# TECHNOLOGIES AND HUMAN RIGHTS IN THE TRIPLE BORDER AREA


DataPrivacyBR Research

Technology & Human Rights

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## An exploratory study of the security programmes Muralha Inteligente (Brazil) and the Automated Migratory System for Facial Recognition (Paraguay)

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# CREDITS

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DataPrivacyBR Research

**Data Privacy Brasil Research Association** is dedicated to the interface between protection of personal data, technology and fundamental rights, producing research and advocacy actions before the Justice system, legislative bodies and government. Based on an Ethical Financing and Transparency Policy, the association carries out public interest research that seeks to reinforce the grammar of fundamental rights and expand the culture of personal data protection in Brazil and the Global South.

Tecnología & Derechos Humanos TEDIC

**TEDIC** is a Non-Governmental Organization founded in 2012 whose mission is to defend and promote human rights in the digital environment. Its main topics of interest are freedom of expression, privacy, access to knowledge and gender on the Internet.

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# EXECUTIVE SUMMARY

This report offers a characterization of two border security programmes located both in Brazil and Paraguay: Muralha Inteligente (Brazil) and the Automated Migratory System for Facial Recognition- SMARF (Paraguay) are two public security programmes that are part of a broader trend that seeks to digitize processes in the name of efficiency and optimization.

Muralha Inteligente is a programme with the goal of implementing, researching and developing intelligent technological solutions to better fight smuggling, embezzlement and trafficking of weapons and drugs on the Triple Border Area. Muralha Inteligente is one of the arms of a wider project called "Fronteira Tech", a border surveillance program that promotes the use of digital technologies with a focus on public safety.

The SMARF is a new migration control technology implemented by the Paraguayan government, which began in 2020. It consists of an automated mechanism of registration for people moving across borders based on facial recognition. It was initially deployed in the Triple Border Area and then moved to the Silvio Pettirossi International Airport.

Amongst the main findings of the research:

- There is a predominant efficiency and speed narrative in the deployment of digital technologies for border control. Such efficiency is an absolute value that tends to disregard an honest discussion to identify potential human rights risks violations and to mitigate them accordingly.
- Both programs do not develop Human Rights Impact Assessment (HRIA). In the case of the Muralha Inteligente programme there was no mapping of possible risks to human rights within the project. In the case of the SMARF, there is a confusion regarding the necessity of HRIAs since similar initiatives are already in place so there is a perception of a redundancy in implementing tools like this.
- Both programmes don't have privacy policies
- While some institutions in both countries answered the FOIAs requests in an exhaustive manner, there is still a component of lack of transparency that characterizes both researches. In the case of the Brazilian side, such justification sustains itself in the "national security deserves secrecy" argument. In the case of the Paraguayan side, there is a need to optimize the way in which public policies with a digital component can be traced at all times and not necessarily only under request of individuals interested in the matter.
- In relation to migration policies in the Paraguayan side with a digital component, there is an institutional will to develop an in- house biometric system to acquire independence in the maintenance of the current PIRS- MIDAS biometric system, a biometric migration system that is provided by the International Organisation for Migration.

# INTRODUCTION

Public security policies that employ technology to monitor borders are growing. Such a trend is particularly evident in the Triple Border Area (TBA), a strategic zone shared by Argentina, Brazil and Paraguay, due to the presence of one of the largest hydroelectric plants on the planet, a thriving economy based in the almost unrestrained circulation of people, goods and services, but also a difficult scenario in terms of criminality rates. To guarantee the area's security, the countries in the TBA have adopted a series of strategies in the last decade. For example, the Brazilian government bought highly intrusive drones of Israeli origin in 2013 as part of its security strategies for the Confederations Cup[1]. Likewise, Argentina bought and deployed similar technology on different borders of its territory[2]. The Paraguayan government has also deployed facial recognition technology to control migration flows between Paraguay and Brazil[3].

With this in mind, TEDIC and Data Privacy Brasil Research conducted research in 2021 to shed light on how public security institutions develop security and intelligence policies in the region. The object of the research was a thorough analysis of the Integrated Border Operations Center (CIOF), a Brazilian public security program whose objective is to combat transnational organized crime by integrating different public security agents' data to centralize information under one roof.[4] The underlying concern was the perception that this increasing technologization of public security programs combined with a lack of transparency of its implementation and operationalization (i.e. lack of accountability), increases the risks of state surveillance and violation of fundamental rights. However, CIOF is not the only security program in the area, which means more needs to be done in order to understand how the region adopts technology for security purposes, to determine what is the level of compliance with international human rights standards, as well as determine the current state of TBA countries' data sovereignty.

It is important to point out that the region has been under particular scrutiny since 2020 and after the USA terrorism annual report publication, which warned particularly about the presence of Hezbollah operatives in the TBA[5].

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1 Folha de São Paulo. FAB recebe dois novos aviões não tripulados para vigiar fronteiras. [Internet] Folha de São Paulo. 2022 [cited 2022 Dec 13]. Available from: https://www1.folha.uol.com.br/poder/2013/02/1232556-fab-recebe-dois-novos-avioes-nao-tripulados-para-vigiar-as-fronteiras.shtml

2 Agostini R. Inauguraron un sistema de control de fronteras apoyado con cámaras y drones. [Internet] La Nacion. 2022 [cited 2022 Dec 13]. Available from: https://www.lanacion.com.ar/seguridad/inauguraron-un-sistema-de-control-de-fronteras-apoyado-con-camaras-y-drones-nid2068981/

3 Agencia de Información Paraguaya. Más de 600 personas ya utilizaron el sistema de reconocimiento facial en el Puente de la Amistad. [Internet]. 2022 [cited 2022 Dec 13]. Available from: https://www.ip.gov.py/ip/mas-de-600-personas-ya-utilizaron-el-sistema-de-reconocimiento-facial-en-puente-de-la-amistad/

4 Carrillo E, Meira M, Secaf H, Zanatta Rafael. The Invisible Integration: an Integrated Border Operations Center's study. [Internet]. TEDIC & Data Privacy Brasil Research Association. 2021 [cited 2022 Dec 13]. Available from: https://www.tedic.org/wp-content/uploads/2022/02/CIOFTEDICDPrivacy_report.pdf

5 ABC. EE.UU. alerta sobre operativos del grupo Hezbollah en el Triple Frontera. [Internet]. 2020 [cited 2022 Dec 13]. Available from: https://www.abc.com.py/edicion-impresa/internacionales/2020/06/25/eeuu-alerta-sobre-operativos-del-grupo-hezbollah-en-la-triple-frontera/.

From this scenario, TEDIC and Data Privacy propose an expansion of last year's project, now focusing on new security and technology programmes in the region and the risks and opportunities they pose for human rights. Particular attention will be given to better characterise two security programmes and the narratives surrounding them, as well as determine the actual usefulness of the programmes for the objectives they seek to fulfil: Muralha Inteligente (Brazil) and SMARF (Paraguay).Such focus is an expansion of preliminary findings in the CIOF research, that allows to map security programmes linked directly or indirectly to CIOF.

Based on the above, the current research seeks to better understand and shed a light on both programs, especially regarding the understanding of which technologies are used and their implications for human rights compliance in the Triple Border Area. Based on a literature review, Freedom of Access to Information requests (FOIA) and interviews, this report maps the findings about these two security programs within a year of research.

# METHODOLOGICAL FRAMEWORK

The methodological review consisted in a number of data collection processes to collect information regarding the subject of study. Concretely, three processes were put in place:

- One documentary review to access information about the Smarf and Muralha Inteligente programmes, as well as the broader technology, public security, surveillance and privacy landscape in the Latin American region for the past three years.
- A number of FOIA requests to access specific information regarding both the Smarf and Muralha Inteligente, and based on missing gaps from the documentary review stage.
- Interviews with public official institutions to access additional information not available in the two other stages.

## DOCUMENTARY REVIEW

### Search question

In search of a clear, unambiguous and structured process to guide the documentary review (DR), the following question was designed: ***What is the knowledge production of digital rights organizations in Latin America and regarding the deployment of artificial intelligence surveillance technologies in the public space?***

### Search Strategy

The researchers propose a selection of three open information sources. This to access information related to the search question, and more importantly, all the available information regarding the Smarf and Muralha Inteligente programmes.

To characterize the topic from a global south perspective, particularly from Latin America, the researchers selected 12 organizations from the international Privacy International network. As well as Rede Latino-Americana de Estudos sobre Vigilância, Tecnologia e Sociedade (Lavits), which is a research network aimed at developing discussions around themes related to surveillance, technopolitics and society. Table 1 shows the Civil Society Organizations (CSOs) sources that were consulted.

**TABLE 1**

| Civil society database | |
|---|---|
| **Paraguay** | **Brazil** |
| Asociación por los Derechos Civiles | Coding Rights |
| Dejusticia | InternetLab |
| Derechos Digitales | Data Privacy Brasil |
| Fundación Karisma | Hiperderecho |
| R3D | IPANDETEC |
| TEDIC | Lavits |

A combination of keywords was produced to filter the necessary information from such repositories. A different set of keywords was developed to consult the CSO's databases and the government institutions related to the Smarf and Muralha Inteligente programmes, as well as mainstream news outlets that cover security news in general. Table 2 provides an overview of such words for each of the targeted sources.

**TABLE 2**

| Keywords | Alternative keywords |
|---|---|
| **For Civil society database consultation** | |
| Surveillance technology | Facial recognition, Artificial intelligence, AI, drones, cameras, algorithm(s) |
| Security | |
| Privacy and data protection | Personal data, personal data protection, data, (data) privacy, data integration |
| **For documentary review in news outlets and public institutions websites** | |
| Muralha Inteligente | Border crime, Triple Border, Artificial Intelligence, Technology, Monitoring, Algorithms, Fronteira Tech, Tech, Smart cities |
| Sistema Migratorio Automatizado de Reconocimiento Facial | Facial recognition, Artificial Intelligence, AI, biometrics, Triple Border, Ciudad del Este, Foz de Iguazú, International Bridge of Friendship, Self-boarding, Automated People Registration |

A total of 14 public institutions and 8 news outlets were consulted. Table 3 provides an overview of which institutions and public outlets were consulted.

**TABLE 3**

| Public institutions database | |
|---|---|
| **Paraguay** | **Brazil** |
| Ministry of Interior<br>National Directorate of Migration<br>National Police<br>Ministry of Technology and Communications<br>Public Ministry<br>Access to public information portal | Ministério da Justiça e Segurança Pública<br>Parque Tecnológico Itaipu (PTI)<br>Polícia Federal<br>ABIN<br>Ministério das Relações Exteriores<br>Ministério Público<br>Agência Brasileira de Desenvolvimento Industrial (ABDI)<br>Receita Federal |
| **News & Media outlets** | |
| **Paraguay** | **Brazil** |
| La Nación<br>Ultima Hora<br>ABC Color<br>Agencia IP | Folha de São Paulo<br>The Intercept Brasil<br>Agência Pública<br>G1 |

The main criteria to select the information was that such research was published up to three years previous to the conduction of the DR. In the case of news outlets and government institutions websites, the researchers decided to document and analyze only information useful to characterize both the Smarf and Muralha Inteligente programmes. A total of 113 useful materials[6]. documents were reviewed in the Brazilian case and 89 in the Paraguayan case.

6 7 Research Projects; 17 Research Reports; 52 Articles/ News / Press releases / Interviews; 5 Books Collection of articles; 21 Advocacy material and 11 Audiovisual material (webinars, participation in events, documentaries, etc.).

## FREEDOM OF ACCESS TO INFORMATION REQUESTS

To access more specific information about the Smarf and Muralha Inteligente programmes, and based on the preliminary findings from the DR, a number of FOIAs were designed and sent to different public institutions. Table 4 gives an overview of what institutions were consulted

| FOIA requests | |
|---|---|
| **Paraguay** | **Brazil** |
| General Direction of Migration<br>Technological Park of Itaipú (Paraguayan side) | Brazilian Federal Revenue<br>Ministry of Economy<br>Technological Park of Itaipu (Brazilian side)<br>Itaipu (Brazilian side) |

A total of 4 requests were made on the Brazilian side and 3 requests on the Paraguayan side.

## INTERVIEWS

The final data collection stage involved a stakeholder mapping based on both the documentary review and the FOIA requests. Such a process aimed at closing the informational gaps from both the documentary review and FOIAs data collection stages. A total of 3 interviews were conducted. One interview was made with a representative from the Parque Tecnologico de Itaipu (PTI) - Brazilian side. Two interviews were made with representatives of the National Directorate of Migration (DGM by its Spanish acronym) in Paraguay from the programmatic and IT departments. All interviews were conducted anonimously.

It is important to point out that the Brazilian side was only able to conduct one interview, although more interviews with other institutions could have been useful. This is because representatives from PTI stated it would not be possible to conduct an interview with a team member, since "[...] the discussion and disclosure of specific data and information regarding the project and its objects is prohibited by confidentiality clauses contained in the contracts with the other project participants. - although the questions that were to be asked were not disclosed before the interview request. Also, the research also reached out to servers from the Brazilian Federal Revenue (RFB, Brazilian acronym), but there was no answer.

