Can I Delete My Account?: Dark Patterns In Account Deletion on Social Media

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We analyze the account deletion process on the 20 most popular social media platforms in the US. Our analysis includes three access mediums: mobile applications, mobile browsers, and desktop browsers. We categorize the platforms by their account deletion options and describe the nature of the dark patterns faced by users trying to delete accounts. Based on our work, we make recommendations and raise questions about mitigating dark patterns in account deletion.

Additional Key Words and Phrases: dark patterns, social media, account deletion

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1 Introduction

Social media users increasingly have concerns about technology addiction [28], data privacy [14], and harassment [2]. These factors often motivate users to leave social media platforms by deleting their accounts. For instance, a study of US *Facebook* users revealed that 26% of users chose to delete the application from their phones [1]. However, as social media corporations rely on monetizing users' data, [4, 12, 21] they have strong incentives to keep users on their platforms and continue collecting personal data [4]. Platforms also have to prevent users from accidentally deleting the content that they have amassed. As a result, account deletion can be a complicated process, and it is sometimes unclear whether deleting a social media account truly removes user data from the platform. Moreover, it is unknown whether social media platforms' attempts to prevent account deletion constitute 'dark patterns'. By dark pattern, we mean "modifying the user's choice set and manipulating the information flow to the user" [25]. While other research has highlighted the presence of dark patterns in interface designs both on the web (eg. shopping websites [24]) and off (eg. [22]), to the best of our knowledge, none have focused on deletion barriers of social media accounts.

To shed light on this topic, we asked the following research questions: 1) How easy is it for a user to delete a social media account and 2) What are the account termination options, and what do they claim to do with the user's data? To address these questions, we created and deleted accounts on the 20 most popular social media platforms via 3 access mediums (mobile applications, mobile browsers, and desktop browsers) and systematically recorded the tasks using screenshots. Based on our qualitative analysis of the 500+ screenshots, we found that permanent account deletion is often not the only option offered to users, that the terminology around deletion is confusing, and that dark patterns exist in deletion tasks. Next we discuss related work, our methods and main findings, and discussion, followed by conclusions.

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2 Related Work

Dark Patterns and Social Media In 2010, Dr. Harry Brignull coined the term 'dark patterns' referring to "tricks used in websites and apps that make you do things that you didn't mean to" [7]. This prompted researchers to discover and categorize dark patterns across the technology sphere. Researchers have studied dark patterns in privacy [8, 27] and elsewhere, highlighting how dark patterns exploit human cognitive biases in order to obtain data out of users [30]. Many researchers have also provided taxonomies of dark patterns including those from the perspective of user experience designers [17]. Many of the dark pattern data sets are small with exceptions such as Mathur et al.'s study of dark patterns on 11K shopping websites [24]. Other studies have focused on dark patterns on mobile apps, [13], robots [22], and game design [32]. Yet, although many studies of social media more broadly exist [5, 6, 10, 16], few have focused specifically on account deletion and dark patterns. Notably, Habib et al. conducted a user study that researched the difficulty users experienced finding opt-out privacy settings and data deletion choices [18].

User Understandings of Data Deletion Data retention and deletion can be a confusing and misunderstood concept for many users [26]. Researchers have studied the deletion environment to help clarify the happenings. From a user's perspective, Child et al. studied why users may want to delete their content, with regards to blogs [9]. Garg et al. formalized what is required of platforms given that users may have the right to be forgotten [15]. Habib et al.'s user study of 150 websites explores the interaction paths users must take to find data deletion options, email communications opt-outs, and ultimately unimplemented settings [19]. Furthermore, researchers have studied the differing impacts of "automatic archiving vs default deletion" of user content [31] and deletion of social media accounts for deceased individuals [29]. We build on this body of knowledge on dark patterns by studying account deletion on social media.

3 Methods

Data collection We identified the 20 most popular social media platforms using *Tranco* [23]. We limited the sites to the United States to keep our websites English-based, as we aimed to analyze the language on social media websites in our data. We focused on popular social media platforms because larger social media platforms often have an established business model with revenue in part based on user data [4, 12, 21]. We used the definition of social media by Kietzmann et al., 'a platform that is used to create, modify, share, and discuss Internet content', to manually label websites as social media [20]. We did this process manually because tools such as WebShrinker provided unreliable labels on sites the researchers would categorize as social media [3] and since Alexa no longer offers a categorization service.

