

Ad As You Go: A Study of Ad Placement on Personal Navigation Devices

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Abstract. The paper describes the results of a user study that investigated the context-sensitive placement of online ads on a Personal Navigation Device (PND). We found that ads are disliked if they interrupt engaged user activities, if they are presented with PND functionality with which the user feels uncomfortable, or if they are large in size, irrespective of the provided content and incentive.

Keywords: mobile ads, personal navigation device (PND), user study, layout

1 Introduction and Prior Studies

Mobile advertising (M-advertising) is an emergent trend in the marketing world. “M-advertising enables not only the sending of unique, personalized, and customized adverts, but also the ability to engage consumers in interactions with the sender of the message.”[3] Cell phones, PDAs, and other mobile devices have been tapped to exercise this newfound resource. In traditional advertisement, such as newspaper, television, or flyer ads, the advertisers only need to provide marketing information such as promotions, coupons, or product information. In contrast, M-advertising ads are additionally expected to be more “useful” than traditional ads, to compensate for their intrusiveness. “Usefulness should not only be understood as providing discount messages or alerts, but it also refers to providing up-to-date information via this direct instant response channel, which in turn keeps the mobile audience constantly aware of the various promotions a firm has.”[1] “Location Based Advertising” interprets usefulness as “relevant at the current location”.

Personal navigation devices (PNDs) are increasingly becoming an everyday part of life and a vital part of driving. As these devices grow more sophisticated, it becomes possible to display advertisements and product/service offers along with navigational information. In this paper, we will explore several possible layouts for presenting advertisement on a PND, and gauge the relative acceptance level for each layout. The layouts are presented to users through an interview with simulated walkthroughs comparing displays with and without advertisements, and through an online survey. Results from the study will be analyzed and discussed.

Based on the results of prior research, the PND advertisements in our study had two important characteristics:

1. They were permission-based, meaning that we informed the subjects that end users would explicitly consent to viewing ads before receiving any. It has been shown that obtaining the users' prior permission greatly improved their attitudes towards mobile advertisements [2].
2. They were often coupled with discount coupons, which have also been shown to be a major factor towards user acceptance [4].

This study differs from prior research on consumer acceptance of mobile phone advertising (e.g., [1]-[7]) in three major respects:

- Earlier work focused on the content of mobile ads, while this study for the first time focuses on issues of presentation and layout.
- This seems to be the first study on PND advertisement. PNDs differ from the mobile environments previously studied due to the fact that the functionality of the device gives more options for the placement and type of advertisement.
- PNDs are also typically used while driving, which raises safety concerns in that users should not be distracted by, or forced to interact with, an ad while they are driving.

These factors make consumer acceptance of PND advertisement a unique problem. Since PND operation requires high level of engagement, it is suspected that PND advertising can be viewed as more intrusive than ads on other mobile devices. The irritation level with PND ads must therefore be lower than that for average m-advertisements. "Marketers should avoid any mobile advertising that consumers might find irrelevant or irritating." [1]

2 Methodology

Different presentation forms for online ads were suggested by the industry partner and by the participants of an initial focus group. The most promising proposals were then evaluated with two principal methods: face-to-face interviews with six participants and an online survey with twenty participants.

Before the interview, the interviewer provided a legal consent form, a study information sheet, a demographic survey, and a PND experience survey for subjects to complete. Participants would then be asked to walk through two simulations; one without advertisements and one with. Both were discussed immediately after the respective walkthroughs. The interviewer then showed a series of screenshots of various advertisement methods and asked the user to score their intrusiveness on a Likert scale of one to five:

- two alternative ads in the navigation situation, namely *Navigation Ad* (see Figure 1) and *Alt Navigation Ad* that showed a larger logo ad instead;
- a *POI Ad* that will be displayed when the user is searching for Points Of Interests (such as hotels or restaurants);
- a *Destination Ad* that would be displayed when arriving at the destination; and
- a transparent *Stoplight Ad* (see Figure 2) that would be displayed when the car was not in motion.



Figure 1: Advertisement during Navigation



Figure 2: Advertisement during Stoplight

The same screenshots and Likert scales were then administered in an online survey, to reach a wider audience (a snowball approach was used to recruit study participants). The subjects for both studies were between 20 to 30 years old, drove cars on a daily basis, and expressed no extreme preference towards shopping.

