Just One More Thing! Investigating Mobile Follow-up Questions for Opinion Polls on Public Displays

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ABSTRACT

In this ongoing work we explore the advanced interplay of smartphones and opinion polls on public displays which enables in-depth follow-up questions beyond the original poll issue on the personal device. To investigate the acceptance of such follow-up questions, we conducted a preliminary field study with a functional prototype. The results indicate that closed follow-up questions with multiple choice answers on the mobile device are well-accepted by participants.

Author Keywords

e-participation; mobile interaction; public poll

ACM Classification Keywords

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

INTRODUCTION

An increasing interest has been emerging in utilizing pervasive computing technology such as ambient urban appliances for e-participation purposes. Especially public displays can help to raise awareness for topical issues among passers-by on-the-spot and enable quick in-situ participation (e.g., *Agora2.0* [3] or *Viewpoint* [4]).

In this paper, we investigate mobile follow-up questions for a public opinion survey on a large screen. Contextual in-depth questions can be initiated on the user's device to infer background information, yet do not detain a participant, while the large display can still show the main poll question to further attract passers-by. We conducted a preliminary field study to investigate the acceptance of such follow-up questions.

EXPERIMENT

To collect first real-world experiences concerning the acceptance of mobile follow-up questions, we designed and conducted a field study with a functional prototype.
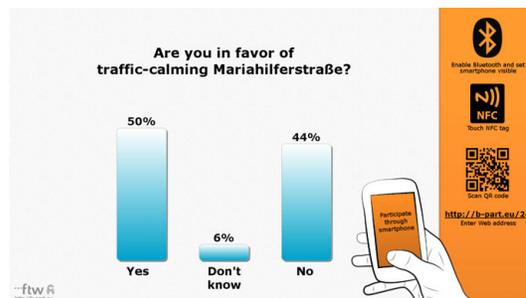
Figure 1: The public screen design contained a timely, locally relevant poll question with the interim result.

Figure 2: After answering the poll question (a), the mobile interface presented a couple of follow-up questions (b).

Study Prototype

Our screen (Fig. 1) showed a question and a chart visualizing the interim result for the answer options (yes/undecided/no). Votes could be casted through smartphones on a web page with corresponding buttons. To not exclude interested passers-by due to technical reasons, our prototype featured four mobile techniques to access the voting page.

When participants had shared their opinions through the mobile voting page (Fig. 2a), follow-up questions with answer buttons were subsequently posed on the mobile devices. We deliberately did not apply follow-up questions directly related to the original poll questions but used a meta questionnaire for this first study, in order to present the same questions to each participant and avoid any impacts due to personal preferences and interests. The first follow-up question asked whether the user is willing to answer such mobile follow-up questions in general (yes/no). If the user agreed, the subsequent questions asked about the acceptable amount of follow-up questions (1-2, 3-6, 6+), whether the user would accept to answer open questions by typing in text (Fig. 2b) (if yes, she was asked

to shortly describe her first thoughts on such public polls), whether the topic or the current result motivated the user to participate (topic, both, result), whether she had privacy concerns (yes/no) and whether she was in company when participating (yes/no). We stored the choice and time of each voting/reply. In intervals of 15 minutes a new question (out of six timely and locally relevant topics) was displayed.

Methodology
The prototype was deployed in the entrance room of a university institute for two weeks (10 workdays). Typically, about 70 (mostly technology-affine) students and employees pass this area per workday. To get further insights in the user activity in front of the display, we attached two Android devices (in custom 3d printed cases) running *Trackaware*. This custom-developed lightweight face tracking software builds on the platform's face tracking functions to continuously detect single and multiple faces in the camera video stream.

RESULTS
We counted 18 votings during the 10 days of deployment, which corresponds to a participation rate of about 3%.

Questionnaire
15 participants were willing to answer follow-up questions on the mobile device, 3 answered the corresponding question with 'no'. Concerning the acceptable amount of follow-up questions, 5 participants selected '1-2', 4 participants '3-6' and another 4 participants '6+'. 12 participants replied that they would not accept open follow-up questions requiring them to type in their answer, only one participant stated to accept such questions. However, no text message was actually submitted through the subsequent form. The question whether the poll question or the current interim result was more motivating to participate was answered by 4 participants with 'question', by 2 participants with 'result'. 5 participants selected 'both'. 6 participants stated that they have privacy concerns when using the poll application, 5 answered to have no qualms regarding privacy. Finally, 4 participants answered to be in company when taking part in the poll while another 4 participants stated to be alone during the voting process.

Visual tracking
The system detected a total of 479 people (multiple counts are possible, as Trackaware detects but does not recognize particular faces) looking or glancing at the display (durations mean=6.0 sec, std=15.6 sec, range=[0.0 ; 111.2 sec]). Of those 479 people, 177 were classified as quickly passing by (peripheral awareness of less than 1 sec), 196 had a short look at the display (defined as glancing at the display up to 4 sec), 33 persons studied the display closer (up to 8 sec) and 78 people spent a considerable amount of time looking at the screen (>8 sec). 91.5% of all logged data were single user visual interactions, leaving 8.5% to multi-user engagements. However, in both single user and multiple user situations, 9 votes were contributed.

DISCUSSION
Overall, follow-up questions were well-accepted by the users who already took the first step to interact with the display.

This can be partially explained by Cialdini's principle of commitment and consistency [1] and more specifically with the "foot in the door technique" [2] which states that people are more likely to agree with a request after already having agreed to a smaller request before. However, while 15 out of 18 participants stated to be willing to answer follow-up questions in general, several of them quit the questionnaire early: 13 participants answered the second question, only about half of the original supporters (eight) the last one. The subjects tend to lose interest when a longer series of questions is presented. Open questions forcing participants to enter text turned out to be not suitable for such in-situ interactions.

Trackaware and the log data provide evidence that answering polls in public is a "social endeavor". While only 8.5% of the visual log activity were attributed to multi-user situations, with 9 out of 18 votes, half of all votes were contributed by people interacting with the screen in groups. This confirms the results of prior respective research (cf. [3]) also for public polls utilizing personal devices: the average participation rate of groups is higher than the one of solitary passers-by.

CONCLUSIONS AND OUTLOOK
We presented a field trial investigating the advanced interplay of smartphones and public displays in the context of opinion polls. Our study shows that mobile follow-up questions with multiple choice answers are a suitable and widely accepted extension for smartphone-enabled public displays. While this first prototype included a smartphone-operated opinion poll, future research should explore, how mobile follow-up questions can be realized and designed for public screens supporting touch or gestural interaction - while still preserving the participant's privacy and providing a seamless transition from the public screen to the mobile device. Further, future prototypes should encourage simultaneous connections by multiple devices and provide interactive features for groups.

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