For each platform, we manually created and deleted accounts on the mobile application (on iOS), desktop browser (Google Chrome), and mobile browser version of the platform (Safari on iOS). We chose to use these platforms as preliminary analysis on others (Android, Firefox, Chrome on Android) resulted in no vast differences. We used new email addresses to perform the actions on each platform, and we deleted the accounts on the same day as the creation. We captured information about the task of account deletion, starting at the landing page after signing in and ending at the users final confirmation of account deletion. We also recorded screenshots of any forced work on external resources, such as confirming an email address and counted the number of screens and clicks required to complete the account deletion (if possible). We count button and link presses as clicks; we do not count each required text-box as a click.

Data Analysis Prior to data collection, we created a list of dark patterns that could apply to account deletion based on prior work [7, 17, 24]. For our analysis, we consider Brignull's definition of **confirm shaming** [7]. We define **forced continuity** as forcing a user to continue existing on a platform and allowing any instance of creating, modifying, sharing, or discussing Internet content [20], even though they want to delete their account. We use the definition of

Delete Immediately	Users can delete their accounts, meaning the accounts cannot be recovered.
Close	Users cannot delete their accounts; they can only close them, where they remain recoverable.
Delete After Closing	Users can delete their accounts, but deletion occurs only after an unavoidable period of account closure, where the account is recoverable.

Table 1. Categories of termination options presented to the users.

	facebook.com	youtube.com	twitter.com	instagram.com	linkedin.com	pinterest.com	vimeo.com	reddit.com	wordpress.com	github.com	tumblr.com	whatsapp.com	flickr.com	soundcloud.com	twitch.tv	spotify.com	etsy.com	slack.com	tiktok.com	quora.com
Mobile App	✓	X	✓	X	✓	✓*	X	X	X	X	X	✓	X	X	X	X	X	X	✓	✓
Desktop Browser	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	X	X	X	✓
Mobile Browser	✓	X	✓	✓	✓	✓	X	✓	✓	✓	✓	X	✓	X	X	X	X	X	X	✓

Table 2. The available options for account deletion for each access medium and platform. *Etsy* and *Slack* do not offer deletion options, only closure. There is a deletion option on *Pinterest*'s mobile application, however it did not work in our study (404 Error).

'Forced action' presented by Gray et al. [17]: specifically, we consider **forced registration** to entail requiring users to register for a separate account in order to complete the desired task. Similarly, we consider **forced external steps** to require users to take steps external to the platform in order to complete the desired task. For **immortal accounts**, we looked for indications that platforms kept some degree of data indefinitely (even after users deleted their accounts).

We also categorized each platform by the termination options presented to their users (Table 1). We define account deletion as the task a user must complete in order to no longer be able to access their created account or data. When users seek to terminate their account, but still have access to it or can recover it, we call this account closure. We distinguish closure from deletion by considering recoverable accounts to be closed and unrecoverable accounts to be deleted. Note that platforms use different terminology for deletion. For example, *LinkedIn* calls these options Hibernate and Close instead of Close and Delete, respectively. Two researchers coded the data set of screen shots with the agreed upon qualitative codes for each dark pattern and independently applied boolean labels to the dataset for each platform and access medium. We calculated inter-rater reliability using Cohen's Kappa [11]. Initially, our rater agreement was represented with $\kappa = 0.79$. After discussing and resolving discrepancies, the raters arrived a full label agreement.

Limitations We only captured deletion processes on certain operating systems and device types. Moreover, since we deleted accounts that we had just created, the dark patterns we noted may not be fully representative of existing patterns for long-standing users accounts that have content amassed over time. Finally, we chose to create accounts using email addresses whenever possible, the only exception being *Whatsapp*. The tasks may be slightly different for users registering with phone numbers. Our findings therefore represent lower bounds of dark patterns.

4 Findings

We first present results relating to the account deletion process and then results around account termination options.

