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Introduction

Journalism plays a crucial role in democratic societies by holding institutions accountable to the public. The protection of sources' identities is an important part of journalistic practice, allowing "whistleblowers" to share information with journalists without fear of reprisal [1]. To protect sources' identities in a digital environment, journalists use whistleblowing software to anonymize their identities. This is done using a variety of encryption mechanisms. This research focuses on the most popular tools used in the top 10 news organizations that allow users to submit tips.

- **RQ1:** What are the most popular whistleblowing tools used in news organizations?
- **RQ2:** Given each tool, how many actions does a user have to perform in order to send something to a journalist?
- **RQ3:** Which tools are the most usable to the end-user based on how many steps taken, and other usability concerns?

Many tools are available. We chose to test 3 different whistleblowing tools:

- **SecureDrop**, a free, open-source whistleblowing submission system used by news organizations.
- **Mailvelope**, a browser extension that integrates into pre-existing email clients to provide end-to-end encryption.
- **Signal**, an instant messaging client that provides encrypted messaging services, voice, and video calls.

Merits & Impacts

- If whistleblowing tools are unusable, only those knowledgeable about the tools are able to whistleblow. This creates a barrier that may lead to critical information never being reported to the public.
- Our findings can help guide news organizations in selecting whistleblowing software that is usable, allowing for more sources to send information.

Methods

To identify the most widely used whistleblowing tools, we used the Tranco [2] rank of each website to find the most popular news organizations that offer a method to submit tips. Fig. 1 lists those websites, along with each tipping method they offer.

Tranco Rank	Website Name	Tip Submission Methods
94	New York Times	Signal, PGP Email, Email, SecureDrop, Postal
126	CNN	Signal, PGP Email, Email, WhatsApp, SecureDrop, Postal
133	Forbes	PGP Email, Email, SecureDrop, Postal
141	The Guardian	PGP Email, Secure FTP, Phone, Signal, Threema, SecureDrop, Postal
145	BBC/BBC UK	Email, Twitter, WhatsApp, SecureDrop, Form
205	Washington Post	PGP Email, Email, Signal, SecureDrop, Postal
213	Reuters	PGP Email, Email, Signal, SecureDrop, Postal
218	DailyMail	Email, Form
230	Bloomberg	SecureDrop, Postal
234	The Wall Street Journal	Signal, SecureDrop, Postal

Fig 1: A table showing each website, their Tranco rank (out of 1 million websites), and the submission methods they provide.



	Clicks	Subtasks
Installation (as journalist)	8	Installing Tor
Usage (as journalist)	14*	Navigating login, authenticating, downloading file, decrypting file, opening file
Installation (as tipper)	8	Installing Tor
Usage (as tipper)	5	Login

* SecureDrop recommends journalists complete an extensive security verification process using the Tails OS system on an air-tight computer to decrypt/view files [3]. Due to time constraints, we were not able to complete this process during the time frame.

Other Usability Issues

- A SecureDrop portal may be offline or unmonitored for periods of time. Some news websites have status indicators, while others do not. A status indicator can ensure that tippers do not waste time trying to submit when SecureDrop is offline/unmonitored.

To find out how many actions a user has to perform to send information to a journalist, we chose to perform a cognitive walkthrough on the 3 most popular security tools: **SecureDrop**, **Mailvelope**, and **Signal**. A cognitive walkthrough assesses the usability of a tool by walking through each step of its task flow. We also measured the number of subtasks a user may encounter when installing and using each program. Subtasks are the number of steps a user must take in order to use the software, and offer a rough estimation of places where a user may have trouble navigating. Subtasks have multiple clicks.



	Clicks	Subtasks
Installation	17	Installation, adding Chrome API to Mailvelope
Usage	5	Sending email

Other Usability Issues

- Mailvelope is not explicitly clear on how or when to import public keys to their keychain.
- Some news organizations do not have their public keys in the Mailvelope database, relying on the user to import the keys themselves.



	Clicks	Subtasks
Installation	20	Installation, account creation
Usage	3	Sending message

Other Usability Issues

- A minor usability issue in Signal's code confirmation interface was detected, in which a mistyped character could not be deleted, forcing the user to have to redo the entire code confirmation process.

Future Work

- Mailvelope presented the most usability issues out of all the tools tested. A user study is desirable to get a better understanding of how actual users would use these tools.
- Evaluation of SecureDrop's usability with Tails OS is in the works.
- A technical paper is in the works.

[1] P. Di Salvo, Digital Whistleblowing Platforms in Journalism: Encrypting Leaks. Cham: Springer International Publishing, 2020.

[2] We use the Tranco list generated on 07 February 2023, available at <https://tranco-list.eu/list/LYVJ4>

[3] <https://docs.securedrop.org/en/stable/journalist.html>