# DOCUMENTARY REVIEW

## BIOMETRIC TECHNOLOGY & SURVEILLANCE DEBATE

The use of facial recognition technologies (FRT) implies a very sophisticated debate over surveillance. The FRT refers to a "technology that matches captured images with other facial images held, for example, in databases or "watchlists" (...)"[7]. Fundamentally, these technologies rely on the exploitation of a person's facial biometrics, and they can be used to authenticate and to profile an individual[8].

The debate about surveillance resulting from the implementation of these technologies goes through some relevant elements, such as the discussions related to mass surveillance and to practices that can result in algorithmic racism. It is comprehended that surveillance activities over individuals or human population have three core elements: observation, knowledge and intervention[9]. The observation element can be carried out in different ways, and involves the regular, systematic and focused inspection of individuals, populations, etc., which must allow production of knowledge about those who are being watched; such knowledge can be formalized in various ways, such as extraction of patterns[10].

To be characterized as a surveillance practice, it must have the perspective of intervening on individuals or populations. Such intervention is understood as the art of steering behavior[11]. In general terms, surveillance can be defined as "(...) the systematic and focused observation of individuals, populations, or information concerning them, with a view to producing knowledge and intervening on them in order to steer their conduct"[12].

When it comes to the implementation of FRT in public security matters, these technologies have been used to identify criminal suspects. In this sense, they can be characterised as a surveillance practice, considering the perspective of intervening directly on individuals' behaviours. In this landscape, these discussions are focused on a thin line between the development of public security and the restriction of the freedom and the privacy of citizens, remaining questions on whether such FRT are efficient or not[13].

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7 Privacy International. Facial Recognition [Internet]. Privacy International. N.d. [cited 2022 Dec 11]. Available from: https://privacyinternational.org/learn/facial-recognition

8 Ibidem.

9 Bruno F. Máquinas de ver, modos de ser: vigilância, tecnologia e subjetividade. Porto Alegre: Editora Sulina, 2013, 190p. [cited 2022 Dec 11]. Available from: https://comunicacaoeidentidades.files.wordpress.com/2014/07/pg-18-a-51-maquinas-de-ver-modos-de-ser.pdf

10 Ibidem.

11 Ibidem.

12 Ibidem, p. 18.

13 Silva VH. Por que o uso de reconhecimento facial na segurança é controverso? [INTERNET] Tecnoblog. N.d. [cited 2022 Dec 11]. Available from: https://tecnoblog.net/especiais/por-que-o-uso-de-reconhecimento-facial-na-seguranca-e-controverso/

The documentary review has given substantial information documented by civil society organizations from the Privacy International network and others that deal or have dealt with the use of biometrics technology in different contexts. For this year's report, several case studies have been selected to reflect different technology usesd in Latin American countries and to build a story regarding such a topic.

## STRATEGIC LITIGATION CASES

Strategic litigation is a tool that has been used across the region to resist initiatives that entail the deployment of FRT in the public space. Such has been particularly the case in capitals across Latin America, with similar arguments used across them.

### Strategic litigation in Asunción

The organisation TEDIC has filed an action of unconstitutionality against a resolution of the Ministry of Interior (MI), and a series of judicial resolutions that emerged to validate the Ministry, and in response to a request for access to public information from TEDIC. The request solicited details on the biometric technology system that the MI and the National Police have been implementing since July 2018. The Ministry of Interior's response was limited: It did not provide information on the details of implementation, protocols and any processing of personal data used in the facial recognition system, the purpose of the system, whether the error rates of the algorithm used by the software was ever evaluated, and whether there were human rights impact assessments before deploying the system[14].

According to the MI, the main reason to deny the information was that it was considered classified. This is unfounded, as the law clearly states that for information to be classified, it must be expressly established by law[15].

For the organisation TEDIC, it is worrying that state bodies use legal norms at their convenience and depending on the case. It is even more serious that judges, who are supposed to ensure compliance with the law, legitimize this behaviour. The process is still open and awaiting a response from the judicial authorities.

### Strategic litigation in Buenos Aires

In response to the deployment of a System for Facial Recognition of Fugitives (SRFP by its Spanish acronym) in the city of Buenos Aires, the Association for Civil Rights filed an unconstitutionality action against the Government of such a city[16]. Such system uses facial recognition

14 TEDIC. ¿Quién vigila al vigilante? Reconocimiento Facial en Asunción [Internet]. TEDIC. 2019 [cited 2022 Dec 11]. Available from: https://www.tedic.org/quien-vigila-al-vigilante-reconocimiento-facial-en-asuncion/

15 Ibidem.

16 ADC. El reconocimiento facial para vigilancia no pertenece a nuestro espacio público [Internet]. Asociación por los Derechos Civiles. 2019 [cited 2022 Dec 11]. Available from: https://adc.org.ar/2019/11/06/el-reconocimiento-facial-para-vigilancia-no-pertenece-a-nuestro-espacio-publico/

technologies to identify fugitives and based on live images obtained by video cameras installed on public roads. The system compares the live images with photos of persons wanted by the judiciary[17].

Amongst the main arguments in the action, the ADC points that facial recognition, when applied for police surveillance purposes, becomes a disproportionate technology that, in addition to not having the appropriate legal basis, seriously affects the constitutional rights and guarantees of all people living in the city[18].

Notably, this year, a Buenos Aires judge ordered the suspension of the SRFP. This measure is in response to a collective injunction filed by the Observatorio de Derecho Informático Argentino (O.D.I.A.) against the Government of the Autonomous City of Buenos Aires. Between the main reasons of the judge for justifying the suspension, there are concerns around the system undermining the rights to privacy, honour, image, identity, privacy, information, citizen participation and the principle of innocence[19].

**Strategic litigation in the city of São Paulo**

A Public Civic Action (ACP) was filed by the Public Defender's Office of the State of São Paulo (DPESP), the Public Defender's Office of the Union (DPU), the Brazilian Consumer Defense Institute (IDEC), Intervozes - Coletivo Brasil de Comunicação Social (Intervozes), and Article 19 Brazil (Article 19), against the São Paulo Metropolitan Company, due to the adoption of facial recognition technologies by the São Paulo subway system.

This ACP is a result of the analysis of a series of documents presented by the Metro São Paulo, in a former lawsuit, which began in 2020. The same organizations requested more information about data security, and data processing of the personal data collected by ViaQuatro, one of the concessionaires of the city of São Paulo's subway system.

The ACP requested the immediate suspension of the capturing and processing of biometric data of subway users with the imposition of a daily fine for non-compliance. In the end, it required the prohibition of the use of facial recognition technologies within the subway's dependencies, in addition to the payment of compensation for collective moral damages in the amount of more than 42 million reais, due to illegal personal data processing[20].

17 Chequeado. Por qué se suspendió el sistema de reconocimiento facial de la Ciudad de Buenos Aires [Internet]. Chequeado. 2022 [cited 2022 Dec 11]. Available from: https://chequeado.com/el-explicador/porque-se-suspendio-el-sistema-de-reconocimiento-facial-de-la-ciudad-de-buenos-aires/

18 ADC. El reconocimiento facial para vigilancia no pertenece a nuestro espacio público [Internet]. Asociación por los Derechos Civiles. 2019 [cited 2022 Dec 11]. Available from: https://adc.org.ar/2019/11/06/el-reconocimiento-facial-para-vigilancia-no-pertenece-a-nuestro-espacio-publico/

19 Arroyo V. Buenos Aires y São Paulo suspenden el reconocimiento facial [Internet]. Access Now. 2022 [cited 2022 Dec 11]. Available from: https://www.accessnow.org/buenos-aires-y-sao-paulo-suspenden-reconocimiento-facial/

20 Butcher I. Entidades entram na justiça contra coleta de dados biométricos pelo Metrô de São Paulo. [Internet]. Mobile Time. 2022 [cited 2022 Dec 11]. Available from: https://www.mobiletime.com.br/noticias/03/03/2022/entidades-entram-na-justica-para-impedir-que-metro-de-sao-paulo-continue-com-coleta-de-dados-biometricos-de-usuarios/.

## BRAZILIAN CAMPAIGNS LED BY CSOS

Campaigns have been used as tools by CSOs as means to resist initiatives that implement FRTs in public spaces. The purpose of these campaigns is to mobilize citizens, based on the exposure of the risks inherent to such technologies, as well as to serve as a tool to pressure public authorities, in face of public policies that aim at the implementation of FRTs.

**#SaiDaMinhaCara:** is an initiative led by MediaLab.UFRJ, Rede Lavits, Coding Rights, O Panóptico and Idec, following the international trend of banning facial recognition technologies in public spaces. This initiative was designed as a protocol, in which the aforementioned organizations carried out advocacy strategies with parliamentarians from the entire country's legislature, so they all filed bills, simultaneously, to ban facial recognition. More than 50 parliamentarians, from several different parties, showed support and filed projects. The next step is the processing and approval of these projects, so the articulation continues[21].

The main argument revolving around this campaign criticizes the implementation of FRTs in public spaces, even if working optimally, because it would still be a technology used as a mass surveillance tool in public spaces. In this sense, the FRTs would invert the presumption of innocence, assuming that every individual would be considered a suspect, subjected to filming, monitoring and would be, possibly, identified without their consent[22] (O Panóptico, n.d.).

**Take My Face Out of Your Target**[23]: the project is an initiative of the Coalizão Direitos na Rede and seeks to bring more clarity about the problems that facial recognition brings to public safety. The main objective of the campaign is  the total banning of FRTs in Brazilian Public Security, given the evidence of its abusive use and little transparency.

The arguments are, in a nutshell, that the ability to individually identify and track people undermines rights such as privacy and data protection, freedom of expression and assembly, equality and non-discrimination. The open letter also foresees the necessity of publishing impact assessments on the use of these technologies, covering the period from when they were first designed to when they were discontinued, including information on public expenditures and on the supposed efficiency of such technologies, as well as documentation of all procedures implemented, risks to data subjects and the subsequent risk mitigation strategies[24].

21 Amado G, Ghirotto E. Proibição do reconhecimento facial une 50 parlamentares em 15 estados. [Internet]. Metrópoles. 2022 [cited 2022 Dec 11]. Available from: https://www.metropoles.com/colunas/guilherme-amado/proibicao-do-reconhecimento-facial-une-50-parlamentares-em-15-estados.

22 O Panóptico. Projetos de lei em todo Brasil pedem o banimento do reconhecimento facial em espaços públicos. [Internet]. 2022 [cited 2022 Dec 11]. Available from: https://opanoptico.com.br/projetos-de-lei-em-todo-brasil-pedem-o-banimento-do-reconhecimento-facial-em-espacos-publicos/.

23 To learn more, visit: https://tiremeurostodasuamira.org.br/en/home-eng/.

24 Tire meu rosto da sua mira. Open letter to ban the use of digital facial recognition technologies in public security. [Internet]. 2022 [cited 2022 Dec 11]. Available from: https://tiremeurostodasuamira.org.br/en/open-letter/.

**"No Camera in My Face"**: The city of Recife, in a public-private partnership, intends to carry out an experiment by installing 108 facial recognition cameras throughout the city. These cameras are part of urban furniture structures, such as clocks and traffic monitoring machines. This experiment has a cost of millions of reais that come straight out of the tax contribution from citizens.[25] Faced with this situation and aware of the risks that facial recognition technologies pose to citizens, organizations such as IP.Rec, Criminal Justice Network, Lavits Network, Black Articulation of Pernambuco, Order of Attorneys of Brazil (OAB) - Pernambuco, Popular Center for Human Rights and Natrape joined the Meu Recife network and launched the campaign "Sem Câmera na Minha Cara"[26], which has already sent more than 700 emails to Mayor João Campos to stop the installation of the camera. An open letter was also released, in which the risks of facial recognition in public spaces are described[27].

The campaign sheds light to the risks associated with the implementation of FRT in public spaces. It is outlined that such technology could result in violations such as racism, transphobia, persecution and harassment of activists and social movements, and violations related to privacy and data protection[28].

25 Câmara Municipal de Recife. Câmeras de reconhecimento facial são tema de audiência na Câmara. [Internet]. 2022 [cited 2022 Dec 11]. Available from: https://www.recife.pe.leg.br/comunicacao/noticias/2022/03/cameras-de-reconhecimento-facial-sao-tema-de-audiencia-na-camara.

26 To learn more, visit: https://www.semcameranaminhacara.meurecife.org.br.

27 IP.REC. Carta Aberta: Política de reconhecimento facial da PCR ameaça direitos de todos os cidadãos e cidadãs. Instituto de Pesquisa em Direito e Tecnologia do Recife. [Internet]. 2022 [cited 2022 Dec 11]. Available from: https://ip.rec.br/blog/carta-aberta-politica-de-reconhecimento-facial-da-pcr-ameaca-direitos-de-todos-os-cidadaos-e-cidadas/.

28 Sem Câmera na Minha Cara. Página Inicial. [Internet]. n.d. [cited 2022 Dec 13]. Available from: https://www.semcameranaminhacara.meurecife.org.br.

