Boti: Study on the Natural Language Processing Chatbot of the Government of the City of Buenos Aires, Argentina

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BOTI: STUDY ON THE NATURAL LANGUAGE PROCESSING CHATBOT OF THE GOVERNMENT OF THE CITY OF BUENOS AIRES, ARGENTINA

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INTRODUCTION

In recent years, the growing expansion of Artificial Intelligence-based technologies has spurred serious concerns regarding the risks they pose to basic rights, especially privacy and personal data protection. This worry is heightened when governments adopt and depend on these technologies for increasing numbers of applications and purposes, including some that may appear anodyne but can turn out to be problematic, such as modernizing public administration and serving citizens by implementing chatbots.

A chatbot can be defined as a computer program designed to interact with users by simulating a human conversation via voice or text prompts, usually over the Internet (Adamopoulou et al., 2020). From the first programs developed in the 1960s to today, chatbots have evolved to be driven by algorithms that enable them to learn from interactions with users to optimize their future responses. Thus, chatbots are characterized by communication that uses conversational natural language processing, which leads to assigning them human features and perceiving them as anthropomorphic (Adamopoulou et al., 2020). While these characteristics are intended to improve user experiences, they may require users to share personal information with the chatbot to do so. This means that, in using chatbots, governments can also collect users' personal data without their knowledge, thus increasing privacy concerns (Ischen et al., 2020).

For their part, chatbots can display different attributes. Depending on their domain knowledge, they are called "open domain" (if they can respond on more than one topic) or "closed domain" (if they can only respond on a specific topic). They can also be differentiated by the service offered (interpersonal or intrapersonal, if they exist under the user's exclusive domain or not), goals (informing, chatting or completing tasks), input processing method and answer generation (rules-based, recovery or generative), human assistance as a component, and the building method (open source or closed platforms) (Adamopoulou et al., 2020).

Regardless of the attributes chatbots acquire, as they become increasingly incorporated into diverse areas, it is critical to research and develop measures to guarantee that they respect user data and comply with established security standards (Hasal et al., 2021). Following indications from the United Nations Office of the High Commissioner for Human Rights (UNHCR), generally speaking, government chatbots as an automated technology that collects and processes data pose certain critical risks to privacy and protection of citizens' personal data. First, there is the danger of misuse or unauthorized access to the data, which can potentially lead to harm for the individuals affected. Second, massive data collection can produce detailed profiles of users without their explicit knowledge, exposing them to possible situations of discrimination or manipulation. Further, the implementation of chatbots must be careful to ensure that the data are used legitimately and in compliance with the highest standards to guarantee protection against abuses and exploitation of sensitive data. Otherwise, there is a risk of perpetuating structural inequalities and disproportionately affecting the most vulnerable populations.

This is the context surrounding Boti, the chatbot created by the Government of the City of Buenos Aires (GCBA), capital of Argentina. Boti is a virtual assistant designed to answer questions and provide information to citizens that seeks to facilitate access to public services and improve communication between public administration and the population. In early 2019, Boti was officially launched as part of WhatsApp, the Meta messaging service used by 93.1% of Argentinians (Statista, 2023).

By the end of that year, Boti was recognized as the best Business Chatbot in the third edition of the Planeta Chatbot Awards, which pay tribute to the best Spanish-language conversational technology initiatives (Gobierno de la Ciudad de Buenos Aires, 2019). Later, during the COVID-19 pandemic, the chatbot was configured to provide public health information and offer updates on symptoms, infection test results, appointment management and vaccination certificates, among other services. This role led WhatsApp's director, Will Cathcart, to publicly praise the chatbot and show his pride in collaborating with the Buenos Aires city government (Cathcart, W. [@wcathcart], 2021).

In 2022, the City of Buenos Aires General Audit (AGCBA), an external control entity, conducted an exhaustive analysis of systems and processes related to the Boti chatbot, covering the 2021 calendar year. This analysis, published in March 2023, revealed significant achievements, but it also identified critical areas for improvement and highlighted the need for robust information technology (IT) policies for personal data processing and protection, emphasizing the importance of effective information and communications technology governance. In addition, the City of Buenos Aires

Ombudsman, the City's Personal Data Protection Act oversight body, responded to a citizen complaint in 2022 by undertaking an investigation that exposed significant problems in the access to and transparency of the chatbot's legal disclaimer, as well as in the protection of sensitive information such as COVID-19 test results. The resolution of this investigation included recommendations for improving the clarity and integrity of the legal disclaimer and ensuring the proper logging of databases in the corresponding registry, highlighting the importance of ethical and secure handling of personal data.

Boti's central role in communicating with citizens and providing services, as well as critical issues highlighted by the above-mentioned oversight bodies, demonstrate the need for detailed investigation into this chatbot's characteristics and operation from a human rights perspective. Along these lines, the current investigation, conducted from January to June 2024, has the goal of probing, analyzing and generating evidence on the Boti chatbot and its implications for privacy and data protection. The study focuses on the following dimensions: sociodemographic and regulatory context, accountability (especially in terms of transparency and external oversight), the role of private agents, and the principles of consent, purpose and security.

METHODOLOGY

The analysis of sociodemographic and regulatory dimensions was based on a broad review of literature and legislation, both local and national. Information gathering on characteristics of the chatbot's operations, as well as its internal management mechanisms, was based on open sources and a public information access request submitted to the GCBA. The vague nature of most of the answers led to a second request that, as of the study's conclusion, had not been answered.

This study included a series of interviews with various actors who participate in the chatbot's management, as well as with subject matter reference people: Pedro Alessandri (Assistant Secretary for the GCBA Smart City, with whom a virtual meeting was finally scheduled days before concluding the study and following several postponements by the official), María Julia Giorgelli (Subdirector for Personal Data Protection of the City of Buenos Aires Ombudsman Office), Marcela Pallero (Engineer specialized in Tele-informatics security, society and AI), Sofia Scasserra (Economist and Director of the AI and Society Degree Program of the Universidad Nacional de Tres de Febrero) and Mariano Caputo (Undergraduate degree in Social Communication Sciencies, UBACyT Doctoral candidate and author of several articles on chatbots and AI).

CONTEXT

Below, the sociodemographic and regulatory context is analyzed to better understand the environment surrounding Boti's implementation, who its target audience is, and which laws apply to it, directing particular attention to privacy and personal data protection.