3 Results

We will now discuss several results of our interviews and online questionnaire. We thereby divide the PND functionality into two groups: core features such as providing directions while driving, and auxiliary features such as entering and searching for POIs prior to driving.

Effect of core vs. auxiliary feature: As far as the core functionality is concerned, half of the users did not want to see advertisements while driving when the navigation

support was on, either not at all or not if displayed too often. However, the other half of the users was not reluctant at all viewing advertisements while driving. In fact, they showed optimism and excitement while they discussed our layouts and gave feedback thereon. In contrast, users showed mostly positive attitudes towards the presentation of advertisement while using auxiliary PND features. Most users mentioned that the notification about POI would be the best place to display advertisements.

This result could mean that users are less susceptible towards interruptions when their cognitive load is high (for example, when the user is simultaneously driving and following PND directions, as opposed to searching for a POI while the car is parked.)

Effect of experience with PND features. During our interviews, we discovered that users showed different attitudes toward advertisements depending on their level of comfort with the PND features with which the advertisement was shown. Users who felt comfortable using a feature tended to report a positive attitude to displaying ads with this feature, while users who felt uncomfortable reported a negative attitude.

Desire of control over ads: Most participants, regardless of their attitude towards advertisements, requested the option of turning advertisements on and off. This is a somewhat unexpected finding since some experiments about advertisements on mobile phones had indicated that consumers' perceived control over advertisements was *not* a strong contributor to make them accept advertisement. [1]

Degree of interruption and size of ad: The results from the online survey (see Figure 3) reinforced the impression we received from our interviews. Users rated the advertisements that interrupted normal use such as the stoplight and destination advertisements as the most intrusive, but were more favorable towards advertisements that were less intrusive on normal activities such as the navigation screen and POI search advertisements. The advertisements that took up more screen space were also likely to be rated as more intrusive. In Figure 3, Navigation Ad and POI Ad were small while the others were large and covered most of the screen.

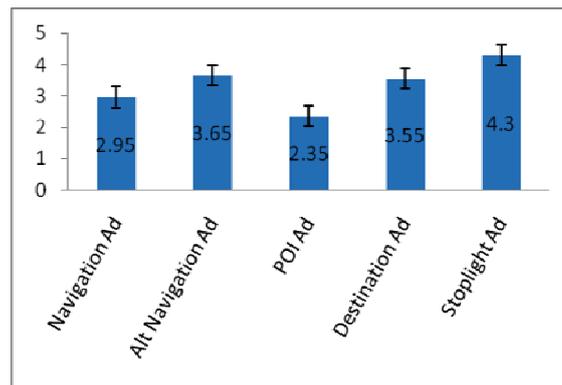


Figure 3: Overall Intrusiveness Rating of Ads in Online Survey (5 is highest)

4 Discussion

Our results unveil user constraints on the layout and timing of ads on PNDs, which will have to be taken into account by any type of ads placed on PNDs, including position-aware and personalized ads (e.g., interest or history based). In addition to the results reported in Section 3, our study found indications that some types of incentives would increase users' acceptance of advertisements. For instance, one user stated that he did not like seeing any ads on his PND; however, if free traffic information is offered with the ads, he would consider it.

Based on our results, we offer the following design guidelines for ads on PNDs:

1. Do not interrupt engaged users, or if this is unavoidable, make at least the interrupting window small.
2. Do not display ads for PND features with which users feel uncomfortable.
3. Allow users to have control over the display of advertisements.

All three guidelines call for some form of user profile that contains information on the preferences and abilities of each individual user.

5 Conclusion and Future Work

In this research, we found that users disliked ads that are disruptive to engaged activity, particularly those that take up large real estate on the screen. However, when the activity requires a low cognitive load, users often show appreciation for ad placement, especially those that are relevant to their activity. Possible future work includes (a) incorporating personal preferences in displaying various advertisements types, placements, and sizes, (b) incorporating smart suggestions so that users will see ads that are more relevant to what they have looked for in POI searches, and (c) conducting user tests in real driving situations.

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