ToxiBot: Harnessing Technology for Harm Reduction in Argentina's Nightlife Scene

Aníbal Sacco, Pablo Ferreyra, Patricio Liddle, Nicolás Tentoni, Serena Suárez, Ariel Cotrone

Introduction. | Why did we build ToxiBot?

In Argentina's nightlife scene, MDMA use is widespread, and prohibition only intensifies the risks. Users face harm from adulterated substances and from laws that criminalize possession. ARDA's outreach teams faced additional barriers: test results were recorded on paper, increasing legal exposure and making data analysis more difficult. Born from the collaboration between tech experts, drug users, and harm reduction workers, ToxiBot uses simple, secure technology to digitize fieldwork and empower communities with evidence-based information, when and where it matters most.

Goals and Challenges. | What problems does ToxiBot address?

ToxiBot was developed to meet two urgent needs: giving drug users timely, reliable, and anonymous access to testing results, and improving how harm reduction teams register and manage data. In a context of widespread MDMA adulteration and legal risks, users lacked safe access to critical information, while outreach teams relied on inefficient manual systems. ToxiBot responds by offering secure, accessible digital tools to address both gaps.

ARDA ASOCIACIÓN DE REDUCCIÓN DE DAÑOS DE ARGENTINA

Project Development Timeline. | Growing ToxiBot: A Journey of Innovation

ToxiBot began in 2022 as a grassroots WhatsApp bot created by drug users and tech activists, initially offering basic harm reduction advice as well as several tools to provide guidance on safer consumption practices. Afterwards, it evolved into a secure system for logging substance test results, analyzing trends, and publishing real-time data through a public, searchable web platform.

August 22. Concept and Early Protoype

February 23. Field Integration

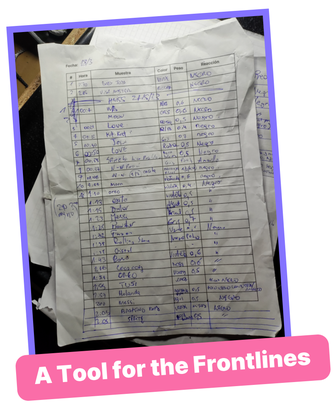
October 23. Database and Infrastructure Overhaul

August 24. Public Launch of the Search Tool

April 25. Scaling and Strategic Impact

From User Experience to Bot Prototype

- First WhatsApp bot created by drug users and harm reduction advocates
- Community-tested menus with basic info on substances and combinations

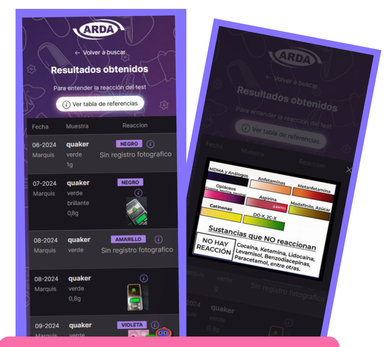


A Tool for the Frontlines

- ARDA begins using the bot to register colorimetric test results at parties
- Manual reporting still used in parallel

From Paper to SQL

- Python backend with Flask connects Twilio to a secure relational database
- Data anonymized via hash encryption
- Image storage integrated



ToxiBot Goes Public

- Website with open-access search tool for test results
- Users can look up pills by name, color, or shape
- Over 2,000 searches within first 48 hours

A National Tool for Harm Reduction

- **1,500+** samples tested and over **24,000** queries logged
- Teams across Argentina begin contributing to a unified national database
- ToxiBot recognized as a model for tech-driven, community harm reduction

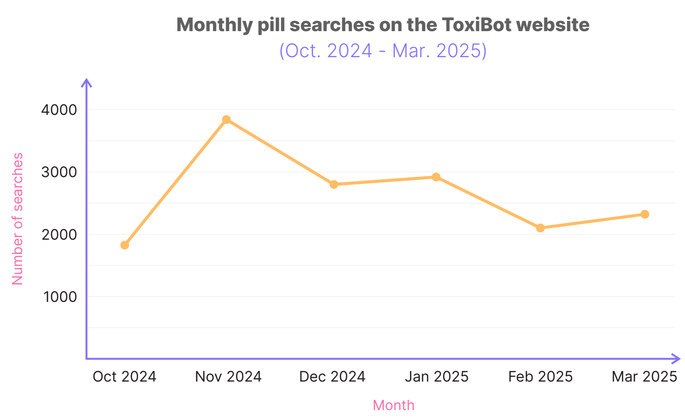
System Architecture

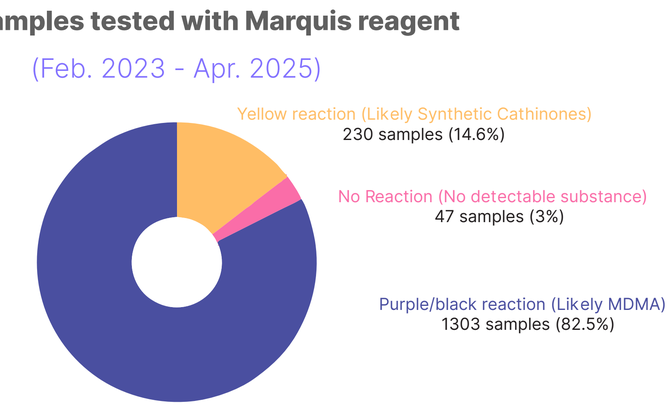
How does it work?

Authorized harm reduction workers submit drug testing data to ToxiBot via WhatsApp using predefined commands. Messages are routed through Twilio to a Flask-based Python server, which validates the sender and data structure. Valid entries are stored in a centralized SQL database, with optional pill images. The workflow is fully automated, secure, and field-ready. User privacy is ensured through encrypted transmission and hashed identifiers. Test results and harm reduction content are published on ToxiBot's website for anonymous public access.

Impact and Reach. | What have we achieved so far?

Since its launch, ToxiBot has expanded access to critical harm reduction resources and streamlined ARDA's fieldwork[1]. It empowers drug users with real-time data, educational content, and interaction tools, while improving the scale and accuracy of testing records. It now supports Argentina's most comprehensive MDMA test database.





Discussion. | What does this mean for harm reduction in Argentina?

ToxiBot demonstrates how community-led technology can fill urgent gaps left by punitive drug policies. In a country where drug checking remains legally ambiguous, it offers a secure, anonymous, and science-based alternative for accessing information. By empowering users to make informed decisions, ToxiBot challenges stigma, supports health rights, and highlights the need for state-backed harm reduction strategies grounded in evidence and human dignity.

Conclusion and Next Steps.

ToxiBot has proven effective as a low-cost, scalable tool for harm reduction in nightlife settings. Its next phase involves expanding across Argentina, integrating with health services, and involving drug user networks in data collection and outreach. To reach its full potential, ToxiBot requires not only technical support but also regulatory frameworks that legitimize drug checking and prioritize public health over punishment.

[1] Inchaurraga, S., & CEADS. (2004). *First steps using rapid assessment and response methods to develop research, intervention and advocacy capacity for addressing drug use in Rosario City, Argentina.* Universidad Nacional de Rosario