SOCIODEMOGRAPHIC CONTEXT

The Autonomous City of Buenos Aires (CABA) has a population of 3,121,707 inhabitants, according to the most recent Census conducted in 2022 by the National Statistics and Census Institute (INDEC). Thus, CABA is one of the most populated jurisdictions in the country, representing 7.4% of the total population. According to the 2023 Global Liveability Index, Buenos Aires was the city offering the best quality of life in Latin America, standing out in the areas of education, culture, health and infrastructure. In terms of Internet access, CABA has witnessed significant growth in recent years. According to the last census, 94% of the city's inhabitants have Internet access, while in the previous census of 2012, it was 72%. In turn, currently around 80% of the city's population has a computer or tablet and 90% have cell phones, compared to 81% in 2012.

The growth in the latter figures is matched by the evolution of the Boti chatbot and GCBA use statistics. The first GCBA chat was launched in 2012 and managed by a human team that processed an average of 15,000 conversations per month. At this stage, users could submit queries about paperwork, request appointments and submit complaints via both the website and Facebook. In 2014, the first GCBA chat using Artificial Intelligence was introduced, significantly improving the service's efficiency and immediacy. Around 2015, the average number of daily conversations increased to 2,000, for a total of more than 60,000 per month. On February 23, 2019, the City of Buenos Aires officially launched Boti on WhatsApp, the messaging app most used by Argentinians, and the number of monthly conversations doubled as compared to the prior year. With COVID-19's arrival in 2020, Boti incorporated new functions to relay relevant public health information, offering updates on symptoms, prevention, test results, appointment scheduling and vaccination certifications, among others. In 2020, the number of conversations per month rose to more than 600,000 and one year later, that figure was multiplied by 10 for a total of over 6 million. All this, in a scenario of initial isolation and later mandatory preventive social distancing that lasted from March 2020 to March 2021. During the first quarter of 2022, Boti reached its historic maximum of 26 million interactions per month, becoming the main channel of communication

between the GCBA and its citizens. However, the numbers later fell to between 5 and 2 million conversations per month (Gobierno de la Ciudad de Buenos Aires, 2022).

REGULATORY CONTEXT

Analysis of regulations and legal decisions shows a broad range of elements that could be relevant to this study in terms of privacy and personal data protection. Furthermore, national and sub-national rulings define a huge regulatory universe that could have implications for other rights. The main legal instruments governing personal data protection in Argentina and in the Autonomous City of Buenos Aires are presented below. Then, the elements selected to guide the investigation, which will be examined in detail in the study's last section, are introduced.

In Argentina, personal data protection is backed by constitutional provisions, principally in Article 43 of the National Constitution. This article establishes the right to personal data protection as part of the right of all people to access information held by the State, as well as to be familiar with it, update it and correct it. In addition, the article guarantees individuals' right to request the removal or confidentiality of their personal data. The National Constitution also establishes the right to privacy in Article 19, which protects a person's private life and prohibits any arbitrary interference in their life, family, home, correspondence or communications. This constitutional right provides additional support to personal data protection in Argentina by recognizing the importance of safeguarding individual autonomy. Personal data protection is regulated at the national level mainly via Law 25,326, known as the Personal Data Protection Act (LPDP), enacted in 2000 (Ministerio de Justicia de la Nación, 2000). This law sets forth the basic principles for processing personal data and creates what is known today as the Access to Public Information Agency (AAIP), the oversight authority responsible for enforcement. The LPDP establishes that personal data processing must be done with the data subject's consent and for specific, legitimate and defined purposes. Likewise, it guarantees the right to access, correction and elimination of the personal data by the data subject. In addition, it creates obligations for those who handle data processing, such as adopting appropriate security measures to protect the information.

In the City of Buenos Aires, the legal framework for personal data protection is based on the CABA Constitution, which in Article 12 recognizes and guarantees people's right to intimacy and privacy. This constitutional recognition lays a solid foundation for protecting the personal data of citizens in Buenos Aires, in alignment with international human rights standards. The Personal Data Protection Act No. 1.845, approved in 2005,

is the main law regulating personal data processing in the City of Buenos Aires. This law sets forth the principles and rules that both public and private entities must follow in processing citizens' personal information. The law's most relevant aspects include the definition of personal data, data subjects' rights, the obligations of those who are responsible for data processing, and the security measures that must be implemented to protect information.

The instruments presented up to this point offer a large number of elements for extensively analyzing Boti's implications. However, in an attempt to keep the study's parameters manageable, three key international principles of personal data protection, which are reflected in national and sub-national legislation, were selected. These will be addressed in more detail in the last section of this study and are summarized as follows:

Purpose. This principle establishes that personal data must be gathered for specific, explicit and legitimate purposes, and the data must not be processed in a manner that is incompatible with those purposes. This means that they can only be used for the purposes for which they were collected, and any other use requires the data subject's consent. It is important that those responsible for data processing clearly inform data subjects of the purpose of the processing and limit use of the data to that specific purpose.

Consent. The express, informed consent of the data subject is required for processing the data, unless there is an exception provided for by law. The consent must be free, specific, informed and granted unambiguously. Informed consent means that the data subject must be fully informed of who is collecting the data, for what purpose they will be used, what kind of data are collected, how they will be stored and protected, and any other information relevant to processing their personal data. The consent must be specific to each purpose of the processing, and it must be possible to revoke the consent at any time by the data subject.

Security. This principle establishes the obligation to implement appropriate technical and organizational measures to protect personal data against unauthorized access, alteration, dissemination or accidental or illegal destruction. Data security means protecting the confidentiality, integrity and availability of the personal data, and protection includes the adoption of access controls, data encryption, monitoring of processing activity, personnel training and other measures. Data processing managers must regularly assess the risks to data security and take necessary measures to mitigate those risks and guarantee the protection of personal data.

