, while 22.3% reported generating financial revenues in 2023, which presents a challenge. In the context of patent filings, the scenario is more promising: in 2023, it was identified that 73% of participating NIT (95 respondents) had already gained experience with this type of action in patent or utility model protection, along with computer program registration, which reached 72% (94).

The new question regarding NIT resources revealed that for the vast majority (94.6%), funds come from the ICTs' own budgets, followed by projects with funding agencies (32.5%), and revenue generated from royalties and licensing (28.5%). Support foundations are also mentioned as a significant source (20.8%). The analysis highlights the need to diversify funding sources to ensure the sustainability of the Centers' activities

Another highlight is the focus on training and professional development. The participation of many NIT in programs like PROFNIT reflects a commitment to qualifying their collaborators, which is crucial for improving intellectual property (IP) management and technology transfer (TT). A noticeable inconsistency in the number of professionals, both with exclusive and partial dedication, is observed: the 2023 base year recorded a total of 1,506 professionals, 2022 counted 1,244, and 2021 totaled 1,573. Furthermore, for the second consecutive year, there was a slight decrease in the number of collaborators with partial dedication to NIT activities (2021: 749; 2022: 665; 2023: 592).

The increase in the number of IP protection applications (from 2,216 in 2022 to 2,638 in 2023) gains relevance when we consider that IP and its management represent the fundamental foundation of a NIT, serving as the primary base from which all other initiatives and actions of the Center unfold. This may reflect an incentive for intellectual protection or even an acceleration in research activities. Specifically, concerning patent applications filed in the 2023 base year, in the national phase in countries other than Brazil, with Brazilian origin priority, a total of 69 filings are observed, representing a decrease compared to the 2022 base year, which recorded 136 filings. Notably, this volume is concentrated in just 14 filing NIT, representing 10.8% of the total participants. This scenario results in an average of 5 filings per filing NIT among the 14 participants involved. The number of internationalization filings, via PCT, for patent applications, showed a decrease for the second consecutive year, totaling 50 filings. This phenomenon may be related to the lack of investments allocated for the international protection and maintenance of intellectual property by NIT and the lack of interest from licensing companies in national phase filings.

Another question included in 2023 concerned IP co-ownership, which found a higher incidence in co-owned filings with other Brazilian ICT, with 256 IPs under co-ownership, followed by 134 IP filings with companies only, 53 IPs filed under co-ownership with a Brazilian ICT and a company, and 51 IPs under co-ownership with foreign ICT and companies. These data highlight the importance of national collaborations. Co-ownership with foreign ICT was lower (10 IPs), indicating an opportunity to expand international partnerships.

Furthermore, the significant drop in revenue generated by licensing, from BRL 32 million in 2022 to BRL 13.6 million in 2023, points to possible failures in the commercialization and monetization process of these intellectual properties. The growth in the number of licensing agreements was not accompanied by a proportional increase in revenue, which may indicate challenges in commercialization, pricing, or access to appropriate markets. Regarding new licensing agreements formalized during the 2023 base year, know-how licensing led, with 134 new agreements signed. This was closely followed by patents or utility models, with a total of 53 agreements, and then computer programs with 34 formalized agreements. There were also 32 agreements related to cultivars, 12 involving trademarks, and 4 pertaining to biological materials. This shift in the landscape reflects the constantly evolving dynamics of technology transfer and intellectual property management. Among the 397 licensing agreements that generated financial revenue during the 2023 reference year, 69 of them, corresponding to 17% of the total, originated from collaborative projects. This reflects a discloulimited partnership with the external community but may indicate greater ease in licensing when companies are directly involved.

Only 23.8% of NIT signed licensing agreements in 2023, highlighting the difficulty in transforming intellectual property into concrete products, processes, and/or businesses. This may be related to issues such as insufficient infrastructure, lack of professionals specialized in negotiation and technology transfer, as well as difficulties in creating strategic partnerships with the private sector. The reduced number of NIT that formalized agreements emphasizes the need for a more in-depth analysis and prioritization of technology transfer activities.

Another concerning point is the regional inequality in the core activities of the Centers. The Southeast (with an average of 244.4 active IP applications and 17.9 active licensing agreements) continues to be the region with the largest participation and impact in NIT activities, while other regions show less representation. It is worth considering that the Southeast region also stands out in terms of average age, at 15.8 years, following the Center-West region at 14.9 years. The Northeast (average age 13) and North (average age 9.7) regions are the newest when considering average age. However, despite being new in terms of average age, the Northeast region ranks second with 170.2 in the average of active IPs. Regional inequalities may limit the development of new technologies in less favored areas, compromising the broader dissemination of innovation in the country. This requires public policies that encourage and support innovation in regions outside the Southeast axis.

The concentration of resources in a few NIT and the high costs of maintaining IP are challenges that need to be addressed to ensure the sustainability of NIT activities throughout Brazil.

Finally, this Report still shows that significant efforts are still needed for ICT to adequately implement their innovation policies. A point of concern regarding policies is the low percentage of regulations on minority participation in the equity capital of companies (0.8% implemented), but even other less complex issues are still far from being overcome by ICT.

Although the FORTEC Innovation Survey, base year 2023, shows notable advances in NIT capacity building and strategic planning, the report highlights the need for significant improvements in IP protection, IP commercialization, and the regional balance of innovation activities. These factors underscore the survey's fundamental role in identifying areas of weakness and gaps encountered by NIT, offering concrete data that can inform the formulation of public policies at regional or federal levels. Such policies aim to strengthen NIT and ICT, thereby expanding their contribution to innovation and their impact on Brazil's technological, economic, social, and sustainable development.

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