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Applications for In-situ Feedback on Social Network Notifications

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Abstract. In social networks, it often arises that a post is shared with a broader audience than intended, which is often finally noticed when one of the unintentionally included friends likes or comments on the post. We present an approach for privacy setting adaptation based on in-situ feedback on such social network update notifications. We implemented a smartphone application that allows users to give positive or negative feedback using two buttons integrated into Facebook's update notifications. We collected qualitative feedback from focus groups to find out what impact of in-situ feedback on privacy settings is expected by users. Our findings indicate that there is no general rule of thumb on how the privacy settings should be adapted. Nevertheless, the discussion led to a new approach that allows users to manage and adapt her privacy settings, and which is also capable of performing content elicitation and filtering for social network sites.

Keywords: feedback, smartphone, smartwatch, social network, privacy, user interface design

1 Introduction

Social network users usually underestimate the audience of their social network posts, which results in their posts being seen and commented on by friends and acquaintances that were not intended to do so, leading to privacy leaks which are often only discovered when comments or likes are posted by friends outside of the intended audience [1]. In fact, the perceived audience comprises on average only 27% [1] of its true size. There are solutions using machine learning to assist the user in doing his privacy settings [4, 5], but those systems rely on inferred privacy setting suggestions rather than active user feedback. Another problem is the algorithmic curation to organize, select and present posts on a social network newswall that might be of interest for the user. Most of the users (62.5%) are not aware of the presence of such algorithms, and often feel anger when finding out about their existence [2]. A comparative study has shown that a user interface where users can see and influence the outcome of the curation algorithm led to a significantly more active engagement with Facebook and bolstered overall feelings of control on the site [2].

We implemented a mockup smartphone application that adds feedback functionality to the update notification, so that the user can easily give feedback on

his updates while he is on the go. Due to the limited space in a notification bar and to allow a fast feedback action, we used a binary feedback approach as a starting point for the discussion, where the user can either describe his feelings on the new comment or like as "positive" if he perceived it as a positive experience, e.g. if he liked that the post was seen and commented on, or as "negative" if the user would have preferred that the user had not seen and commented on the post. In a small-scale qualitative study with four focus groups, we found out that there is no direct implication of feedback on the privacy settings. Nevertheless, the input can be used to define privacy settings within an interactive privacy dashboard, as shown in the discussion.

2 Related work

For systems that are embedded into the daily life of users, such as social networks or mobile phone apps, research has found in-situ feedback to be one of the most powerful approaches, due to its directness of feedback and the preservation of the feedback context [3]. A feedback method similar to ours has already been used for crowd contributions in short bursts of time, by taking advantage of the common habit of turning to the mobile phone in spare moments: Whenever the mobile phone is turned on, the user is asked to solve micro-tasks of one or two seconds, thereby lowering the threshold to participate in crowdsourcing activities [7]. In a study with 82 users, the participants made 11240 crowdsourcing contributions in total. The comparison between a conventional smartphone and one using the crowdsourcing application showed no statistical difference in either unlock speed or the users' cognitive load, leading to a high acceptance rate of the approach [7]. In-situ feedback for social network update notifications (like notifications or "likes" about new comments on the user's posts) has, to the best of our knowledge, not been part of a research study yet.

3 User study

Although the app is not fully functional as the Facebook API does not allow the retrieval of a user's notification updates, we showed the participants the app for clarification on how such an app could look in later stages of the interview. The header of the notification shows the name of the person who liked/commented on the user's post, as well as the abbreviated text of the post. Below the header, two buttons labeled *"positive"* and *"negative"* can be found for giving positive feedback ("I liked that the person commented on the post/I liked that he saw the post") or negative feedback ("I did not like that the person commented on the post/I did not want him to see the post"). If the user does not want to give feedback on the update notification, or if he has neither a positive nor a negative feeling about the update, he can swipe away the notification as usual in Android.

In order to find out the desired effects of the provided feedback, we conducted focus groups at our institution. To be more precise, we conducted four focus groups, two with two participants, and two with three participants. All

participants were required to be active social network users, and were recruited through postings at our university. Each participant was paid 8 EUR as compen-sation for their participation in the focus group. All participants were students of different disciplines, aged between 19 and 31 (mean 25.6). During the exper-iment, the participants should first state whether they already experienced an unwanted disclosement, and how they could imagine social network providers could help them in avoiding such scenarios. Afterwards, the particpants were shown the mock-up application, and asked to discuss possible implications of the feedback on their privacy settings as well as alternative ways of using the feedback.

4 Discussion and Outlook

Even within our small test set, there is no general opinion on which immediate effects the feedback should have, neither on the privacy settings for the commentator, nor for her close friends or friend groups. Some of the users just want to discuss with the commentator, some would put the commentator on a restricted list directly or after a certain amount of negative feedback, and others would block her instantly. The same holds for the closest friends of the commentator: Although most of the participants stated they should not be affected by negative feedback, four out of ten subjects also wanted the closest friends to be affected by the feedback and put onto some restricted list, either automatically based on tie strength, or after approval by the user. We therefore see little value for adapt-ing the privacy settings, neither based on a rule-set derived within a large-scale user study, nor by using machine learning and a large data set. Although there is no rule of thumb for how a single feedback should directly affect the user's privacy settings, the participants of the study mentioned a different approach that could be used to adapt the privacy settings: Positive and negative feedback for the user's friends is collected to form a list of "positivity rankings" that can be used for defining the right audience for future social network posts. For this purpose, the ranking list is separated into three parts: The topmost part ("green list") receives the user's status updates directly on their wall. The next set of friends ("yellow list") can see the updates, but only when they visit the user's personal page. The last group of friends ("red list") does not receive any posts of the user. The user should have an interface to define the boundaries between the red, yellow and green lists and should be notified when a person is about to move to another list based on the user's feedback. Another application of the positivity ranking is content elicitation on social network sites: Facebook, for example, displays or hides content based on calculated tie strength. It is also possible for the user to give explicit feedback on some posts, so that "fewer posts like this" are displayed in the future. Nevertheless, studies have shown that the tie strength and friend lists do not completely fit the tie strength order that a user would expect [6]. Using the positivity ranking could therefore lead to better content elicitation than the current standard. Whether this is the case should be investigated in a future study. As space is very limited on smartphone devices,

we concentrated on a minimalistic design for the update notification messages on our smartphone application, offering only a binary feedback choice (positive and negative). However, one focus group discussed a more fine-grained feedback option is needed, involving three, four or more buttons. Users often receive feed-back that is on one hand negative, but that is useful for further improvement or that leads to a different, new point of view. Such *helpful feedback* might have a different impact on the positivity rating than destructive negative feedback. The same applies also for positive feedback that can be helpful, or not. We would like to investigate the optimal number of feedback options and the desired effects on the positivity score in future work. In the next step, we would like to publish the friendship dashboard as a Facebook application, to observe the acceptance level and effects in everyday social network usage. If the dashboard is accepted, we will extend the functionalities to allow content and notification elicitation based on the positivity scores, again in a two-step approach with a prototype in a lab study first, and an in-the-wild study later on.

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