BOTI: CHARACTERISTICS, MANAGEMENT MECHANISMS AND MAIN STAKEHOLDERS

The Government of the City of Buenos Aires has opted for technological innovation as a central strategy of its administration. Through the Secretariat for Innovation and Digital Transformation, a series of key objectives have been established along these lines, including: a) Identifying, strengthening and managing the development and implementation of new products, processes and services based on emerging technology to facilitate the transformation and modernization of the State in different areas of government; b) Promoting streamlined process design, digitalization and coordination of policies for transforming administrative management within the GCBA, encouraging the adoption of new working methods, the use of digital tools and systems, and process optimization; and c) Participating in the design and coordination of transformation and modernization policies in diverse areas of government and proposing related regulations (Gobierno de la Ciudad de Buenos Aires, 2023).

One of the most noteworthy milestones for the Secretariat for Innovation and Digital Transformation has been the adoption of the first Artificial Intelligence Plan, known as "Ciudad Futuro" [Future City], in 2021. The objective of this plan is to maximize the benefits that AI can offer the city, consolidating its use in key areas and promoting its development with a focus on people (Gobierno de la Ciudad de Buenos Aires, 2021). The Plan's biggest challenges, according to GCBA objectives, include establishing conditions for developing AI in the City and leveraging AI use to benefit citizens and urban development. The Plan's principles include privacy and establish that the collection, use, storage and elimination of personal data must be done in compliance with appropriate governance mechanisms and protocols and ensure the data's protection and correct use, pursuant to legal frameworks for data protection (Gobierno de la Ciudad de Buenos Aires, 2021). In addition, the document sees a specific challenge in the appropriate handling of data, since AI needs to use personal data to function because the training and operation of its algorithms depend on massive quantities of information. The Plan thus concludes with the statement that it is essential to analyze privacy and security issues given the potential harm that the abuse of these technologies can cause people. In the context of the GCBA 2021 Artificial Intelligence Plan, the Boti chatbot is highlighted as one of most important projects, even though its launch took place in 2019.[1]

1 Gobierno de la Ciudad Autónoma de Buenos Aires. "Plan de Inteligencia Artificial." https://buenosaires.gob.ar/jefaturadegabinete/innovacion/plan-de-inteligencia-artificial (consulted in July 2024)

Currently, Boti falls within the purview of the Office of Digital Channels, which also manages the GCBA website, and comes under the Smart City Sub-Secretariat, headed by the information systems engineer Pedro Alessandri, who was recently named to the post and who formerly worked as director of Digital Citizenship. The sub-secretariat, which comes under the Secretariat for Innovation and Digital Transformation, is also in charge of the Office of Digital Citizenship and the Office of Citizen Services Systems.[2]

Boti did not arise spontaneously; rather, its history goes back to 2012, when citizen interaction via a chat exclusively managed by human agents started (Gobierno de la Ciudad de Buenos Aires, 2022). In 2014, the chat incorporated Artificial Intelligence, and the number of citizen interactions grew noticeably, reaching 40,000 conversations with around 300,000 users. The most frequent queries included information on traffic tickets, obtaining copies of birth certificates, drivers license processes and Consumer Defense complaints. In 2015, the monthly conversations rose to 60,000, covering topics such as separating trash and the Ecobici program. During this time, interaction with citizens took place over four channels: e-mail, the 147 hotline, the BA 147 cell phone app and the virtual chat using Artificial Intelligence, with the possibility of being forwarded to human agents. By 2018, the City Government had three different chatbots on its web, Facebook and Telegram platforms. To unite these chatbots into a single official channel, Boti was created in 2019 and rapidly became the main means of consultation, capturing 80% of all communications. In January 2022, Boti reached a historic record of interactions, where "COVID test result" was the most requested topic, and it became the GCBA's main digital communication channel, along with the website.

According to the GCBA report "Boti. El chatbot de la Ciudad" (2022), Boti is different from other chatbots thanks to its open-domain nature, which enables it to use Artificial Intelligence systems to interact with external systems and provide specific answers to queries on more than one topic, which defines it as a conversational bot. Given that WhatsApp is the messaging platform most used in Argentina and that it has end-to-end encryption, making it impossible for third parties to intercept the messages, the City Government chose it as Boti's communication channel. It was thus transformed into the first government chatbot in the world to do so, as highlighted by the administration itself (Gobierno de la Ciudad, 2022). To start a conversation with the chat, citizens must save the number (+54 9) 11-5050-0147 in their phones and then they can ask all the questions they want. It is also possible to contact the chatbot via the GCBA website and

2 Gobierno de la Ciudad Autónoma de Buenos Aires. "Subsecretaría de Ciudad Inteligente." https://buenosaires.gob.ar/secretaria-de-innovacion-y-transformacion-digital/subsecretaria-de-ciudad-inteligente (consulted in July 2024)

from the WhatsApp web application, with no need to save the contact number. Boti's functions evolved to offer a broad range of citizen services in areas such as health, urban mobility, aid and support, complaints, information and queries, citizen administrative processes and wellbeing. The chatbot now even offers information linked to the history of its own creation.

According to the report "La atención de gobierno en la era digital: El caso Boti en la Ciudad de Buenos Aires" published in 2023 by the Center for Evaluation of Evidence-based Policy (CEPE) of the Universidad Torcuato Di Tella, during the pandemic Boti became the main source of official information on symptoms, prevention, COVID-19 case data management, test results and, later, information on vaccination plans. The GCBA's first step for this, according to the report, was to adapt the chat's main menu to include information on the disease, prevention measures, anti-flu vaccination campaigns, blood donation, programs for the elderly, location of health centers, and cultural, educational and recreational activities to do at home during quarantine. This content was updated as new measures were rolled out. In addition, the digitalization of City Government administrative processes forged ahead, making it possible to check on paperwork using WhatsApp. According to the report, Boti also made it possible to redirect queries to health centers, depending on urgency or severity. In turn, an Artificial Intelligence system called IATos, developed and implemented by the Secretariat for Innovation and Digital Transformation, complemented coronavirus detection efforts using Boti. It worked over a neural network that can classify voice, breathing and coughing sounds, analyzing audio clips of coughing sent by WhatsApp to detect possible COVID cases with an effective prediction rate of 86%. Furthermore, Boti was configured to coordinate testing, delivery of results and certificates, monitoring positive cases and close contacts, and later, managing vaccination appointments and digital certificates. Medical triage, symptom monitoring and testing and vaccination strategies were supported largely by Boti.