## USE OF BIOMETRICS TECHNOLOGIES IN BORDER AND MIGRATION CONTEXTS

### Colombia and the Venezuelan migration

The Colombian context offers a particular case study at the intersection of biometrics technologies and migration. Due to a high influx of Venezuelan migrants in the country, in 2021 it was created a Temporary Protection Statute for migrants and refugees from Venezuela to regularise their migratory situation. One of the objectives of the Statute was to create a transitional regime to allow them to move from a temporary protection regime to the ordinary migration regime and eventually apply for a resident visa[29].

However, CSOs such as De Justicia and Fundación Karisma, warned that there were problematic provisions in the policy that could violate the fundamental rights of Venezuelan migrants, such as the mandatory provision of biometric data[30]. It is important to point out that, in general, the public discourse in Colombia strongly supports the implementation of biometrics technologies – such as facial recognition technology – in almost every aspect of life[31].

Such CSOs recommended that requiring biometric sensible data was not necessary and that making it mandatory was incompatible with the rights to habeas data and non-discrimination. The CSOs recommended abandoning this pre-requisite to grant the temporary protection statute. However, the government kept the biometric data requirement[32].

This execution of the policy is also something interesting to reflect upon. De Justicia has pointed to specific issues, which are difficult to ignore when thinking about the impact of these technologies in the context of vulnerable communities. First, the provision of biometric data – including fingerprints, facial features, iris, among others – is not voluntary because to register and access to the statute, migrants must provide this data. Making access to a benefit conditional on the provision of biometric data affects people's freedom of choice[33].

Second, such a requirement implies a discriminatory treatment of the Venezuelan migrant population. This particularly since biometric data is required neither for Colombians nor for migrants of other nationalities[34].

29 De Justicia FK. Lo que no puede quedar por fuera del Estatuto Temporal de Protección para personas migrantes venezolanas [Internet]. Dejusticia. 2021 [cited 2022 Dec 11]. Available from: https://www.dejusticia.org/lo-que-no-puede-quedar-por-fuera-del-estatuto-temporal-de-proteccion-para-personas-migrantes-venezolanas/

30 Ibidem

31 International Network of Civil Liberties Organisations. In focus: Facial recognition tech stories and rights harms from around the world [Internet]. 2021 [cited 2022 Dec 11]. Available from: https://www.inclo.net/pdf/in-focus-facial-recognition-tech-stories.pdf

32 Arroyave L. Migración y datos biométricos: una peligrosa mezcla del Estatuto de protección [Internet]. Dejusticia. [cited 2022 Dec 11]. Available from: https://www.dejusticia.org/column/migracion-y-datos-biometricos-una-peligrosa-mezcla-del-estatuto-de-proteccion/.

33 Ibidem.

34 Ibidem.

Lastly, and in the context of a new government in place in Colombia, different CSOs and academics have developed a document with recommendations for a migration agenda. Point five of the document particularly stands out since it calls to establish respectful measures for the use of the data of the migrant and refugee population. Concretely, they call for migration authorities to rethink the collection and use of biometric data of migrant and refugee populations. A particular reflection on the impossibility of such communities to freely grant consent when giving their sensitive data is posed[35].

**Muralha Inteligente**

Muralha Inteligente is an agreement signed between Itaipu Binacional, the Brazilian Federal Revenue and PTI-BR, in December 2020, with the goal of implementing, researching and developing intelligent technological solutions to better fight smuggling, embezzlement and trafficking of weapons and drugs on the Triple Border Area (Brazil, Argentina and Paraguay)[36]. Itaipu Binacional invested R$ 18,847,849.52 for the purchase of equipment and the Federal Revenue has invested R$ 1,064,617.84[37].

The literature review enabled the findings that Muralha Inteligente is one of the many projects envisioned and launched by PTI which belong to a bigger picture of governmental projects that aim to increase the employment of technology in sectors related to public security, traffic and energy. Muralha Inteligente is one of the arms of a wider project called "Fronteira Tech", a border surveillance program that monitors the Ponte da Amizade operationalized by the Brazilian Agency for Industrial Development (ABDI), an agency of the Ministry of Economy with the same overall goal of combating smuggling and embezzlement in the region. It involves also the Brazilian Federal Revenue and the Institute for Technological Development (INDT)[38]. It is operationalized in an integrated way with the Federal Revenue database and reinforces customs control at the Ponte da Amizade, in Foz do Iguaçu (PR), on the border between Brazil and Paraguay.[39]

35 Fundación Karisma. Recomendaciones para la agenda migratoria del nuevo gobierno [Internet]. 2022 [cited 2022 Dec 11]. Available from: https://web.karisma.org.co/recomendaciones-para-la-agenda-migratoria-del-nuevo-gobierno-2/

36 PTI. PTI promove treinamento de drones para Receita Federal. [Internet]. 2021 [cited 2022 Dec 13]. Available from: https://www.pti.org.br/pti-promove-treinamento-de-drones-para-receita-federal/.

37 Rede Comunicadora Iguaçu. Projeto Muralha Inteligente terá drones e tecnologia de última geração para monitoramento da fronteira. [Internet]. 2020 [cited 2022 Dec 13]. Available from: http://semprerci.com.br/2020/12/muralha-inteligente-itaipu-vai-investir-r-19-milhoes-em-tecnologia-para-seguranca-da-fronteira/.

38 Apart from being a private company, INDT's role in the project is to enable the use of IoT technologies, with a focus on artificial intelligence, aimed at public and private security, generating greater effectiveness in controlling the entry and exit of people, goods and vehicles at Customs at Ponte da Amizade. Associação Data Privacy Brasil de Pesquisa. Solicitação de acesso à informação pública ao Ministério da Economia sobre o projeto Muralha Inteligente [Internet]. 2022 [cited 2022 Dec 10]. It was chosen by ABDI, which was responsible for providing the resources needed. Associação Data Privacy Brasil de Pesquisa. Solicitação de acesso à informação pública ao Ministério da Economia sobre o projeto Muralha Inteligente [Internet]. 2022 [cited 2022 Dec 10].

39 ABDI, Ponte da Amizade ganha sistema de monitoramento inteligente. Projeto entre ABDI, Receita Federal e INDT vai melhorar o controle da fronteira entre o Brasil e o Paraguai com o uso de tecnologias de reconhecimento facial e de placas de automóveis, Inteligência Artificial, IoT e Big Data. CCOM. 2019. [cited 2022 Dec 11]. Available at: https://www.abdi.com.br/postagem/ponte-da-amizade-ganha-sistema-de-monitoramento-inteligente

Fronteira Tech promotes the use of digital technologies with a focus on public safety and which have been tested and validated at ABDI's and PTI's Live Laboratory for Smart Cities[40]. It is interesting to note that it was launched very closely to the Integrated Center of Border Operations (CIOF)[41] - and similar personnel were present at the launching event. For instance, Sergio Moro, the then Minister of Justice and Public Security, which, making a reference to CIOF, clarified that Fronteira Tech "[...] represents another important aspect of border control. While in the morning we were talking about integration, here it is about technology at the service of border control"[42].

The technology employed in Fronteira Tech consists of 33 intelligent light fixtures, with two cameras in each one of them, totaling 66 pieces of equipment capable of facial recognition and identifying license plates. There are also four cameras with the same technologies fixed strategic points; 15 LED lights with telemanagement and GPS and 11 shot sensors integrating the system[43]. The use of high-definition cameras to monitor the border generates information in real time and is controlled by an operations center, impacting on the custom service[44].

Muralha Inteligente's mains acquisition are drones that fly over the border - including the water part - 24 hours a day, on the border with Argentina[45]. As one of the project's actions, the PTI promoted drone piloting training for Federal Revenue agents, which took place at the RFB headquarters in Foz do Iguaçu, in April 2021. PTI had already carried out training for: military police, federal police, civilians; army officers, which hints on its competence in the area of unmanned aerial vehicles[46]. According to the available information, it also employs high-definition cameras (which are linked to artificial intelligence software that identifies patterns and generates data to help with customs control of the Ponte da Amizade)[47] and license plate recognition cameras at strategic points[48].

40 Ibidem: Living Lab was launched in January 2019 in partnership between ABDI and the Itaipu Technological Park (PTI). The Living Lab was set up to demonstrate and evaluate solutions for Smart Cities.

41 Carrillo E, Meira M, Secaf H, Zanatta Rafael. The Invisible Integration: an Integrated Border Operations Center's study. [Internet]. TEDIC & Data Privacy Brasil Research Association. 2021 [cited 2022 Dec 13]. Available from: https://www.tedic.org/wp-content/uploads/2022/02/CIOFTEDICDPrivacy_report.pdf

42 ABDI, Ponte da Amizade ganha sistema de monitoramento inteligente. Projeto entre ABDI, Receita Federal e INDT vai melhorar o controle da fronteira entre o Brasil e o Paraguai com o uso de tecnologias de reconhecimento facial e de placas de automóveis, Inteligência Artificial, IoT e Big Data. CCOM. 2019. [cited 2022 Dec 11]. Available at: https://www.abdi.com.br/postagem/ponte-da-amizade-ganha-sistema-de-monitoramento-inteligente

43 Ibidem.

44 Ibidem.

45 Rede Comunicadora Iguaçu. Projeto Muralha Inteligente terá drones e tecnologia de última geração para monitoramento da fronteira. [Internet]. 2020 [cited 2022 Dec 13]. Available from: http://semprerci.com.br/2020/12/muralha-inteligente-itaipu-vai-investir-r-19-milhoes-em-tecnologia-para-seguranca-da-fronteira/.

46 PTI. PTI promove treinamento de drones para Receita Federal. [Internet]. 2021 [cited 2022 Dec 13]. Available from: https://www.pti.org.br/pti-promove-treinamento-de-drones-para-receita-federal/.

47 Although the FOIAs do not corroborate with this information, as will be seen later on.

48 Rede Comunicadora Iguaçu. Projeto Muralha Inteligente terá drones e tecnologia de última geração para monitoramento da fronteira. [Internet]. 2020 [cited 2022 Dec 13]. Available from: http://semprerci.com.br/2020/12/muralha-inteligente-itaipu-vai-investir-r-19-milhoes-em-tecnologia-para-seguranca-da-fronteira/.

According to PTI's superintendent director, General Eduardo Garrido, these new technologies will help improve agility and assertiveness in the fight against cross-border crimes[49]. It has also been mentioned that the project is strategic not only due to the technologies employed, but because success of this model of action could be expanded to the other border units of the RFB[50].

**Automated Migratory System for Facial Recognition (SMARF) and In-house biometric system**

The SMARF is a new migration control technology implemented by the Paraguayan government, which began in 2020. It consists of an automated mechanism of registration for people moving across borders based on facial recognition.

In a management report, the DGM mentions that the SMARF is part of a pilot plan to gradually register people who move through the International Friendship Bridge. Such a system is aimed at national citizens and resident foreigners travelling with an identity document and non-resident foreigners travelling across the border with their identity document under the modality of Border Neighborhood Transit (TVF by its Spanish acronym)[51].

The system consists of four biometric identification terminals (TIB) for pedestrian use with facial recognition and machine-readable travel documents; a thermal printer for tickets and entry vouchers; two mobile devices with an application for manual reading of QR codes and facial recognition with connectivity; four turnstiles integrated to the terminals for automatic opening; server and networking equipment, adaptation of the terminals with signage protection structure, enclosures, etc.; technical service for support and maintenance for twelve months[52]. The project cost a total of 1.495.000.000 guaraníes.

Amongst its main benefits, the DGM cites:

- Automation of people registration (self-boarding)
- More accurate biometric data capture, including facial recognition.
- Digitization and traceability of migratory information.
- Integration with the database of the National Police -Identification Department, the National Police database of wanted persons and the local migration database.
- Streamlining processes and optimising resources
- Reduced exposure to human contact following COVID-19 health protocol[53].

49 PTI. PTI promove treinamento de drones para Receita Federal. [Internet]. 2021 [cited 2022 Dec 13]. Available from: https://www.pti.org.br/pti-promove-treinamento-de-drones-para-receita-federal/.

50 Ibidem.

51 Dirección General de Migraciones. Migraciones presenta Informe de Gestión 2020 :: Migraciones [Internet]. 2021 [cited 2022 Dec 9]. Available from: https://www.migraciones.gov.py/index.php/noticias/migraciones-presenta-informe-de-gestion-2020

52 Ibídem.

53 Ibídem.

Since its implementation in 2020, numerous media outlets have given an account of the implementation of such a system. Concretely, news document a progressive self-registration of people crossing the International Friendship Bridge. After one month of implementing the policy, more than 1000 people used it[54]. This escalated to more than 4000 people in less than two months[55].

Public available information also evidenced some problems regarding the implementation of the SMARF system. Less than a month after the system was inaugurated, it went down due to technical problems, with the added problem that only two specialised staff members could maintain the technology. Moreover, although it could be argued that there was initial enthusiasm for the self-boarding nature of the SMARF, news also documented that from the total of people who used the system when entering Paraguay, only 20% used the system when leaving and that there was some initial resistance from people[56]. No explanation on the why of the resistance was found.

