
Empowering Users to Make Informed Permission Request Choices

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Abstract

The average smartphone user handles multiple app notifications a day. Apart from the potential valuable information these notifications carry, they can often be disrupting and annoying. To an extreme end, this can lead to information overload and result in technostress. On Apple's iOS, apps need to request permission to send notifications. However, this request is rather nondescript, i.e. it doesn't tell the user about the nature or frequency of notifications. In this paper we present a concept for empowering users to make informed choices on whether to accept or deny push notification requests.

Author Keywords

smartphones, notifications, apps, permission requests, Human Factors

ACM Classification Keywords

H.5.m [Information interfaces and presentation (e.g., HCI)]: Miscellaneous.

Introduction

Push Notifications on smartphones proactively inform users about a variety of events, utilizing visual pop-ups, app icon badges or audio-tactile cues. These notifications are a core feature for many apps. With the ever rising number of apps available from mobile application stores,

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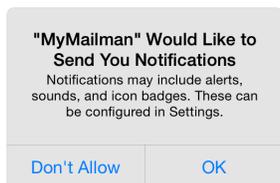


Figure 1: Default request

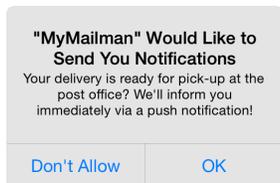


Figure 2: Custom request with an explanation

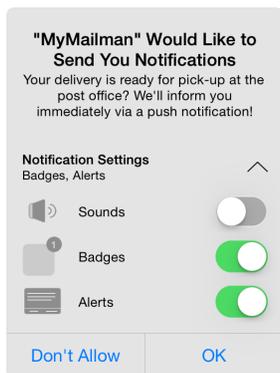


Figure 3: Custom request with explanation and notification settings

the number of apps making use of this channel increases.

Considering the two major smartphone operating systems, Android and iOS, Android users automatically 'opt-in' to receiving push notifications when downloading an app, while users with a device running iOS may choose to receive push notifications by 'opting-in' when prompted. However, this prompt doesn't allow for making an informed choice, as the permission request looks the same (except for the app's name) for every app (see Fig. 1) and doesn't give a hint on what kind of notifications the user has to expect when opting in.

For permission requests covering privacy related data (e.g. address book or location) it has been shown that added explanations made users accepting these kind of permission requests more often than those without [2]. The option of adding purpose strings to permission requests is not available to push notifications as of iOS8.

In a recent study [3] we investigated whether added purpose strings had an effect on acceptance of requests (cf. Fig. 2). Half of the participants overlooked the difference between default and custom requests (Fig. 1 ↔ Fig. 2), stating that they do not pay attention to these requests, as they always look the same. We ran a Mann-Whitney's U test to evaluate the difference in the responses. We found that participants who identified custom requests were statistically significantly more likely to accept requests ($U = -4.21, p < .001$).

A Wilcoxon test was conducted to evaluate whether users who identified different request types were more likely to accept a request that contained an explanation compared to a default one. The results indicated a significant difference, $Z = -2.44, p = .007$. Customized requests were accepted more often compared to the default requests.

For participants who did not identify custom requests no difference was found.

Mashhadi and colleagues [1] report that users would like to have more fine-grained controls over notification settings, including different modalities for different notifications with varying priority. We found that participants in our study rarely made use of the existing ones.

Design Concept for Permission Requests

Adding explanations to push notification permission requests was our initial attempt, as seen in Figure 2. While this request type was significantly more likely to be accepted compared to the default one (cf. Fig 1), it still looks very similar to the default request, so that many participants overlooked the difference.

Participants in our study rarely changed notification settings, although they apparently would like to have these controls at hand [1]. An explanation would be that a) they did not know about these settings, or b) they do not want to bother to navigate to the system Settings app in order to change notification settings. Presenting these settings simultaneously with the permission request (see Figure 3) would be a solution for both possibilities. These added options also present a visual cue that may not be easily overlooked and mistaken for a default request.

Discussion & Future Work

So far, the effect of added explanations in permission requests on acceptance has been shown in a laboratory study. We would like to take this to the field and test it in an app available from the App Store. As initially stated, it is not possible to modify the default request. Thus, a workaround would be to show the customized one before

the actual system request. This would also come with the benefit that, if the user denies the first request, it would still be possible to ask her again at a later point in time. This is currently not possible with the default system request which is a one-time-only request.

Further, it would be interesting implement this approach in a variety of apps from different categories, as notification settings, if used, likely differ between categories. The library for presenting the custom requests is made available as open source software on GitHub:
<https://github.com/QULab/APNPermissionRequest>.

References

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