However, the government faced significant challenges, such as the channel's collapse when vaccination appointments were activated or in periods of high demand for results, such as during end-of-year festivities. The WhatsApp infrastructure was unprepared for handling such a massive volume of responses in a short time. Boti supported up to 200 messages per second, and surpassing this capacity caused the channel's breakdown, with a long wait time to restore it (Gertner et al., 2023). In early 2022, the chatbot offered more than 70 different administrative processes, and in 2023, another 15 were added. These new processes include the re-printing of driver's licenses, obtaining license legality certificates, requests for new copies of national identity documents and programming medical appointments in neighborhood health centers in Buenos Aires.

BOTI'S TECHNICAL CHARACTERISTICS

Regarding Boti's characteristics and attributes, the GCBA in "Boti. El chatbot de la Ciudad" states that it is a generalist bot, in contrast to bots with specific goals. As mentioned above, Boti offers a wide range of answers regarding the City's services, administrative processes and events, due to its open domain nature. A distinguishing feature is its ability to interact with external systems and offer specific answers on government services and weather conditions, for example.

ARTIFICIAL INTELLIGENCE USE

As previously stated, the first use of Artificial Intelligence in a City chat (chat 147) took place in 2014, with an automated question answering and semantic interpretation system. This system facilitated understanding during information and concern interactions with users.

However, with the arrival of Boti in 2019, the process improved and was streamlined through the adoption of a natural-language understanding engine based on Artificial Intelligence and Machine Learning. Thanks to these technologies, Boti can not only conduct predefined actions, it also has the ability to learn and adapt to each user. Although it is not possible to intervene in the internal processes of this Artificial Intelligence engine, the GCBA states that the team works continuously to ensure Boti's optimal functioning, keeping obstacles and confusion to a minimum (Secretaría de Innovación y Transformación Digital, 2022).

In terms of natural language processing, the bot operates on four levels: "understood, disambiguation level 1, disambiguation level 2 and not understood" (Secretaría de Innovación y Transformación Digital, 2022. Boti. El chatbot de la Ciudad). The main function of the bot's artificial intelligence is its message comprehension engine, which works via the Google Speech to Text platform. This platform artificially synthesizes human speech, analyzing diverse aspects of the conversation. To improve this engine, the AI algorithms receive constant training, using each interaction and the data obtained from it as feedback. In this way, Boti can identify if a user is sending a voice message, initially determining the length of the message to establish whether it is a short audio message. If so, it proceeds to analyze the content. However, if the audio is too long, Boti cannot interpret the query and will ask the user to re-send it with a shorter length. In addition to voice processing, the bot can also use Artificial Intelligence for image recognition, using the Microsoft Azure service. This technology facilitates automatic

object detection, such as the identification of poorly parked vehicles. To improve its performance, the bot must be trained through the uploading and labelling of images, which increases its accuracy in terms of pixel and pattern analysis to recognize specific objects in the images (Secretaría de Innovación y Transformación Digital, 2022).

INTEGRATIONS

Another crucial element of Boti's intelligence lies in its integration ability to connect to a diverse range of available web services. These services may be developed both in collaboration with government areas and externally, as long as they are openly available. The purpose of these services is to offer personalized answers based on information provided by the user.

The connection between the chatbot and web services, as well as obtaining the parameters needed for processing and presenting the final answer to the user, is done through the definition of a conversational flow. In this process, the bot formulates a series of questions for the user in order to collect all necessary information before calling the corresponding service. Once it receives the answer, the bot determines how it will be shown to the user using a series of predetermined messages. For example, a user could ask Boti if it is legal to park in a specific location in the city. To answer this question, the chatbot connects to the georeferenced CABA map using the API for parking rules developed by the transportation team and the Geographic Information Systems Unit. Using this information, Boti verifies the address provided by the user and offers the specific information provided by the map.

The process of incorporating new services into Boti follows several stages which are undertaken in collaboration between the Secretariat for Innovation and Digital Transformation and the corresponding area. In the survey stage, information is received about the area's expectations in terms of the bot, along with initial technical details needed for interacting with the relevant systems. These data are used in the Conversational User eXperience (CUX) stage to design the conversational flow, taking into account Boti's identity and personality attributes. The development stage is next, which means implementing the conversational flow in consideration of its interaction with the defined services. Then, quality control tests are performed to ensure the proper operation of the flow and the integrations. These tests are done by both the internal team and the corresponding area. Finally, the implementation is rolled out with a press release from the area. Any post-implementation modifications are coordinated through the Secretariat for Innovation and Digital Transformation Help Desk.

DATA PROTECTION MECHANISMS

To ensure security and confirm identity in certain scenarios, such as reporting a poorly parked vehicle, contacting a 147 operator or checking on pending fines, Boti requests the user's personal data to respond to their request or help them with their paperwork. In these situations, the identity check is performed using the miBA (miba.buenosaires.gob.ar) platform, a registration and log-in tool used in all Buenos Aires City Government apps. With a single username registered with miBA, citizens can conduct administrative processes online, request a taxi using the BA Taxi official platform or, in this case, be identified on Boti to receive assistance.

Regarding data protection, the GCBA reports that it has established infrastructure to ensure secure access to users' personal information. According to the Secretariat for Innovation and Digital Transformation (2022), only designated operators for each referral are authorized to access this information in order to resolve the query or requested process. The above information has been supplemented with answers provided on May 8, 2024 by the Government of the City of Buenos Aires to the public information request and in the interview with Pedro Alessandri, Assistant Secretary for the GCBA Smart City, conducted as part of this study.

Through the access to information request and interview and in regard to the data collected, the GCBA communicated that Boti enables two kinds of interactions. On the one hand, users can access general information with no need to provide personal data. For example, they can ask about the city's "Tourism Plans" or cultural events calendar without identifying themselves. On the other hand, to conduct administrative processes or personal tasks, Boti needs to identify the user to address their request specifically. In these cases, the personal data necessary for completing the required action are requested. This process is done following the user's acceptance of the service use terms and conditions, which, as we will analyze later, could be especially problematic. The data collected could include document type and number, sex and other specific details depending on the task, e.g., real-time location to get information on where to park. It is important to stress that many of Boti's services refer to the miBA service which can be used as an identification method with no need to provide additional personal data. However, to create an account on the miBA service, the user must provide at least an e-mail address, a personal identification number (Unique Code of Labor Identification, foreign passport or certificate of precarious residence), date of birth, sex, and full name.