More importantly, from the beginning, the DGM mentioned that the next stage of the policy would entail replicating SMARF in the Silvio Pettirossi International Airport and other border areas[57]. However, a few months after the policy was implemented in the Triple Border Area, the four SMARF terminals were transferred from the Friendship Bridge to the airport, under the argument that there wasn't enough structure in the TBA for its full implementation as well as the lack of a unified database[58]. Two out of four TIBS are fully working in the airport since the end of September 2022[59]. The system has an introductory video to explain to users how to self-register. However, there is no reference to how the data is collected nor information of how long it will be stored.

54 La Nación. Más de mil personas ya usaron el sistema de reconocimiento facial en Puente de la Amistad. 2021 [cited 2022 Dec 9]; Available from: https://www.lanacion.com.py/pais/2021/01/07/mas-de-mil-personas-ya-usaron-el-sistema-de-reconocimiento-facial-en-puente-de-la-amistad/

55 López K. Sistema de reconocimiento facial en el Puente de la Amistad ya enroló a más de 4.000 personas. .::Agencia IP:: [Internet]. 2021 Jan 29 [cited 2022 Dec 9]; Available from: https://www.ip.gov.py/ip/mas-de-4-000-personas-enroladas-al-sistema-de-reconocimiento-facial-en-el-puente-de-la-amistad/

56 La Nación. Visitantes no registran salida por control Smarf. 2021 [cited 2022 Dec 9]; Available from: https://www.lanacion.com.py/pais_edicion_impresa/2021/01/12/visitantes-no-registran-salida-por-control-smarf/

57 5 Días. Millonaria inversión para control. 2021 [cited 2022 Dec 9]; Available from: https://issuu.com/editorialdenegocios.com/docs/5dias28dic

58 La Clave. Cooperación y seguridad fronteriza en agenda de diplomática estadounidense. La Clave [Internet]. 2022 Sep 8 [cited 2022 Dec 9]; Available from: https://www.laclave.com.py/2022/09/08/cooperacion-y-seguridad-fronteriza-en-agenda-de-diplomatica-estadounidense/.

59 Dirección General de Migraciones. Migraciones habilitó dos terminales biométricas de auto registro migratorio para agilizar la entrada de nacionales en el aeropuerto :: Migraciones [Internet]. 2022 [cited 2022 Dec 9]. Available from: https://www.migraciones.gov.py/index.php/noticias/migraciones-habilito-dos-terminales-biometricas-de-auto-registro-migratorio-para-agilizar-la-entrada-de-nacionales-en-el-aeropue

Moreover, it would seem that such an experience later did inform subsequent policies related to facial recognition technologies at borders. Within the framework of a U.S. cooperation visit in the TBA, and after the SMARF system was transferred to the airport, the head of the DGM mentioned that when thinking about deploying both facial and vehicle plaque recognition technologies:

> For facial and license plate recognition to be possible, there must be a joint database, with which to compare. Buying equipment for the sake of buying it will not be useful because we have to work first on the unification of the database[60].

The above could also be linked with how the DGM is considering issues of personal data protection. Concretely, this year, an international event was held, with representatives from the Triple Border Area that met to discuss the necessity of harmonizing existing legal frameworks to enable an exchange of information through systems that provide for appropriate processing of personal data collected and shared between States. In such event, representatives from Paraguay pointed to new migration law that was put in forced and with specific reference to privacy provisions:

> In order to safeguard the inviolability of personal and family privacy and respect for the private life of individuals, as enshrined in the Constitution, the National Directorate of Migration shall preserve the confidentiality of information relating to migrants recorded in its documents and databases. It may only be disclosed by court order for cases specifically provided for in the Law, and provided that they are essential for the clarification of matters within the competence of the relevant authorities[61].

More importantly, the expansion or resignification of how biometrics technologies are used -or planned to be used- in migration policies persists. A 2021 management report from the DGM enlisted several achievements for such a year. Although there is no mention of the SMARF system, such a report mentions the development of a project to obtain an in-house migration system based on biometric technologies inspired by a similar system based in Perú. The report also mentions a strategic partnership with the Itaipu's Technological Park- Paraguayan side to develop the system[62].

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60 Ultima Hora. Cónsul de EEUU monitorea puesto migratorio en Puente de la Amistad. ultimahora.com [Internet]. 2022 [cited 2022 Dec 9]; Available from: https://www.ultimahora.com/consul-eeuu-monitorea-puesto-de-migraciones-en-puente-la-amistad-n3022350.html.

61 Dirección General de Migraciones. Países de la Triple Frontera analizan normativas de intercambio y protección de datos para el control fronterizo [Internet]. 2022 [citado 12 de diciembre de 2022]. Disponible en: https://www.migraciones.gov.py/index.php/noticias/paises-de-la-triple-frontera-analizan-normativas-de-intercambio-y-proteccion-de-datos-para-el-control-fronterizo.

62 Dirección General de Migraciones. Migraciones presenta informe de gestión correspondiente al periodo 2021 [Internet]. 2022 [cited 2022 Dec 9]. Available from: https://www.migraciones.gov.py/index.php/noticias/migraciones-presenta-informe-de-gestion-correspondiente-al-periodo-2021.

# MAIN FINDINGS

This section will aim to describe in a succinct and effective way the current state of the art of both Muralha Inteligente and the SMARF systems. It will build both on the introduction and documentary review sections and connect them to the most up-to-date situations of such policies and its potential evolutions.

## FOIAS

### Muralha Inteligente

DPBR has sent four sets of FOIA[63] requests for the organs involved in the Muralha Inteligente project, namely (i) The Federal Revenue (RFB); (ii) The Ministry of Economy; (iii) Itaipu and (iv) Itaipu Technological Park. Although different, the questions aimed at discovering not only how the project works but, mainly, which technologies are used and their capacities (specially in terms of human rights violation risks), how data is collected, processed and stored, and which legal regime regulates it[64].

On the one hand, Itaipu did not provide any additional information nor answered all the fourteen questions. It redirected all questions to the Federal Revenue. The PTI stated that, because the projects have sensitive/delicate information and because they deal with national security issues, they must have their secrecy protected and not disclose any answers. It is important to point out that not even the questions that did not ask sensitive information were answered, such as the question of which Brazilian law regulates the use of drones or the request to access the document that celebrates the agreement from which Muralha Inteligente was born. The Federal Revenue and the Ministry of Economy FOIAs were very complete, answering all of the questions, one by one. Here are the main findings based on these two latter bodie's answers.

Brazil's Federal Revenue Service, the federal body responsible for customs inspection, has the competence for inspection and control of goods, vehicles and goods of travelers entering or leaving the country. The technological solutions created within the scope of the Muralha Inteligente project aim to make the Federal Revenue's exercise more efficient and effective[65]. RFB stated that the program was elaborated due to the large volume of irregularities and crimes historically committed in the border region, combined with the low number of public servers available in the custom area. The need for the program also coincides with the reasons that motivated Law nº 14.129/2021[66], which provides principles, rules and instruments for Digital Government and

63 The FOIA Requests sent by Data Privacy Brasil Research Association can be found in the following link: https://docs.google.com/spreadsheets/d/1HJusL4zfBhnJSn8djvaVRKYuOHMLgWPGGQt8WbY2TGk/edit?usp=sharing

64 Due to the difference in their legal nature, the questions aimed at Itaipu and PTI were not sent via FOIAs - such as the ones sent to the Ministry of Defense and the Federal Revenue -, but via an ombudsman indicated in both their official websites.

65 Associação Data Privacy Brasil de Pesquisa. Solicitação de acesso à informação pública à Receita Federal do Brasil sobre o projeto Muralha Inteligente [Internet]. 2022 [cited 2022 Dec 10].

66 Brasil. Lei nº 14.129/2021, de 29 de março de 2021. Dispõe sobre princípios, regras e instrumentos para o Governo Digital e para o aumento da eficiência pública e altera a Lei nº 7.116, de 29 de agosto de 1983, a Lei nº 12.527, de 18 de novembro de 2011 (Lei de Acesso à Informação), a Lei nº 12.682, de 9 de julho de 2012, e a Lei nº 13.460, de 26 de junho de 2017. [Internet]. 2021 [cited 2022 Dec 13]. Available from: https://www.planalto.gov.br/ccivil_03/_ato2019-2022/2021/lei/l14129.htm.

for increasing public efficiency.[67] The main innovative technologies used within the project are the ones that monitor areas of interest (including the use of drones) and the recognition of characters from license plates (OCR).

As mentioned above, Muralha Inteligente is part of the bigger project Fronteira Tech, which is a "fantasy name" used internally by the RFB to bring together the development of technological solutions that allow for the maintenance or improvement of the quality and effectiveness of customs control at the Border in the region of Foz do Iguaçu, due to cuts in the number of servers, with special focus on the International Friendship Bridge[68]. The Ministry of Economy curiously gave a very similar description to what Muralha Inteligente is:

> [...] a generic name or "fancy name" used internally at the RFB to bring together the development of technological solutions that allow for the maintenance or improvement of the quality and effectiveness of customs control at the Border in the region of Foz do Iguaçu in the face of a situation of acute restriction of servers, which evolve and complement those initiated within the scope of Fronteira Tech, extrapolating the initial focus of Ponte Internacional da Amizade.[69]

Muralha Inteligente collects data such as, but not exclusively, quantity of vehicles that circulates, time of circulation and identification plates. The Federal Revenue classified the data as "factual data that a public servant could collect in person in a public environment of cross-border vehicle traffic and that are merely tabulated in an automated way by a computerized system"[70]. (FOIA, RFB). The data is stored for an indefinite period on servers physically located on the premises of the Federal Revenue Service - it does not, however, constitute a public database: it is restricted for the supervisory body's use. (FOIA, RFB). The purpose of the data is to maintain or to improve the quality and efficiency of the custom's service in the Foz do Iguaçu region due to a scenario of very restricted servers working for the RFB. When asked if there were human based decisions based on the technologies used, RFB stated that all information collected and tabulated is used to support decisions taken by public servants who have the competence to inspect cross-border traffic of vehicles, goods and travelers' goods.

The developers of technological solutions (private parties) have access to some data in the development environment to carry out tests, without the possibility of exporting the data[71][72] It was not specified neither which data they have access to, nor the type of tests they are allowed to conduct. There is also no information regarding the purpose of those tests - not even if they are conducted to improve the Muralha Inteligente's project or for another end.

67 The same justifications were given by the Ministry of Economy when asked about Fronteira Tech.

68 Associação Data Privacy Brasil de Pesquisa. Solicitação de acesso à informação pública ao Ministério da Economia sobre o projeto Muralha Inteligente [Internet]. 2022 [cited 2022 Dec 10].

69 Ibidem.

70 Associação Data Privacy Brasil de Pesquisa. Solicitação de acesso à informação pública à Receita Federal do Brasil sobre o projeto Muralha Inteligente [Internet]. 2022 [cited 2022 Dec 10].

71 Ibidem.

72 When asked about Fronteira Tech, the Ministry of Economy answered that there is no access by private parties.

The data is only exchanged with public administration bodies and/or entities, and only in cases where there is a cooperation agreement. No other countries are involved in the implementation of Muralha Inteligente.

Importantly: there was no mapping of possible risks to human rights within the scope of the project and, to justify why there is no impact assessment for the use of the technologies employed, the organs claimed that the project is still under development, which should mean that an effective impact of the technological solutions cannot yet be measured[73]. This is a misconception of impact assessment – impact assessments are tools used to analyze the possible consequences of a given activity, which impacts one or several relevant social interests. These tools aim to help the decision-making process on whether this given activity should begin and under what conditions should it begin. The impact assessment, thus, serves the purpose of being a means to protect the social interests affected by a determined initiative[74].

Finally, the Federal Revenue explained that they used technologies that were already in use by them in other areas and that could be adapted for use in the project's objectives (as is the case of facial recognition and the license plate recognition system), which had already been duly justified previously, while presenting some international literature recommending the use of emerging technologies to improve the delivery of public services related to customs control[75].

It is worth dwelling briefly on this international literature presented to understand the theoretical premises adopted by the organs in question - all of which talks about digital transformation within government services and most focus on custom services - just to give some examples on what the chosen technologies are justified upon.

73 Associação Data Privacy Brasil de Pesquisa, Op. cit.

74 Kloza D, Van Dijk N. Gellert RM, Borocz IM, Tanas A, Mantovani E, et al. Avaliações de impacto sobre a proteção de dados na União Europeia: complementando o novo regime jurídico em direção a uma proteção mais robusta dos indivíduos. d.pia.lab Policy Brief, 1/2017, 1-8. [INTERNET]. 2020 [cited 2022 Dec 10]. Available from: https://cris.vub.be/ws/portalfiles/portal/49998404/dpialab_pb2017_1_final_PT.pdf

75 (i) https://international.vlex.com/vid/information-technology-customs-modernization-38363542
(ii) https://blogs.iadb.org/integration-trade/en/the-pandemic-an-opportunity-for-digital-transformation-in-customs/
(iii)https://e.huawei.com/se/publications/global/ict_insights/ict31-digital-government/features/digital-technologies-are-changing-the-way-customs-works
(iv)https://www.bomca-eu.org/en/news-archive/e-customs-and-its-advantages-are-in-thefocus-of-technical-assistance-mission-in-bishkek; (page not found)
(v) https://www.cepal.org/sites/default/files/publication/files/46817/S2000960_en.pdf;
(vi) https://www.imf.org/external/pubs/nft/2003/customs/ and
(vii) https://www.imf.org/en/News/Seminars/Conferences/2022/06/21/customs-matters
The exact same literature was presented by the Ministry of Economy when asked if there were studies that justified the use of the technologies employed in the Fronteira Tech program.