4.1 Account Deletion Is Often Not Straightforward

Ability To Delete Accounts Limited On Some Platforms: Platforms control which access mediums allow account deletion. 11/20 platforms offered more than 1 way to delete an account. By contrast, 8/20 platforms only provide users with 1 option to delete their account; 6 of them forced users to use the desktop browser, and 2 only offered deletion via

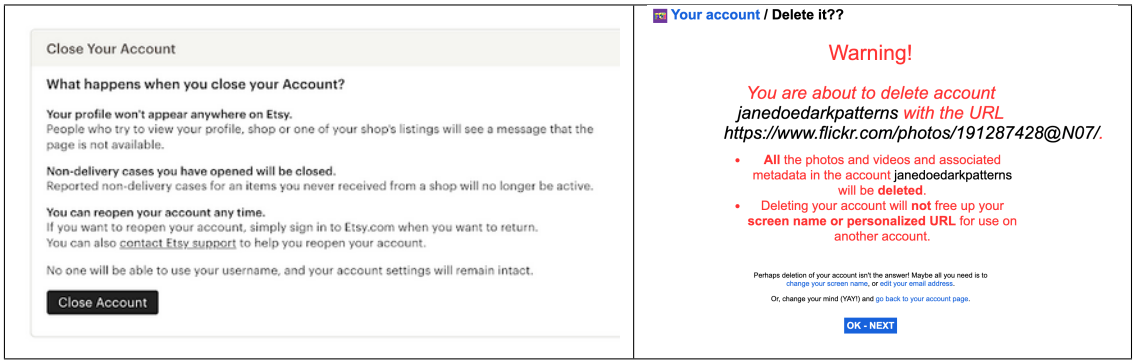

Fig. 1. Immortal accounts by *Etsy* (left) and confirm shaming by *Flickr* (right) for users trying to delete their accounts.

their mobile application. *Whatsapp*, *TikTok*, *Slack*, and *Etsy* were the only accounts that could not be deleted from the desktop browser. *Slack* and *Etsy* do not allow account deletion (by our definition) on any access medium because users can always reactivate their accounts. Interestingly, only 4/20 platforms allowed users to delete an account from any access medium: *Facebook, Twitter, LinkedIn*, and *Quora*. In general, mobile users have less ability to delete accounts than desktop users. It was possible to delete accounts on 16/20 platforms using the desktop version of platforms. However, it was only possible to delete accounts from 7/20 mobile apps. On mobile browsers, it was possible to delete accounts from 11/20 platforms. The remaining 9/20 lightweight mobile browser interfaces did not allow for account deletion.

Forced External Steps and Confirm-shaming Present In Account Deletion 8/16 desktop browser account deletions, 4/11 mobile browser account deletions, and 1/7 mobile application account deletions, exhibited dark patterns. Desktop browsers may have more dark patterns because fewer platforms offer account deletion on mobile apps and browsers. Out of the 34 deletion tasks, we found 7 instances of **forced external steps** and 7 instances of **confirm shaming** and no other dark patterns. For instance, the **forced external steps** for *Pinterest* deletion involve users finalizing deletion via a link emailed to them. In addition, the deletion task on 3/20 platforms (*Instagram, Twitch.tv*, and *Spotify*) required users to navigate to websites or help-centers external to where the main platform use occurs, which cannot be found without a web search on 'account deletion' using a search engine. Confirm shaming was the other most common dark pattern in account deletion (7 instances from 34 tasks). Figure 1 shows a particularly egregious example of **confirm shaming** during account deletion.

4.2 Account Termination Options Are Confusing

The breakdown of account termination options is provided in Table 5 (A). The most common termination option offered by platforms is 'Delete Immediately' (11/20 platforms), followed by 'Close' (9/20 platforms). 'Delete After Closing' is offered by 7/20 platforms. 7/20 platforms offer multiple termination options, but no platform offers both 'Delete Immediately' and 'Delete After Closing'. Of the 10/11 platforms allowing 'Delete Immediately' (no forced period of reactivation capabilities), users are led to believe their deletion occurs once the deletion action is completed. (E.g. shown on *Instagram*: "When you press the button below, your [content] and all other data will be removed permanently and will not be recoverable." Only 1/11, YouTube makes it unclear if deletion does occur immediately, saying that the deletion "can take up to a couple of days"

The 7/20 platforms offering 'Delete after Closing' force user accounts to be closed first for a period of time, after which account deletion automatically follows barring user reactivation or recovery. The 'grace period' varies. For

Facebook, Twitter, and *TikTok*, the forced close-period lasts 30 days; for *Pinterest* and *Quora*, the period lasts 2 weeks; for *Spotify* the period is 1 week, and *Soundcloud* does not indicate this window's duration. 2/20 platforms (*Etsy* and *Slack*) only provide the 'Close' option, offering no way for an account to be made unrecoverable.