In terms of communication channels, Boti is available via WhatsApp and webchat on www.buenosaires.gob.ar. On WhatsApp, the user's phone number is used for

identification, while on the webchat, the conversation is recorded using a generic ID generated by the platform to protect the user's privacy.

Regarding security measures adopted, the GCBA indicated in the interview and the access to information request that the logging of data collected by Boti in the Ombudsman Office Center for Personal Data Protection should be emphasized. This agency, appointed by Law No. 1.845, acts as the oversight body responsible for supervising the proper handling of the City's public-sector personal information databases, ensuring the preservation and confidentiality of citizens' sensitive data. Further, the GCBA mentioned that strict confidentiality obligations are established for contractors, agents, and employees in relation to any personal data they process, and that they have set up a warehouse for encrypted conversations.

In technical and organizational aspects, the GCBA states that it takes all necessary measures to ensure the security and confidentiality of the data collected. These measures are based on the stipulations of City of Buenos Aires Law No. 1.845, as well as the General Computer Security Policies provided by the Information Systems Agency (ASInf), supported by specific resolutions. In addition to complying with local laws, the GCBA states that it guarantees compliance with national legislation and all relevant personal data protection regulations. These include the National Personal Data Protection Act No. 25.326 and its statutory provisions, as well as any other law that the competent authorities may establish in the future. As will be seen later, however, these statements turn out to be problematic due to doubts cast regarding full compliance with the principles of purpose, consent and security.

In both the access to information request and the interview, the question was posed regarding whether the personal data gathered were shared with third parties and if so, for what purpose. In response to this concern, the GCBA reported that Boti is a conversational channel that refers user requests to other areas of government as necessary depending on each area's competencies, using a distinct protocol for gender-based violence complaints. Information for specific administrative processes is recorded in GCBA process management systems (such as the Digital Processes System (STD), the Remote processes (TAD) platform, or in spaces of the area responsible for handling the process), so that the competent area may address the request. According to the GCBA, all information provided by users is covered and protected by confidentiality agreements and obligations derived from professional secrecy. This duty remains even after the relationship and/or service provision ends. User information can only be provided to third parties if it is required by legal authorities or for any other existing legal requirement, pursuant to the

exceptions stipulated in Article 15 of the Autonomous City of Buenos Aires Data Protection Act No. 1.845.

The GCBA affirms that data provided by users is collected solely for the purpose of implementing the features offered by the Boti chatbot. In its response to the access to information request, the GCBA indicated that as established in the terms and conditions (T&C) for using the service: "Data provided by the user shall be stored until the previously established purposes have been fulfilled. After that time, any identifying data gathered shall be separated, leaving only aggregate information in our databases." In addition, the GCBA states that, in exceptional situations, all the information obtained could be stored for an extended period, depending on "the merit, opportunity and appropriateness deemed by the Administration; [the information] is subject to a legal requirement or obligation; government investigation or related to possible breaches; to avoid damages and harm" (GCBA, 2024).

ROLE OF PRIVATE AGENTS

In 2020, the office of the GCBA Chief of Cabinet charged the Secretariat for Innovation and Digital Transformation, via the Smart City Sub-secretariat, with the task of improving and expanding the services offered by Boti. As a result, formal processes were established, and specifications were drafted. The criteria for their approval are identified by the codes PLIEG-2020-12796736-GCABA-SSCIUI // IF-2020-12730528-GCABA-DGCIUD (Gobierno de la Ciudad Autónoma de Buenos Aires, 2020a).

The objective of the technical specifications approved under Resolution No. 1/SSCIUI/20 was the procurement of "Service for Assisted conversations of the Chatbot BA asset ecosystem." The highest-priority requirements included a fixed-bundle conversation service (from 0 to 500,000); an individual excess conversation service (from 500,001 to 900,000); and an excess conversation service via additional fixed package (from 900,001 to 1,400,000). The procurement documents emphasized that the solution should facilitate access to auditing processes, promote actions to improve the quality of citizen services and promote modernization of the GCBA using integration with other solutions. They also specified the need to comply with policies set forth in Resolution No. 177/ASInf/2013 and its supplement No. 239/ASInf/2014, as well as to consider the infrastructure, databases and language specified in the documents (Gobierno de la Ciudad Autónoma de Buenos Aires, 2020c).

The Smart City Sub-secretariat has received a variety of technological services, some provided by the Information Systems Agency (ASinf) and others procured externally. The Boti-related services agreed to with external suppliers are described below.

The first service, documented in Electronic File No. 2020-10004520-GCABA-DGCCYA, refers to the consultancy for assisted conversations of the Chatbot BA assets ecosystem. This direct procurement was done with the Botmaker S.R.L. company for a total of 16,212,240 ARS[3] and a 12-month term (Gobierno de la Ciudad Autónoma de Buenos Aires, 2020d). Later, the continuation and extension of the contract for an additional six months was authorized, for a total of 17,112,020.42 ARS (Gobierno de la Ciudad Autónoma de Buenos Aires, 2021).

The second service, recorded in Electronic File No. 2020-17981732-GCABA-DGCCYA, addresses the evolutionary maintenance of the Chatbot BA assets ecosystem. This direct procurement, also with Botmaker S.R.L., had a value of 9,047,300.00 ARS and 12-month term (Gobierno de la Ciudad Autónoma de Buenos Aires, 2020e). Finally, the third service, documented in Electronic File No. 2021-25211529-GCABA-DGCCYA, refers to the development, corrective maintenance and support of the Chatbot BA assets ecosystem. This direct procurement, once again with Botmaker S.R.L., had a value of 20,399,000 ARS and a 12-month term (Gobierno de la Ciudad Autónoma de Buenos Aires, 2021b), with a later expansion of 20.60% for a total of 4,200,000 ARS (Gobierno de la Ciudad Autónoma de Buenos Aires, 2021c). Then, via Resolution No. 5-GCABA-SSCIUI/22, Open Purchase Order No. 2051-0255-OCA21 was expanded by 29.32%, which came to a total of 4,200,000 ARS (Gobierno de la Ciudad Autónoma de Buenos Aires, 2022). In terms of the fourth service, documented in Electronic File No. 2021-26811106-GCABA-DGCCYA, it was approved and awarded by direct procurement under Resolution No. 29-GCABA-SSCIUI/21 on October 18, 2021. This involves the service of Consultancy for Assisted Conversations of the Chatbot BA assets ecosystem, contracted with Botmaker S.R.L. for the amount of 47,833,377.60 ARS and a 12-month term (Gobierno de la Ciudad Autónoma de Buenos Aires, 2021d) with the signing of Open Purchase Order No. 2051-0254-OCA21 on October 22, 2021 (Gobierno de la Ciudad Autónoma de Buenos Aires, 2021e).