One of the materials presented[76] was an article published by the Inter-American Development Bank (IDB)[77] - an international financial institution that provides financing and technical support for Latin America and the Caribbean (LAC) in the areas of health, education and infrastructure. Named "The pandemic as an opportunity for digital transformation in custom", it is based on the premise that LAC's economic recovery after the pandemic depends mainly on how its foreign trade logistics perform which, in turn, depends on an appropriate physical and digital infrastructure and related transportation services.[78] In other words, it argues that authorities in Latin America and Caribbean can improve competitiveness and economic growth by leveraging new technologies and innovations to boost digital transformation and streamline foreign trade logistics, optimizing, automating and digitalizing customs and border processes:

> LAC countries should embrace the availability of new technologies, the fast-track innovation induced by the pandemic, and the support of international organizations, such as the IDB, to expedite the digital transformation of their customs administrations[79]

Most of the arguments are presented in a way that shows how new technologies can increase efficiency in terms of improving the custom's agility and security and creating robust and effective risk management systems. The article also gives special attention to the strategy of coordinating border management systems based on the use of new technologies[80] to reduce time and costs for operators and increasing control capacities, encouraging interoperability systems, use of blockchain technology and the application of technology in entry, inspection and monitoring systems for a functional infrastructure. The article gives examples of countries which are implementing projects to modernize customs and border management with IDB's support: Colombia[81], Peru[82], Nicaragua[83], Costa Rica[84] and Panamá[85].

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76 Corcuera-Santamaria S, Sanjinés, JMG. The pandemic as an opportunity for digital transformation in customs. Beyond Borders. [Internet]. 2021 [cited 2022 Dec 13]. Available from: https://blogs.iadb.org/integration-trade/en/the-pandemic-an-opportunity-for-digital-transformation-in-customs/

77 IDB. About us. [Internet]. n.d. [cited 2022 Dec. 13]. Available from: https://www.iadb.org/en/about-us/overview

78 This diagnosis is based on the study detailed in their report "Logistics in Latin America and the Caribbean: opportunities, challenges and courses of action" May, 2021. CALATAYUD, Agustina; MONTES, Laureen, editors. p. cm. — (IBD Monograph ; 92).

79 Corcuera-Santamaria S, Sanjinés, JMG. The pandemic as an opportunity for digital transformation in customs. Beyond Borders. [Internet]. 2021 [cited 2022 Dec 13]. Available from: https://blogs.iadb.org/integration-trade/en/the-pandemic-an-opportunity-for-digital-transformation-in-customs/

80 IDB. Guía Dinámica Cómo Gestionar un Proyecto de Puesto de Frontera: de la teoría a la práctica. [Internet]. 2019 [cited 2022 Dec 13]. Available from: https://publications.iadb.org/publications/spanish/document/Gu%C3%ADa_din%C3%A1mica_C%C3%B3mo_gestionar_un_proyecto_de_puesto_de_frontera_es.pdf.

81 IDB. CO-L1245 : Program to Support the Modernization of the National Tax and Customs Directorate. [Internet]. n.d. [cited 2022 Dec 13]. Available from: https://www.iadb.org/en/project/CO-L1245.

82 IDB. PE-L1239 : Improving Tax and Customs Revenue Collection Services Through Digital Transformation. [Internet]. n.d. [cited 2022 Dec 13]. Available from: https://www.iadb.org/en/project/PE-L1239.

83 Sandino N. Puesto de Control Fronterizo de Peñas Blancas una moderna infraestructura en Nicaragua. El 19 Digital. [Internet]. 2019 [cited 2022 Dec 13]. Available from: https://www.el19digital.com/articulos/ver/titulo:91983-puesto-de-control-fronterizo-de-penas-blancas-una-moderna-infraestructura-en-nicaragua.

84 IDB. IDB approves financing for modernizing Costa Rica's border crossings. [Internet]. 2015 [cited Dec 13]. Available from: https://www.iadb.org/en/news/idb-approves-financing-modernizing-costa-ricas-border-crossings.

85 IDB. PN-L1107 : Customs Logistics Integration Program. [Internet]. n.d. [cited 2022 Dec 13]. Available from: https://www.iadb.org/en/project/PN-L1107.

The Huawei article, "Digital Technologies Are Changing Customs"[86], follows the same efficiency logic: if adopted correctly, an increase in the use of digital technologies and thus the creation of a greater automation in customs could make it more efficient and effective. It then proceeds to comment on why and how some technologies might be useful, like Cloud Computing (a platform for custom applications), Robotic Process Automation (increases efficiency), X-Ray Image Analytics (enhances inspection efficiency) and Internet of Things (improves security). In relation to the latter, it presents an important statement:

> There are, however, several challenges to the widespread use of IoT technology. One of these challenges is concerns about privacy, as IoT information could be considered private data, with it including individuals' habits, preferences, and locations. IoT also presents issues around digital evidence, data provenance, and traceability. Meanwhile, exchanges of IoT data among customs administrations could be tricky in terms of ownership of data, intellectual property rights, and data usage. Because of these issues, it's necessary to have appropriate policies and legislation in place to address data privacy and IoT data exchanges between customs administration.[87]

Nonetheless, based on the FOIA's answers, Muralha Inteligente does not have its own policy document. DPBR requested the agreement through which the project was celebrated to PTI, but as already mentioned, they did not answer any of the requested information because the "[...] projects have sensitive/delicate information and because they deal with national security issues, their secrecy must be protected.". (FOIA, PTI). The Federal Revenue and the Ministry of the Defense stated that Brazil's General Data Protection Law (LGPD) is the administrative act that regulates the collection and processing of this data. However, when asked which was the legal basis on which this collection and processing is based, the answer was mainly to point out another law (Law nº 13.019/2014[88]) instead of specifying one of the ten options available in article 7 of LGPD[89].

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86 Koh J. Digital Technologies Are Changing Customs. Huawei. [Internet]. n.d. [cited 2022 Dec 13]. Available from: https://e.huawei.com/se/publications/global/ict_insights/ict31-digital-government/features/digital-technologies-are-changing-the-way-customs-works.

87 The report "Digital Technologies for a New Future", also presented by the RFB as an example, seeks to contribute to the debate and to the deployment and use of digital technologies at national and regional level in support of development, including human rights concerns within its approach. Economic Commission for Latin America and the Caribbean. Digital Technologies for a New Future. [Internet]. 2022 [cited 2022 Dec 13]. Available from: https://www.cepal.org/sites/default/files/publication/files/46817/S2000960_en.pdf.

88 Which "establishes the legal regime for partnerships between the public administration and civil society organizations, in a mutual cooperation regime, to achieve purposes of public and reciprocal interest, through the execution of activities or projects previously established in work plans inserted in terms of collaboration, in terms of promotion or in cooperation agreements; defines guidelines for the promotion, collaboration and cooperation policy with civil society organizations; and amends Laws No. 8,429, of June 2, 1992, and 9,790, of March 23, 1999."

89 Art. 7 The processing of personal data can only be carried out in the following cases: I - upon the provision of consent by the holder; II - for compliance with a legal or regulatory obligation by the controlling shareholder; III - by the public administration, for the treatment and shared use of data necessary for the execution of public policies provided for in laws and regulations or supported by contracts, agreements or similar instruments, subject to the provisions of Chapter IV of this Law; IV - for carrying out studies by research body, ensuring, whenever possible, the anonymization of personal data; V - when necessary for the execution of a contract or preliminary procedures related to a contract to which the data subject is a party, at the request of the data subject; VI - for the regular exercise of rights in judicial, administrative or arbitration proceedings, the latter pursuant to Law No. 9,307, of September 23, 1996 (Arbitration Law); VII - for the protection of the life or physical safety of the holder or a third party; VIII - for the protection of health, in a procedure carried out by health professionals or by health entities; VIII - for the protection of health, exclusively, in a procedure carried out by health professionals, health services or health authorities; IX - when necessary to meet the legitimate interests of the controller or a third party, except in the case of prevailing fundamental rights and freedoms of the holder that require the protection of personal data; or X - for credit protection, including the provisions of the relevant legislation. (free translation)

Moreover, and adopting a bird- eye view, it is important to point that while documents from international organisations are used to legitimise data sharing and efficiency gains, the projects promoted at Itaipu follow, in a way, a traditional developmental logic promoted by the military since the 1960s[90]. This characteristic is related to a Brazilian socio-economic element, which is the permanence of an industrial policy logic and use of the state apparatus (in this case, a public company built by the military during the dictatorship) to promote entrepreneurship and market solutions for smart cities.

## SMARF AND IN- HOUSE BIOMETRIC SYSTEM

The FOIA requests on the Paraguayan side were designed to separately understand how both the Smarf and in-house biometric system function. Aside from the answers provided by both the General Directorate of Migration and the Technological Park of Itaipú- Paraguayan side, the DGM also provided useful links from the National Directorate of Public Procurement, which are included in this section.

The questions sent to the DGM were organized under three thematic axes:

- Program Implementation
- Technology and data
- Evaluation and impact

The first axe sought to understand the purpose and implementation status of these systems, their scale and projection plans. For the in-house biometric system, it also sought to understand the nature of the relationship between the Paraguayan and Peruvian governments to develop it. In the case of the SMARF system it also sought to understand the reason and rationale of why it was moved to the Silvio Pettirossi airport.

The second axe sought to understand the type of technology used in both systems and the processing practices of the data collected, how many people have used the systems to date, as well as potential access to the data collected by the data holders themselves and by public, private and/or international cooperation actors.

The last axe sought to understand the pre-assessment tools or processes used by the DGM when implementing these types of policies.

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90 Evans P. O Estado como problema e solução. Lua Nova: revista de cultura e política, 107-157. [Internet]. 1993 [cited 2022 Dec 16]. Available from: https://www.scielo.br/j/ln/a/kyMbGKjkLCTpzmMjCpL8Vmv/?lang=pt; Schneider B R. The developmental state in Brazil: comparative and historical perspectives. Brazilian Journal of Political Economy, 35, 114-132. [Internet]. 2015 [cited Dec 16]. Available from: https://www.scielo.br/j/rep/a/JHVdt63NTjQ3pKSJFpxpntb/?lang=en; Burrier G. The developmental state, civil society, and hydroelectric politics in Brazil. The Journal of Environment & Development, 25(3), 332-358. [Internet]. 2016 [cited 2022 Dec 16]. Available from: https://www.jstor.org/stable/26197978.

An additional FOIA request was sent to the Technological Park of Itaipu- Paraguayan side, with the main purpose of understanding its involvement in the development of the in-house biometric system, and to access details of the cooperation agreements signed by the DGM and the PTI. However, the request was denied based on the grounds that the PTI is constituted as a non-profit civil association, with the status of a Foundation, and as such, is not subject to the FOIA request act. However, the details of the cooperation agreement were provided by the DGM.