Immortal Accounts And Forced Continuity Make Deletion Outcomes Unclear 10/20 platforms had **immortal accounts** and indicated that they kept some account related information even after accounts were terminated. In some cases, platforms use wording like "data will be removed" (*Instagram*), "inaccessible to other *Quora* users", "will no longer be viewable on *Twitter*". The exact nature of what happens to the data is not explained to the users, and it is unclear whether or not the data is not being fully deleted. 7/20 platforms had **forced continuity**, meaning that if a user seeks to terminate their accounts on these platforms, other users on the platforms will still be able to engage with their content for some time. Some of these platforms overlap with the platforms only offering a 'Delete After Closing' option. For instance, when deleting an account on *Quora*, a forced 14-day closure period occurs before deletion, and the user's content is not removed from the platform until the end of this period. 2 of the 7 platforms we labeled with **forced continuity** were special cases. It was unclear when *Youtube* and *Soundcloud* account data was deleted. *Youtube* informed users seeking deletion that "usually this takes a few minutes, but can take up to a couple of days if you have a lot of content." In both cases, other users could still interact with the account after deletion, but it was unclear for how long.

5 Discussion

Unclear Line Between Necessary Friction and Dark Patterns Our findings show that it is not uncommon for users to face friction when trying to delete accounts. Platforms have to prevent users from unintentionally losing their content but when is this friction excessive or unnecessary? For instance, immediate deletion may be important in cases like users escaping online harassment [2] whose profile and content may be visible for up to 30 days after trying to leave the platform. We suggest that platform designers consider allowing users to fully delete all trace of their account if desired.

Account Deletion and Transparency of Data Retention Our findings suggest that some platforms do not guarantee that users' data will be deleted from the platform's servers. Even if an account and its information is no longer accessible to users on the platform, it may still exist in "the cloud". Platforms may have incentives for keeping user data even after account termination (e.g. financially or legally). For example, an email from *Quora* received after submitting account for deletion informs US users that they will be "temporarily preserving and quarantining your data to fulfill our legal document preservation obligations (such as in response to subpoenas, legal process, or other court-ordered obligations)." We suggest that more work be done to research the data-retention incentives of platforms.

6 Conclusion and Future Work

We studied account deletion on 20 popular social media websites in the US. We found that account deletion options are more restricted on mobile, that account deletion terminology is confusing, and that many platforms do not specify what happens to a user's data when an account is deleted. In future work, we plan to conduct a user study to see how users perceive account deletion tasks, associated dark patterns, and the effects of account deletion on data privacy. Based on our study, we suggest that data sets such as the one we produced are valuable tools for the design community to help educate designers about dark patterns in different contexts. Yet, questions exist around how to create these data sets at scale when objects of study do not easily allow for automated scraping as in our case or where to host these design resources for raising awareness about dark patterns.

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A Tables and Figures

Access Medium	Deletion	Deletion with External Steps
Mobile App	8	8
Mobile Browser	5	5
Desktop Browser	5	5.5

Table 3. The median number of clicks to complete the task among the platforms and mediums that allow it.

Access Medium	Deletion
Mobile App	6.5
Mobile Browser	4
Desktop Browser	4.5

Table 4. The median number of screens to complete the tasks among the platforms and mediums that allow it.

Term. Option	facebook.com	youtube.com	twitter.com	instagram.com	linkedin.com	pinterest.com	vimeo.com	reddit.com	wordpress.com	github.com	tumblr.com	whatsapp.com	flickr.com	soundcloud.com	twitch.tv	spotify.com	etsy.com	slack.com	tiktok.com	quora.com
Delete Immediately	X	✓	X	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	X	✓	X	X	X	X	X
Close	✓	✓	X	✓	✓	✓	X	X	X	X	X	X	X	X	✓	X	✓	✓	X	✓
Delete After Closing	✓	X	✓	X	X	✓	X	X	X	X	X	X	X	✓	X	✓	X	X	✓	✓

Table 5. Each platform's termination options presented to the users (on whichever access mediums allows them).