Botmaker S.R.L. is a company legally incorporated in 2016 (Cuit Online.com, 2024). As seen on its website, the company has offices in Argentina, Brazil, Colombia, the United States and Mexico. It operates in over 35 countries and develops artificial intelligence to offer personalized conversational solutions. Furthermore, the company clarifies that

3 All amounts are expressed in Argentinian pesos (ARS).

it operates with data protection processes and in compliance with legislation, although it bears mentioning that during this study an attempt was made — unsuccessfully — to schedule an interview with the company's representatives to learn more.[4]

Later, in 2022, the GCBA conducted a minor procurement with the Werden IT SAS company for a Consulting Service for the design, implementation and infrastructure of the "Boti Mundial" chatbot in the amount of 6,000,000 ARS (Electronic File No. 2022-33051603-GCABA-ASINF). That same year, the GCBA via Electronic File No. 2022-29879819 awarded via public tender a contract in the amount of 91,988,500 ARS to The Black Puma SA. This was for "Consulting Services for the Exploitation of MeC; Bkl; CoD; TyP; Boti Attributes and Updating the Parcel-level Digital Token and CEP Token Development, for the Data Warehouse and Automation of the GCABA Operations Monitoring process" to undertake an appropriate data modeling (logical and physical) structuring process for the governance and management of data as strategic assets of the Government of the Autonomous City of Buenos Aires. The service was procured for the Sub-secretariat of Evidence-based Public Policies which comes under the Secretariat for Innovation and Digital Transformation, for a 12-month term.

EXTERNAL MONITORING: AUDITS AND INVESTIGATIONS BY OVERSIGHT AGENCIES

Up to this point, Boti's main characteristics have been presented, as according to information provided by the Government of the City of Buenos Aires, both that published in open sources and what was gleaned from the interview and the public information request response. But there are also some points stemming from official information that contribute to identifying a few critical areas for privacy and data protection in the management of this chatbot. The following analyzes aspects related to critiques issued by the City of Buenos Aires General Audit and the City Ombudsman.

AUDIT REPORT: OBSERVATIONS ON MANAGEMENT MECHANISMS AND EXTERNAL PROCUREMENT

As mentioned in the introduction, during the second half of 2022, AGCBA conducted an analysis of the systems, processes, services and technologies that ensure the Boti chatbot's operability. The audited period covers calendar year 2021, and the report was

4 For more information, see: https://botmaker.com/es/ (consulted in July 2024)

published in March 2023. In an exhaustive assessment covering multiple dimensions of the chatbot's operation and processing, a thorough study has been undertaken in compliance with governance and management standards outlined in the 2019 COBIT Framework, as well as the regulations and recommendations set forth by ASInf, pursuant to Resolution No. 177/ASInf/13 and its expansions (Auditoría General de la Ciudad de Buenos Aires, 2023).

One of the main areas identified for improvement is the need to formalize the administrative procedures associated with the Boti chatbot. The audit states that the absence of a clearly defined administrative structure could have impact on the operational efficiency and transparency of resource management. On this point, it is worth noting that the difficulties in identifying the areas that intervene in Boti's management within the Secretariat for Innovation and Digital Transformation and their responsibilities are ongoing. Likewise, the audit detected gaps in the documentation related to allocation of financial resources and budget for the platform, raising questions about financial management and associated cost controls.

Regarding the management of services and operational agreements, the audit identified shortcomings in the presentation of service-level agreements with ASInf, as well as in the supporting documentation for confidentiality agreements with the chatbot's external developers, such as Botmaker S.R.L. The audit did recognize the clear commitment to security and service availability via the implementation of continuity and recovery tests, although it emphasized the need for greater transparency and more detailed documentation on this point to ensure the robustness and reliability of the system in contingencies. In conclusion, the AGCBA highlighted that the processing and storage of massive volumes of data in the services provided requires the establishing and constant review of IT policies that ensure the security and protection of the data processed. To reach this goal, the audit states that it is essential to implement effective governance and management of information and communications technologies (Auditoría General de la Ciudad de Buenos Aires, 2023).

For his part, during the interview conducted with the GCAB Smart City Assistant Secretary, he stated that the GCAB had implemented the necessary measures for addressing the audit's observations. However, throughout this investigation, it has been impossible to locate official documentation that shows which measures have been deployed or how the efforts made have been undertaken.

OMBUDSMAN OFFICE INVESTIGATION: OBSERVATIONS ON PERSONAL DATA MANAGEMENT

In addition, in 2022 the City of Buenos Aires Ombudsman Office, the personal data protection authority in the City of Buenos Aires, conducted an investigation in response to a complaint filed by Ms. Patricia Farías regarding operation of the City's chatbot. After a detailed analysis of the relevant facts and considerations, it issued a resolution that attempts to address the concerns expressed by citizens and to ensure compliance with data protection regulations in the use of this digital tool (Defensoría del Pueblo de la Ciudad de Buenos Aires, 2022).

Ms. Farías expressed her concern about the lack of availability of a legal notice on entering the "Boti" virtual assistant on the Buenos Aires official Government website. Further, she mentioned that, using this chatbot, anyone with knowledge of a third party's national ID and phone number could obtain sensitive information, such as COVID-19 test results. Following an analysis by the Personal Data Protection Center of the Ombudsman Office, the Office for Digital Channels of the Government of the Autonomous City of Buenos Aires was requested to correct the link to the "Boti" legal notice and provide detailed information on the kind of personal data collected, the purpose, and the security measures adopted, among other relevant aspects. In response to this request, the Office provided information on the corrections made to the legal notice link and listed the available digital communication channels, as well as the security measures implemented in the chatbot. It was emphasized that sensitive data, such as COVID-19 test results, are only accessible via WhatsApp and solely if the query comes from the device whose telephone number matches that registered during the test.