### SMARF system main findings

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| **Program implementation** | The main purpose to acquire the SMARF system was the COVID-19 pandemic. It appears the DGM was in need of a technological solution to minimise the physical interaction between migration officials and people entering and leaving the country through the use of biometric identification terminals and automated access controls for migration self-registration. The argument was that this would allow for greater accuracy, agility and migratory health security for the entry and exit of people into the country in the health and regional context of the 2020 period due to the Covid-19 pandemic[91].<br><br>This goes in line with the tone in the DTIC memorandum N° 221/2020, which states that the objective of the project is to safeguard the health of migration officials, travellers and visitors through the use of biometric identification terminals and automated access controls[92].<br><br>Moreover, the system operated at the International Friendship Bridge from the 20/11/2020 to 23/12/2021. It was then transferred to the Silvio Petirossi airport in June 2022[93]. This means that there was almost half a year that all four terminals were inactive. The DGM argues that after internal analysis of the use of the system at the border crossing point, they decided to remove the biometric identification terminals to make better use of the technology[94]. |

91 TEDIC. Solicitud de acceso a la información pública sobre el sistema SMARF [Internet]. 2022 [cited 2022 Dec 10]. Available from: https://informacionpublica.paraguay.gov.py/portal/#!/ciudadano/solicitud/60836

92 Dirección Nacional de Contrataciones Públicas. Documentos anexos Licitación 385838 [Internet]. 2020 [cited 2022 Dec 10]. Available from: https://www.contrataciones.gov.py/licitaciones/adjudicacion/contrato/385838-grupo-empresarial-preven-tec-s-a-2.html#documentos

93 TEDIC. Solicitud de acceso a la información pública sobre el sistema SMARF [Internet]. 2022 [cited 2022 Dec 10]. Available from: https://informacionpublica.paraguay.gov.py/portal/#!/ciudadano/solicitud/60836

94 Ibídem.

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| **Technology and data** | The FOIA requests points to different processes within the biometric terminals to allow for effective identification. It consists in the software and hardware for authentication by facial recognition, authentication by reading and scanning documents and passports, authentication by reading and scanning QR codes and the registration of corresponding migratory movement[95]. When thinking in the different databases interacting for the system to work the FOIA points to the integration of the migration databases, National Police Identification Department and the 911 system[96].<br><br>This goes in line with procurement documents. Particularly, the UOC N° 634/2020 notes that since part of the objective of the system is the verification of the identity of the person and if the person has any type of restriction or arrest warrant, it is necessary to integrate them into the 911 Wanted database[97].<br><br>In relation to the type of data registered by the system, it records the following data: full name, identity document number, origin of travel, flight identification, date and time of entry or exit, photograph at the time of entry. Such is the data determined by the migration institution for the registration of entry and/or exit of nationals. More importantly, the FOIA highlights that such data collection is similar to the one used by the current biometric migration system PIRS- MIDAS, developed and provided by the International Organisation for Migration, which is being used in the main migration control posts of the national territory since 2016[98]. More importantly, the DGM notes that data collected in this system is stored without time limitation.<br><br>Lastly, the UOC N° 634/2020 notes that in the design of the procurement process, all potential bidders were required to be licensed as an electronic security company[99]. It is worth noting that such a licence is provided by the Economic and Financial Crimes Department of the National Police. According to the general regulations governing the matter, private security companies providing services through electronic systems are engaged in the following activities: Providing security through electronic alarms and remote surveillance with support service; Installation of general electronic systems and installation of mechanical and electronic security systems[100]. There is no reference to security or data protections requirements to issue the licence.<br><br>Lastly, it is important to point that the FOIA highlights that the migration data recorded in the SMARF and all the systems used by the DGM are housed in the institution's servers and managed according to criteria of confidentiality and under the framework of national security[101]. |

95 Ibidem.

96 Ibidem.

97 Dirección Nacional de Contrataciones Públicas. Documentos anexos Licitación 385838 [Internet]. 2020 [cited 2022 Dec 10]. Available from: https://www.contrataciones.gov.py/licitaciones/adjudicacion/contrato/385838-grupo-empresarial-preven-tec-s-a-2.html#documentos

98 TEDIC. Solicitud de acceso a la información pública sobre el sistema SMARF [Internet]. 2022 [cited 2022 Dec 10]. Available from: https://informacionpublica.paraguay.gov.py/portal/#!/ciudadano/solicitud/60836

99 Dirección Nacional de Contrataciones Públicas. Documentos anexos Licitación 385838 [Internet]. 2020 [cited 2022 Dec 10]. Available from: https://www.contrataciones.gov.py/licitaciones/adjudicacion/contrato/385838-grupo-empresarial-preven-tec-s-a-2.html#documentos

100 Policia Nacional. Reglamento orgánico funcional de la División Fiscalización de Empresas de Seguridad Privada y Afines dependiente del Departamento de Delitos Económicos y Financieros de la Policía Nacional [Internet]. Available from: http://www.delitoseconomicos.gov.py/application/files/1314/2965/1141/REGLAMENTO_319__para_empresarios.....pdf

101 TEDIC. Solicitud de acceso a la información pública sobre el sistema SMARF [Internet]. 2022 [cited 2022 Dec 10]. Available from: https://informacionpublica.paraguay.gov.py/portal/#!/ciudadano/solicitud/60836

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| **Evaluation and impact** | The FOIA does not explicitly states the existence or not of human rights impact assessments of any sort, but rather focus in stating that the implementation of biometric systems for the registration and control of persons entering and leaving the national territory does not contravene the provisions of the National Constitution, the Migration Law in force, the National Migration Police or the international treaties and conventions signed and ratified by the Republic of Paraguay, since it complies with the standards of computer security and data protection required for the use of this type of technology by State bodies[102]. |

### In- house biometric system main findings

The FOIA answers refers to an institutional need for an in-house biometric system, for more autonomy of the DGM when customising the system. Concretely, the FOIA answer mentions that since 2016, the DGM has made an effort to keep up with modern technological challenges and has implemented the PIRS- MIDAS system, with the help of the IOM[103]. The PIRS- MIDAS is indeed a tool that allows for the use of biometric technology for border management. However, the disadvantage is the dependence on third parties (IOM) for technical support.

It can be inferred that the implementation of the PIRS- MIDAS system has not been exempt from challenges. Issues such as dependence on staff from outside the institution for technical support, lack of updating of the system to meet required needs, high response times for support and synchronisation problems at the checkpoints are some of the problems mentioned in the FOIA[104].

The above can constitute some of the main arguments to justify the development of such a policy. However, it would seem that since the initial conversations with the Peruvian government started to develop such a system, not much has been done. Namely, there is no document establishing responsibilities for either state. The DGM mentions in the FOIA that work was being done on the draft "Cooperation Agreement between the General Directorate of Migration of the Republic of Paraguay and the National Superintendence of Migration of the Republic of Peru", but it was not possible to sign it[105].

Moreover, there is no evidence of the existence of a human rights impact study to further evaluate the need of this system, and under the argument that the DGM already implements a biometric system at the country's busiest migration posts[106].

102 TEDIC. Solicitud de acceso a la información pública sobre el sistema SMARF [Internet]. 2022 [cited 2022 Dec 10]. Available from: https://informacionpublica.paraguay.gov.py/portal/#!/ciudadano/solicitud/60836

103 TEDIC. Solicitud de acceso a la información sobre sistema biométrico propio [Internet]. 2022 [cited 2022 Dec 10]. Available from: https://informacionpublica.paraguay.gov.py/portal/#!/ciudadano/solicitud/61603

104 Ibidem

105 Ibidem

106 Ibidem

Lastly, and although it would seem that to date there is no in-house biometric system, the DGM has provided information as to what institutions access information collected by the existing biometric system[107]. Concretely, the data collected is shared through the Ministry of Information and Communication Technologies (MITIC), under the Information Exchange System service, which is an interoperability platform, acting as a channel between state institutions and organisations to share information. This information sharing is achieved through standards-based interconnections of systems and databases within the public sector that are physically separated and distributed in different government buildings. It is a service oriented to public institutions, which allows public servants in charge of managing civil affairs to check online the information they need from other institutions' systems, as well as to integrate such information to their existing systems through integration and consultation mechanisms. In the particular case of the DGM, information is shared with other public entities through the signing of agreements and/or through arrangements made with MITIC, where access to the information is authorised by means of consultations, through the duly accredited channel and user[108]. The entities with whom information is shared through this system are the:

- Ministry of Public Health and Social Welfare.
- SEPRELAD (Anti-money laundering agency)
- National Customs Authority
- SENAD (Anti-drug agency)
- SEDERREC (Development Secretariat for Repatriated and Refugee Nationals)

107 Although there is no clarity in the FOIA answer as to what biometric system the DGM refers to, it is reasonable to say that it refers to the PIRS- MIDAS system

108 TEDIC. Solicitud de acceso a la información sobre sistema biométrico propio [Internet]. 2022 [cited 2022 Dec 10]. Available from: https://informacionpublica.paraguay.gov.py/portal/#!/ciudadano/solicitud/61603

## INTERVIEWS

### Muralha Inteligente

- *PTI's modernization strategic planning*

One representative from the Parque Tecnológico de Itaipú (PTI), who works in the general administration of the Park, was interviewed for this project. This person is in a position of leadership in relation to most of the current projects that aim to increase the employment of technology - as mentioned above. In this sense, this interview's main finding revolves around understanding the projects - namely, Living Lab for Smart Cities, (ABDI and PTI), Fronteira Tech, Vila A Sandbox Project and Muralha Inteligente -, how they relate to one another and, mainly, have a grasp on the narrative that supports the increase in the use of technological gadgets.

While explaining the difference between Itaipu (a binational company, 50% Brazilian and 50% Paraguayan) and the PTI (one of the three foundations of Itaipu, designed in 2003, a great research center for Itaipu focused on meeting its technical demands), the interviewer stated that PTI focuses on four main areas: (i) agrobusiness; (ii) energy; (iii) security (which includes from the safety of critical infrastructures to cybersecurity) and (iv) tourism. In 2019, the last year before the COVID-19 pandemic, there was a reformulation of the strategic planning, unifying the strategies of managing its budget and adopting an austerity policy (for instance, ending some contracts and agreements that were not aligned with PTI's mission, investing the remaining budget in major structuring works, which "return the value to society"[109] and diversifying the Park's revenue resources in order to reduce the dependence on Itaipu's subsidies). This means that, since 2019, PTI's financial focus shifted from Itaipu's agreements and turned to the market in a movement that prioritizes investments in entrepreneurship and innovation, seeking to find partners interested in solutions that were once only for Itaipu. This was achieved with the creation of the Business and Innovation Department.

This mentality of revenue diversification and focus on the market begins at the start of each new project: there is an awareness not only of what can be bought from the market but also which technological solutions could be sold, in the future. The interviewee stated that this is a shift of mindset required from employees.

109 An example of this are the expansion of the runway at Foz do Iguaçu airport, which can now receive international flights and the construction of bridges between Brazil and Paraguay (one of them is in the final stages of being completed, a Perimeter bridge that will make sure that the entire flow of trucks coming from the trade that exists here in the border region between Brazil, Paraguay and Argentina, which circulate through this bridge, they come today inside the city, it starts to leave the city and goes straight to BR 277).

- *The investment mindset: Muralha Inteligente in the context of other PTI's modernization projects (Living Lab, Vila A and Fronteira Tech)*

Muralha Inteligente is part of a bigger security program: Fronteira Tech. The interviewee also gave some context regarding not only these two projects, but also other ones that fit in the same boat of PTI's modernization goal: Living Lab and Vila A's Sandbox. In the literature review, a hint of the connection between them was already laid out as a "living organism": one paved the way for the other.[110]

As the interviewee stated, everything began with the Living Lab project (2019), which integrated all the technologies existent in PTI (such as electric vehicles, smart shared bikes and smart street lighting with WiFi, cameras and drone payment sensors) and created an operational command and control center", in the interviewee's words. Living Lab was defined as "[...] a large controlled space for testing solutions that we could be seeing in our cities in the future." (Interviewee - Minute 20:25).

In October 2019, in a conversation with the president of ABDI, the idea for the Vila A Inteligente came up from the perception that, in a public space, there are a series of interactions that one has no control over, that you have not thought about, etc. Vila A would be the first Brazilian public neighbourhood to be conceived in a sandbox structure in Brazil.[111] The city hall of Foz do Iguaçu, a fundamental partner in this type of initiative, created this space where technologies could be tested, tried and validated. The interviewee affirmed that in order for this kind of initiative to work, sometimes legislation has to be flexibilized in the area - for instance, there was a need to install a technology in a certain place, but it could not be done due to legislation restrictions. The city hall's support and the sandbox decree gave them the mobility needed.

Vila A's project was built from a contribution of resources from Itaipu Binacional and a contribution of resources from ABDI for the installation, the purchase of cameras, and sensors, and so on. The idea was to always work "[...] towards urban mobility, public safety, energy efficiency." (Interviewee 1- Minute 20:25). The logic of the project corroborates with the overall PTI's efficiency and saving mindset: attracting private companies instead of paying for the technology.

> We create notices, which we call Smart Display. What happens in this announcement? If before we bought the technology to install here in the neighbourhood, now companies have started to offer placing their technology here. [...] So they come and install their technologies, which are tested, validated and we give them feedback. (Interviewee - Minute 20:25).

110 PTI. Lançamento oficial do Guia Sandbox para Cidades Inteligentes [cited 12 December 2022]. Available at: https://www.pti.org.br/lancamento-oficial-do-guia-sandbox-para-cidades-inteligentes/

111 Vila A was chosen because it was a region that Itaipu was historically present in and had an "intermediary population": a mix from "engineers"(Vila B) and "humble people" (Vila C).

This feedback is formulated based on the residents of the neighbourhood perception of the technologies. In a nutshell, Vila A is a neighbourhood in which real people live and where technologies offered by private companies are tested, tried, validated and certified with the endorsement and incentive of the government and PTI, and improved based on resident's perception and organised feedback (such as the ones from a quality infrastructure lab created within an university for this purpose). There is a two-way benefit in this dynamic:

> This ends up being positive for the company, because it can carry a seal like 'look, my technology has already been tested, it has already been validated, signed by a certifier and validated by these institutions.' And it's also good for the public manager who is going to buy a technology that has already gone through this whole process. He is not going to use a technology that was produced in a backyard, which in three and four months will already be causing problems. (Interviewee - Minute 20:25).

The interviewee mentioned as examples tests in regards to smart traffic lights, but also of facial recognition systems, which ruled out, for instance, technologies that did not properly recognize people with beards or glasses.

When asked if the residents had a voice in the matter of living in an area subject to technological tests, the interviewee did not properly address the issue of a prior assessment and consent of the residents. It explained that there were efforts to talk to representatives from the City Hall and residents association to "show them what was being done" and the creation of ombudsman channels were created to listen to complaints after it was in progress. Most of the answers focused on the intention of the project: giving a better quality of life for the citizens.

> We are using these technologies, but with the aim of improving the citizen's quality of life and, at the end of the process, he will have more time for himself and his family to be able to make better use of the technology (Interviewee - Minute 20:25).

Nonetheless, since it is a technological testing program and, therefore, there is a risk of the technology to be contested, the interviewee highlighted what he understood as the importance of dialogue,

> In fact, the resident ends up being, let's put it like this, in quotes, a kind of guinea pig, because, just as you are bringing things that will help, some may end up having the opposite effect for us over there. So, the conversation with the resident is important for him to understand and see how it will be helping him and, at the same time, for us to have feedback. Thank God, until this moment we didn't have any technology that was contested because it wasn't bringing benefits, etc. But it could have happened. (Interviewee - Minute 37:55).

This dynamic of knowing the technologies capabilities (and, therefore, understanding what you need and what you don't) and having the expertise on making a sandbox decree paved the way for Fronteira Tech, a project that, although benefited from PTI's help, was implemented by INDT. And Muralha Inteligente, as already mentioned, an agreement which is part of Fronteira Tech and a partnership between RFB, Itaipu and PT, aimed at developing these technologies based on the demands of the Federal Revenue, to combat illicit activity in the border region.

This shift of mindset and policies revolving around technology escalated Foz do Iguaçu to the thirty-fifth position in the ranking of smart cities in Brazil (in comparison to seventy-ninth in 2021). The interview made it clear that PTI is working within an investment mentality:

> you have to change the mentality of the public manager himself. He identifies that investing in making his city smart is good not only for him as a public manager, it is good not only for the citizens, who will have more technology at his disposal, but it is good because it attracts business. So, Foz do Iguaçu, despite the pandemic, continues to grow. It is increasingly bringing new investments to the city, because you create a virtuous circle in this process (Interviewee - Minute 59:52).

- *Institutional Dialogue and Drone Technology*

The RFB did not explicitly reach out to PTI, nor did PTI solely reach out to RFB to help; it was a midway agreement. RFB already knew that PTI employed drones to monitor the border and PTI already had another project ongoing with RFB, so, according to the interviewee, "the Revenue already knew our potential as a technology park." (Interviewee - Minute 37:55).

Flying helicopters is expensive, so drones are an interesting solution to monitoring the area. While RBF envisioned the project they wanted (use of drones and high definition cameras to monitor the border), they did not have the resources to implement such a project. There was a match in terms of offer and demand between institutions: RFB had the demand and PTI, the offer (technology and experience - including in training the personnel to use the drones). Based on this complementarity, the project was built.

The interviewee confirmed that the main acquisition of the project were the drones: there are large and small drones, which can be controlled from inside the police car and help in cases where the suspect's vehicle did not stop at the border and found a way to hide in places hard to find (the example given was one of a plantation). The drone helps because:

> The entire movement of the car will be followed and when the car stops or people leave the police will come. The Revenue, together with the Federal Highway Police or the Federal Police, as the case may be, will act and will thus be able to apprehend the material and arrest people who are committing crimes. (Interviewee - Minute 40:08).

The drones are not PTI's property. The Park is responsible for acquiring it from a company that supplies equipment to the RFB (the name of the company was not mentioned), and for the technical part - testing it and passing on to RFB which drones will operate. In other words, PTI is the tool that helps RFB implement the drones. PTI also has courses available to teach how to operate a drone (which are not exclusive to the Revenue). The resources for this purchase comes from Itaipu.

- *National Security Concerns and Private Parties*

Since the gadgets are bought from a private company, they theoretically know how the equipment works. When asked about concerns in regards to what private companies will know in terms of public safety, the interviewee acknowledged that this may be an issue, but that "we have to live with", since public security ends up using equipment that was produced by the private sector in any area. Nonetheless, although the producers know how technology works, they do not know how it will be used by public security officers and policies - and this creates a gap of knowledge that reduces this risk. Specifically, the example given in regards to Muralha Inteligente. The private parties are able to know the class of the drone used in Muralha Inteligente and some of its operational characteristics, but they cannot know when the drone will be used:

> Muralha Inteligente cannot prevent all smuggling, but it generates, for those who are committing the wrongdoing, the insecurity of not knowing at what moment it will be being monitored (Interviewee - Minute 40:08).

The interview also confirmed that there is no exclusivity clause in these purchase contracts, prevailing the market logic. Concretely, this means that the same technological equipment purchased by public security organs can be purchased and used by anyone (public or private parties). Nonetheless, the interviewee stated that there is some kind of protection within the contracts that assures some confidentiality. The example given was technological equipment purchased for police vehicles cannot be used in conventional cars, due to traffic laws.

- *International Cooperation*

Considering that Muralha Inteligente is a border control initiative, which involves the Brazilian frontier with Paraguay and Argentina, the theme of international cooperation between these countries was brought up. In this sense it was said that one of the advantages of this project is its location in the trinational region.

> Argentina, Paraguay and here and we have gradually delivered these solutions to the Federal Revenue Service, they have already been working a lot with these drones. Gradually we will be completing the entire project, which would be, as the name implies, a great wall. I would say that we are still in the phase of having some, some walls not yet fully connected. (Interviewee - Minute 20:25).

The interviewee stated a lack of knowledge of any international cooperation agreements, but did not rule out the possibility of its existence. From previous experiences in national security and the army, the interviewee stated that there are regular meetings between the Armed Forces of the countries, which also involves the Federal Policies where they make their agreements on how to work together. As an example, the interviewee mentioned CIOF, in which different public security bodies monitor the border and exchange information that comes, for instance, from facial recognition.

- *Technology and its risks*

Although the interviewee acknowledged technology's limitations, the overall narrative is that - specially since the COVID-19 pandemic - technology is not only inevitable, but a way of facilitating life because technology's assistance is time saving. Concerns were laid out in regards to the need for cybersecurity and caution with cyber attacks: PTI has an agreement in partnership with the Brazilian Army, which is responsible within the National Defense Strategy for the cybernetic area. Nothing was mentioned in regards to caution in regards to human rights violations.

There is a perception that the legal framework is sometimes an obstacle for this innovation sprint:

> Although you can contract a technological order, everyone is very afraid of what the Federal Court of Accounts or the State Court of Accounts will say, will do, whether it will accept it, if it will not accept it. (Interviewee - Minute 59:52).

**SMARF**

Two interviews were conducted in the Paraguayan side. Namely, one representative from the project management and one from the IT departments of the DGM. Such interviews were instrumental in better understanding both the current state of art the regarding the SMARF and the in-house migration system. Interviews were organised under the same thematic axes followed in the FOIAs. Findings in the Paraguayan section will be presented in a similar manner.

The interview was particularly useful to understand the technology and data particularities regarding the SMARF system. This section will then predominantly focus on such information.

- *Program implementation*

It would seem that the main value of implementing the SMARF is agility at border entry points. As pointed out by one of the interviewees, the reason the system did not work in the Ciudad del Este border is that the infrastructure and type of migration flow is not suitable for the SMARF systems.

> So, this is designed for the entrance, at one point, the enrollment that was done in Ciudad del Este would have worked if we had another type of infrastructure. This was intended for the airport, but at the time, because of the distance... well, it was not placed, it is not going to work there because the location does not help. So [...] it has to be a place where it really speeds up the entry, especially for Paraguayans and foreign residents, who are the ones who have the national identity card (Interviewee 1- Minute 10:16).

- *Technology and data*

There are numerous findings regarding how the system works and the rationale behind the implementation of the policy.

The SMARF terminals are only usable for Paraguayan and foreign residents. This is because the system only accepts national identity cards to start the self-registration process. The database that is consulted to validate and match the identity of the person with the picture that is taken when arriving at the airport is the national police identification database.

> This device, this equipment, what it does is, when you, Paraguayan or foreign resident, introduce your identity card, and put your face, it says that you are the person on the card, and it makes its query to the police computer database, which is the same one we use in all the checkpoints (Interviewee 1- Minute 01:54).

Algorithms are used in the process of matching the picture taken in the airport with the picture in the national police database. However, it would appear that the only thing saved in the system is the recognition made by the algorithm[112]. The surrounding metadata is not saved.

> They are algorithms that compare the photograph that is in the police database with the photograph that you are taking at the moment and do the verification. The algorithms generate the comparison, but the result of the algorithm is not saved, only the recognition, the metadata is not saved (Interviewee 2- Minute 06:38).

> The metadata, that information is not saved, what is saved is the raw photo that was taken of that person. It is recorded in the migration database (Interviewee 2- Minute 07:25).

> What we do is consult the police and make comparisons. And that is stored on our own server that we have at the airport and then the information is uploaded to the head office (Interviewee 2- Minute 07:44).

It would appear that the above process is the same as the one currently used in the PIRS- MIDAS migration system provided by the IOM and already mentioned above in the FOIA request section.

> Because the system itself is not, it is not that you use a sensitive database. Its the same database that we use for the "Midas", for the "PIRS MIDAS", for our system that we have in all border posts. What we did with this is to facilitate and speed up the process, so that Paraguayans and foreign residents in our country can do their migratory self-registration (Interviewee 1- Minute 01:54).

112 Further clarifications were asked by the research team in regards to this topic and the DGM has provided with the following answer: "We do not store anything concerning the result of the biometric comparison between the photo in the police database and the photo taken by the SMARF: We do not store the reference points of the facial features, nor the biometric patterns, we only compare the stored and captured photo and then the system assumes or not that it is the person and stores the movement and the taken picture in the moment". There is no reference made to the metadata.

More importantly, it appears that there is a tight control from the DGM and of the data generated both in the PIRS- MIDAS systems and now also SMARF systems. In the case of the latter, and although there is some dependency of third parties to maintain the system, all the database and application servers are under the control of the DGM. With this, the institution rejects any unsolicited or unlawful access by private sector third parties. Very importantly, the institution is involved in the maintenance process in order for its technical staff to learn about the process and later on have the institutional capacity to maintain the system in its own.

> The databases and all application servers of this system is under the domain of migrations (DGM). Now, to do the corresponding support and maintenance, a staff of the company that won the tender always does it in the company of local technicians. Yes, because of the fact that this equipment comes with a guarantee and the corresponding maintenance. It is precisely with these points in mind that the call itself talks about technology transfer so that we can carry out the maintenance and provide sufficient support so that this technology can continue (Interviewee 2- Minute 12:34).

On the other hand, and thinking in the issue of not erasing any migration data located in its servers, it would seem that the current law in force requires to keep migration data stored.

> Many times they ask for historical data of certain relatives, grandparents, uncles and aunts, or also of some document that we as an institution can give them. So, first part of that and then part of the registration of migratory movement, which in the previous law and in the current law states that this must be kept and registered (Interviewee 2- Minute 17:27).

> The law states that it must remain in the migratory database. That's why we need to expand our servers because the load is going to grow and having just one datacenter is not enough for us (Interviewee 1- Minute 19:10).

Lastly, and going again to the issue of algorithms, it would appear that there isn't much regard when thinking in how these automated systems can impact vulnerable communities, such as racial and ethnic minorities, LGTBQI+ groups and others.

> We have the database of the police information technology. In other words, they are all those who are in the police computer system: We Paraguayans and foreign residents in our country. If a black person or a Chinese or an Indian is there, it will be in the police database, that is, its photo will appear there because it had to have its photo taken, its fingerprint and everything in identifications [...] In the event that they don't recognise you, it's not that they don't recognise you because you look like Carmen Villalba, it's because your photo doesn't match the data (Interviewee 1- Minute 21:48).

For any process that may entail a mismatch of the person's identity, a secondary control process is activated. Such protocol entails a human verification in one of the traditional entry boots in the airport.

> In these cases, when you talk about these situations, there is always an intervention by an official who is in charge of this, the verification is made between that person and the observation of why the system did not recognise him or her or did not enable him or her to make the movement, and the movement is verified and carried out (Interviewee 2- Minute 23:02).

Lastly, and in relation to potential privacy notices in the SMARF boots, to showcase details regarding the data that is collected by the system, there is no provision in implementing such warnings in the near future

> Nor is it going to be planned, I reiterate, it is to speed up the entry, it is up to you to go there or go to the box. The same procedure can be done here or here, except that here you will have an immigration inspector intervening and here you will be checked by a machine. Here we are not only providing machines, we are providing two options. Do you want to speed up? You go here, you want to go...? You don't want the machine because you are afraid of it? and you go here (Interviewee 1- Minute 26:28).

**In-house biometric system**

The interviews come to confirm that the in-house biometric system was never developed. Interviews also evidence the necessity of a system of this sort not only due to implementation problems with the PIRS- MIDAS, but also because at present there are different IT programmes operating in different borders.

> First of all, we don't have our own system. It was an idea we had at the beginning [...] The benefit of having our own system means that you as an institution can adapt to the times and needs of your technicians, on issues, later he will talk to you about the technological part, but I am talking about the ease of what we think [...] Today, migration has several systems developed by the same officials here, the PIRS-MIDAS and others that the officials themselves developed and that are not unified. They all work in isolation from each other (Interviewee 1-Minute 0:20).