The Ombudsman Office resolved to request a reformulation of the legal notice to ensure full and clear information on the "Boti" chatbot's operations. In addition, they urged consideration of the recommendations on use of Artificial Intelligence-based tools and personal data processing in the context of COVID-19, as well as logging all databases containing personal information with the corresponding Registry. The resolution set a deadline of thirty days to complete these actions, pursuant to the legislation in force in the City of Buenos Aires.

SOME REFLECTIONS ON BOTI'S TERMS & CONDITIONS

Although the GCBA states that they have responded to the Ombudsman's directives, it has not been possible during this investigation to find official documentation providing

proof. In this vein, it is useful to analyze the state of the Terms & Conditions under which Boti is currently managed.

The Boti legal notice establishes the conditions and terms of use for the chatbot offered by the Government of the Autonomous City of Buenos Aires (Gobierno de la Ciudad de Buenos Aires, n.d.). Emphasis is placed on the chat being a voluntary channel for addressing requests and that data provided by users can be considered personal and/or sensitive data according to the City's Data Protection Law. Users have the right to correct, update or eliminate their data, but they are warned that eliminating the data means it will be impossible to continue using the service. The Terms & Conditions establish that the GCBA Ombudsman Office is the oversight body for data protection, and options are provided for filing questions or concerns.

By continuing to use the chatbot, users grant their consent for the GCBA to access, process and store their data in order to fully implement the service's features. The document states that the purpose of data collection is to execute the features offered by Boti and to produce statistics for improving the tool. User data, it states, will be stored until the established purpose has been fulfilled, and then the data will be decoupled such that only aggregate information will be preserved. It emphasizes that, under exceptional circumstances, the information could be kept for an extended period at the discretion of the Administration, as mentioned in the preceding section (GCBA, n.d.).

The legal notice also describes the security and confidentiality measures applied to the data collected, as well as the GCBA's responsibilities in their processing. It clarifies that the GCBA will not be liable for unlawful interception of user devices by unauthorized third parties affecting the security of the stored information. Finally, it establishes the applicable jurisdiction and law, as well as user acceptance of receiving information related to City services over a range of media (GCBA, n.d.).

PURPOSE, CONSENT AND SECURITY

As mentioned, Boti's implementation by the GCBA raises several concerns in regard to privacy and protection of personal data. In this section, the implications for the principles of purpose, consent and security will be examined.

PURPOSE

The principle of purpose is one of the fundamental pillars of personal data protection. It establishes that personal data must be gathered for specific, explicit and legitimate purposes, and the data must not later be processed in a manner that is incompatible with those purposes. This standard means that any data collection form, whether physical or digital, must clearly specify the purpose of the collection, among other details. For example, if data are collected for a newsletter subscription service, this must be the sole purpose for which those data are used, unless new consent is obtained for other uses. Likewise, processing managers must ensure that data subjects are informed of the exact purposes of the collection and obtain their explicit consent for those purposes. One of the experts interviewed locally states that the principle of purpose arises from Article 6 of Law No. 1.845 on the quality of personal data and must be strictly complied with by the State as this is found in a core section of the law, such as the general principles. Therefore, any behavior affecting this principle should be considered a violation by the State. Faced with a need to have an efficient government, the expert maintains that the use could be authorized for compatible purposes, but even in these cases, any transfer must be done to the extent permitted and the data may not be used for just any purpose.

In the context of Boti, it is critical to analyze how this principle is handled. Below, the brief message in this regard appearing in the legal notice is transcribed:

> PURPOSE OF DATA COLLECTION: Data provided by users are collected solely in order to implement the features offered by the Boti chatbot, as follows: to create a channel of communication between the GCABA and users. Likewise, following a data anonymization procedure, the data will be used to generate statistics and metrics with the goal of analyzing and improving the "Boti" chatbot tool.

Boti states that it complies with this principle by collecting data solely to facilitate communication and access to government services. However, it is essential that these purposes be clearly communicated to users so that there is no secondary use of the data without the data subjects' explicit consent. The legal notice attempts to establish the bases for collection, storage and use of users' personal data. Nevertheless, a careful analysis reveals that the notice contains several important shortcomings in the context of the principle of purpose. These are:

a. Lack of specificity in the purpose of data collection. The Boti chatbot legal notice mentions two general purposes: 1) Creating a channel of communication between the

GCBA and users and 2) Generating statistics and metrics following an anonymization process. However, the purposes are too broad and vague. How the data will be used in the context of communication is not detailed, nor is the type of statistics that are to be obtained and their relevance for improving the chatbot explained. It is critical for each data processing purpose to be specified with greater clarity and precision; for example, describing how the personal data will be used for communication (such as follow-up on queries, answers to specific requests, etc.) or explaining the type of statistics that will be generated and how they will directly contribute to improving the service.

b. Anonymization process and use of anonymized data. The notice mentions the use of anonymized data for statistics and metrics, but it does not provide details on the anonymization process. Anonymization must be clearly explained to assure users that their personal data will not be reused in an identifiable way. A best practice should describe the data anonymization process, including the techniques used and how it will be guaranteed that the data cannot be re-identified.

CONSENT

When access to essential services is mediated by technologies requiring consent for the use of personal data, users' ability to deny that consent without facing negative repercussions is considerably limited. In practice, this can lead to a situation where users feel obligated to accept terms and conditions that they would otherwise reject, thus compromising the freedom of consent.

The Boti chatbot case is a clear example of this problem, since the legal notice establishes that by continuing to use the chatbot, the user is granting consent. However, for the consent to be truly free, users must have a real option of withholding it without facing negative consequences. In the case of Boti, if using the chatbot is necessary for accessing certain essential services, users can feel they are required to accept the terms, which compromises freedom of consent. To respect the principle, an alternative to using the chatbot should be offered for those who do not wish to grant consent.

In addition, the legal notice mentions that the data will be used to fully implement the features offered. These statements are fairly broad and vague, which can make it difficult for users to understand exactly what their data will be used for. It is necessary to clearly specify in detail the exact purposes for which the data will be collected and used, avoiding generic terms. For example, instead of "fully implementing the features offered," the specific functions involving the use of

personal information should be described. In turn, this benefits compliance with the principle of purpose described above.

Explicit consent requires an affirmative action by the data subject. The current formulation of the legal notice may not meet this criterion since it seems to assume consent automatically by continuing to use the service. It is necessary to implement an explicit mechanism for obtaining consent, such as a verification box that users must check to continue using the chatbot. In addition, this consent must be recorded and stored such that it can be audited as necessary.

Lastly, it is important to consider that digital skills and literacy are not evenly spread among the population. There are segments that still may not have the skills or knowledge needed to fully understand the terms of use and the implications of granting consent. These gaps can further exacerbate the situation, making certain groups more vulnerable to accepting conditions they do not fully understand, so as not to lose access to critical services. Therefore, it is crucial for consent and data use policies to be clear, detailed and accessible to everyone, ensuring true freedom of choice.

SECURITY

Some of the experts interviewed indicated that the Argentinian public sector faces multiple challenges in protecting its databases. One of the most critical is the lack of adequate technological infrastructure, since many government offices operate with obsolete and fragmented systems that not only make efficient information management more difficult, but also leave them vulnerable to security breaches. This defective infrastructure hampers the implementation of robust, up-to-date security measures, exposing sensitive data to potential cyberattacks and unauthorized access. In addition, they mentioned that the absence of personnel trained in cybersecurity aggravates the problem. Although Argentina has highly qualified information security professionals, many of them work in the private sector due to the extremely competitive conditions offered there. This situation significantly reduces the public sector's ability to respond to security incidents and vulnerabilities. Continuous education and training of personnel in cybersecurity issues is essential for maintaining data integrity and confidentiality; however, these initiatives are insufficient and, in many cases, nonexistent.

Finally, some of the specialists interviewed also indicated that, while there are laws and regulations for personal data protection, their implementation and oversight are

inconsistent, making it hard to create a culture of data security and privacy in the public sector. It is critical that clear policies be established, together with constant oversight, to ensure the security of databases throughout the public sector.

The principle of security in personal data protection establishes that organizations must adopt adequate measures to protect personal data against unauthorized access, loss, destruction, damage or improper disclosure. This principle is fundamental to guaranteeing the confidentiality, integrity and availability of personal information. The audit report on Boti provides a detailed perspective on the security practices and measures implemented. Based on that report, several key aspects related to this principle are presented below.

a. Security responsibility and management. The audit revealed that the hardware manager and the protective software for connections, IP addresses, access points, firewall and VPN are not clearly identified. The lack of clarity in assigning responsibilities may significantly compromise the system's security. There is no supporting documentation ensuring signed confidentiality agreements and no disclosure of the source code with Boti's developers. This lack represents a risk of unauthorized access and potential leaks of sensitive data.

b. Contingency plans and recovery. Although the use of ISO 27001-based continuity tests and the performance of periodic recovery tests are mentioned, the documentation supporting these procedures is not included. The lack of tangible evidence could suggest an improper or incomplete implementation of these critical practices. Boti's continuity and availability are not guaranteed should unexpected events with the supplier occur, since there are no clear plans or provisions for the chatbot's transportability, adaptation or eventual migration to other suppliers or to GCBA's own infrastructure.

c. Risk management and monitoring. The GCBA does not report whether there is a method for monitoring risks, logging events, or evaluating impacts and their frequency. The lack of these mechanisms hampers an effective, rapid response to security incidents. Policies, processes and specific developments for compiling and analyzing users' level of satisfaction are not spelled out, which prevents continuous assessment of security and privacy from the users' perspective.

d. Security policies and procedures. Although it is mentioned that logs are handled in a section of the audit, the kind of access, methodology used for management and the record backup time threshold are not specified. These details are essential for ensuring

traceability and responsibility in personal data management. No information is provided on the operating systems, technologies and software of the work devices linked to Boti servers. This lack of transparency complicates evaluation of the security of the technological environment as whole.

BY WAY OF CONCLUSION

The implementation of the Boti chatbot by the Government of the City of Buenos Aires raises important challenges in terms of privacy and personal data protection. While the objective of improving access to information and the inclusion of citizens using technological tools is noteworthy, addressing the shortcomings identified is essential to guaranteeing respect for fundamental rights and data integrity.

For this, as present above, an exhaustive review of Boti chatbot privacy policies is needed to ensure specificity and transparency in the purpose of data collection, as well as in the processes of anonymization and obtaining consent. It is critical for users to have a real option to choose from if they want to provide their personal data, without feeling coerced by the need to access essential services.

In addition, it is imperative to improve information security practices, from the clear delegation of responsibilities to the implementation of appropriate contingency and recovery plans. The lack of adequate technological infrastructure and effective supervision are obstacles that must be addressed to adequately protect citizens' personal data and privacy.

Finally, a comprehensive approach is needed that combines improvements in personal data protection policies and procedures with investment in technology and staff training. Only with a firm commitment to privacy and information security can citizen trust in the use of public technological tools be promoted.

The case of the Boti chatbot, as a government AI-based technological solution that gathers and processes information, reveals an urgent need to assess the potential risks and negative impact on people and societies as an indispensable requirement for its use and development.

The framework for conducting these assessments must be international human rights standards, and they must take place throughout the technology's whole lifecycle, in particular before and during its implementation. All this with the goal of determining

whether an AI system should be installed or not. In other words, if the evaluations detect substantial risks to people's rights or public safety, or they do not satisfactorily meet applicability conditions, the project should be abandoned or interrupted immediately — at least until the people in charge take the necessary measures to address, handle and/or repair the risks or affectations identified and communicate them to citizens.

Human rights risk assessments, especially in privacy and personal data protection, are a vital component in data governance and Artificial Intelligence in the public sector. Another indispensable aspect for this is having an organizational structure that precisely establishes the administrative areas intervening in the development of implementing AI systems, as well as the associated transparency and accountability mechanisms.

To close, it is worth highlighting the asymmetry in the balance of power existing between the computing capacity of AI systems and personal data subjects. In other words, while these technologies may possess and process a large volume of information about an individual, the latter often may not even know the system operator. Therefore, there must be an obligation for identification that enables each individual to know at a minimum the intervening governmental areas who are responsible for the AI system in operation. In addition, personal data subjects must be able to exercise the right to oppose their personal data being processed by Artificial Intelligence systems, especially when access to services depends or is conditioned on handing them over.

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