> Let's remember that there are posts that we don't have connectivity. MIDAS cannot be implemented without connectivity. So we do use the system developed by migration staff, which is "in house", it's called e-Frontera, which has the same, the same as MIDAS, only it's not a biometric system (Interviewee 1-Minute 1:50).

It would also appear that since the possibility of developing an in-house system never went further than initial planning, issues such as developing this system with the most up to date privacy friendly standards (I.e. privacy by design) were never really though. However, at least from an institutional standpoint, keeping data safe does seem like a priority

> We also have a policy of keeping our data private, well protected [...] as an institution we do not divulge this type of information. (Interviewee 2- Minute 06:22).

Lastly, unlike other state modernisation programmes with a digital component, it does not seem that there is a support or particular international cooperation programme to develop the system in the country. However, there is an institutional will to obtain some fundings from such cooperation to develop the system, but this is also contrasted with how such help could impact in the confidentiality around the system

> What would have been logical would have been international cooperation, but that brings us back to confidentiality and the way we have to handle ourselves. I [...] can't afford any more closed projects. This has to be something internal, where the public officials themselves develop according to the institutional needs [...] So, the idea of this new system was precisely to have institutional control (Interviewee 1-Minute 11:56).

# MAIN TRENDS AND RECOMMENDATIONS

It is reasonable to argue that the deployment of digital technologies in the context of public security is an undeniable reality in the Triple Border Area. Such a trend acquires different models across territories but it is also very similar at its core. To this date, there is an overwhelming positive understanding on behalf of civil servants that defend and promote these systems for different purposes. Coupled with the above, there is an interest from international cooperation programmes and private companies from the Global North and China that also promote such systems and based on different narratives.

The context of migration and border management is not exempt from such a trend. From systems that optimise the total surveillance of movement in border zones (both from people and goods), to programmes that allow for self- registration and based on FRT in certain borders, there is a pervasiveness element to the use of these technologies in Latin American that is reasonable to say will only grow.

This research constitutes an effort to characterise such reality in the Triple Border Area context, and connect it to other similar initiatives identified across the region. It is also an effort to narrate some of the strategies adopted by CSOs, academia and local governments in different jurisdictions to counteract such initiative and from a human rights standpoint. Below, you will find the main reflections from this research and regarding the deployment of both the Muralha Inteligente and Smarf programmes

**A. Efficiency Narrative**

First, it is important to highlight that in both programs the narrative that equates technology with efficiency is present. From the Brazilian perspective, not only Muralha Inteligente is entrenched in a bigger modernization plan, which includes other programs (Living Lab, Vila A, Fronteira Tech) within an investment mindset, such as the diversification of revenue by attracting private parties. Also, the interview explicitly states that technology is time saving and most of the arguments in the literature presented by the Ministry of Economy and RFB to justify the technologies employed in Fronteira Tech and Muralha Inteligente, respectively, are presented in a way that shows how new technologies can increase efficiency. This and the fact that no concern for the mitigation of possible human rights violations that could happen when using the technological equipment - explicitly mentioned in the FOIAs (no mapping of risks was made) and in the interview (this concern was not mentioned) - give hints that the use of technology in border security is seen as a synonym to progress.

The Paraguayan side has a complicated reality in terms of border management . It is reasonable to say that the DGM is indeed in need of optimising certain processes. Concretely, the fact that across borders they are forced to use different systems that can't interact between each other is indeed a problem in terms of general public administration processes. In such a context, efficiency and speed as an absolute value tends to acquire a central position in the justification for deploying digital technologies of different nature. Both the interviews and the FOIAs have entrenched in its answers the efficiency narrative, and by proxy they tend to disregard the human rights element that should be central when deploying facial recognition technologies of any sort. Lastly, it is important to highlight that at least in the case of the SMARF system, there

are protocols in place to act should the technology not work properly, and based on the direct intervention of a human representative. When thinking in facial recognition technologies, such involvement is crucial to mitigate unexpected biases and protect individuals from harms, and more importantly, ensure an institutional explainability.

**B. Lack of a Human Rights approach**

Both programs do not have a human rights impact assessment. As exhibited in the Muralha Inteligente main findings, the RFB's FOIAs show that there was no mapping of possible risks to human rights within the scope of Muralha Inteligente project and, as stated, the justification expose a misconception of impact assessment: the organs claimed that the project is still under development, which should mean that an effective impact of the technological solutions cannot yet be measured. Also, there is no privacy policy document, the contract that puts the agreement into force is not public neither available when asked for to PTI and although RFB and the Ministry of the Defense stated that Brazil's General Data Protection Law (LGPD) is the administrative act that regulates the collection and processing of this data, the answer to which legal basis supports these activities show a deep lack of knowledge of Brazilian data protection regime's rules.

The Paraguayan case is similar. There is a confusion from the DGM institution that justifies the lack of human rights impact assessments. Such justification is sustained and based on the narrative that because the PIRS- MIDAS already exists and its similar to the SMARF system, there is no reason to conduct an impact assessment of something that already exists. More importantly, the SMARF system does not have a privacy policy of any sort, and it does not appear that the DGM will incorporate privacy notices within the SMARF surroundings. This could constitute a low cost and effective policy improvement that could offer more guarantees to the public as to how the SMARF system operates and the tools that the DGM offer to data subjects on information of how its systems works. It could also be constituted as an active transparency measure that the migration office could adopt. Moreover, and at least on the Paraguayan side, there is a pressing need for a comprehensive personal data protection law that can guide public institutions on the minimum standards (I.e Data Protection Impact Assessments) they should adopt when implementing public policies with a personal data collection component, especially considering that in the case of SMARF, such system feeds itself with sensitive personal data.

On the other hand, when discussing FRT in the case of SMARF and others, it is crucial that authorities pay particular attention to vulnerable communities such as racial and ethnic minorities or members of non- binary and trans communities. Due to structural inequalities in the Paraguayan, it is important that the deployment of FRT does not end up harming such communities, and particularly in a delicate context such as the one of borders.

### C. (Lack of) Transparency

While some of the organs in both countries answered the FOIAs requests rather exhaustively, there is still a component of lack of transparency that characterises both researches, which sustains itself from the "national security deserves secrecy" argument. This is not to say that this claim is unfounded - national security issues and informations should be protected -, nonetheless for this argument to find grounds within a rule of law system, it is important that it is accompanied by the formal documents that assures that it is all being conducted in accordance with the legal safeguards. Documents that, as seen in the item above, were not provided nor publicised.

In regards to Muralha Inteligente, this lack of transparency becomes explicit in two moments: (i) the FOIAs answer's denial from PTI and Itaipu - the latter in a more subtle way, passing the responsibility to RFB, the former in an explicit way, due to the impossibility of disclosing sensitive information in national security issues (although not all the questions asked for any kind of sensitive information) and (ii) the denial for a second interview with someone from PTI because "[...] the discussion and disclosure of specific data and information regarding the project and its objects is prohibited by confidentiality clauses contained in the contracts with the other project participants." - although the questions that were to be asked were not disclosed before the interview request.

Notably and in the Paraguayan case, the national security argument was not very present. In general, there was an openness from public institutions in providing the information requested both via FOIAs and interviews. However, there is a transversal necessity in optimising the way public institutions offer explanations to the public and regarding the evolution of certain policies. In the case of the SMARF, there is almost a seven month gap of the system not working neither in the TBA nor in the Silvio Pettirossi International Airport. It is important that transparency policies that ensure traceability of digital systems acquired and deployed by the governments are put in place, thus fostering an ecosystem based on trust and confidence.

### D. International cooperation: A mix approached between borders

In the case of both SMARF and the in house biometric system, it appears that there is not much involvement of international cooperation to promote such systems. Rather, there is an institutional will to acquire independence in the maintenance of the current migration system that is under the control of the International Organisation for Migration. This is somewhat a novel finding in the sense of starting to find evidence across Latin American countries that promote some version of a digital sovereignty argument. This however should also be coupled with a human rights narrative that ensures the enjoyment of human rights by design.

In the Brazilian context, international cooperation was not a very strong trait. Nonetheless, the authorities responsible for the security programs seem to follow an international narrative that frames technology at the border as an efficiency policy. For instance, as mentioned in the FOIAs section, RFB and the Brazilian Ministry of Economy sent several pieces of literature to justify the existence of both FronteiraTech and Muralha Inteligente. Although focused on LAC countries, the literature is presented from a global perspective.

The recommendations highlighted in the section were the ones from Huawei and from the Inter-American Development Bank. Both present the employment of technologies in the border as efficient policies. The latter, for instance, argues that authorities in Latin America and Caribbean can improve competitiveness and economic growth by leveraging new technologies and innovations to boost digital transformation and streamline foreign trade logistics. This strategy, with the support of international organizations, would allow the optimization, automation and the digitization of customs and border processes. These recommendations gave examples of countries which are implementing projects to modernize customs and border management with IDB's support: Colombia, Peru, Nicaragua, Costa Rica and Panamá.

The recommendations brought by Huawei, on the other hand, stated that, if adopted correctly, an increase in the use of digital technologies and, thus, the creation of a greater automation in customs could make it more efficient and effective. This presents not only a narrative of efficiency, but also represents an incentive for Latin American countries to adopt this strategy and be a part of this trend. Nonetheless, the article highlights the importance of doing it in accordance with appropriate policies and legislation in place to address data privacy and IoT data exchanges between customs administration, which is not the case of neither of the systems studied in this report.

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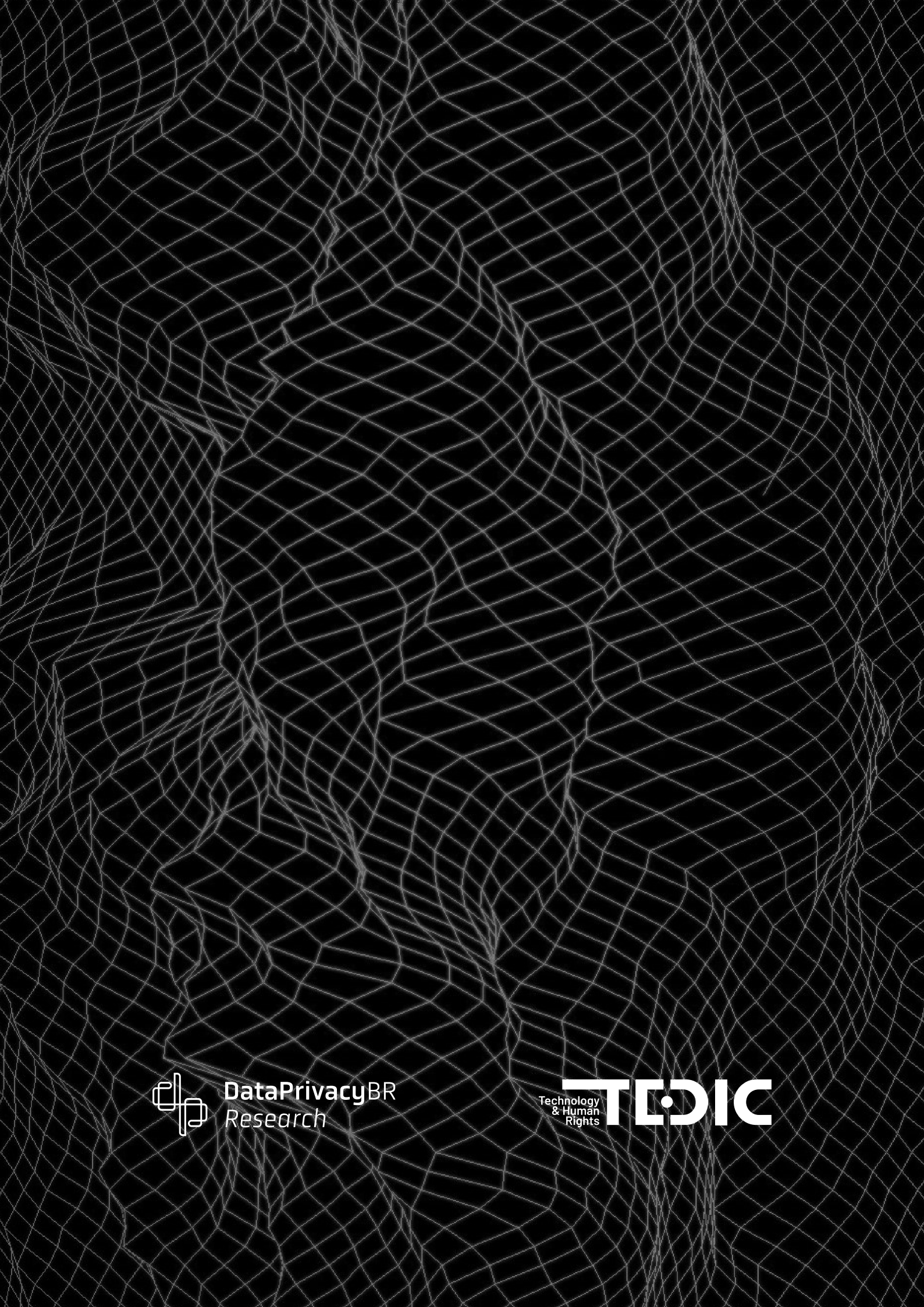
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