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Deriving Personas Based on Attitudes to Interruption and Information Overload

David Goddard, Paul Mulholland, Lara Piccolo
Knowledge Media Institute | Open University
{david.goddard, paul.mulholland, lara.piccolo}@open.ac.uk

Abstract. Ubiquitous devices provide users with notifications that continue to blur the distinction between work and personal activities. This research aims to understand how users manage - and would like to manage - such notifications in order to design better support. A methodology was developed to create design scenarios from a survey of people's attitudes and perceptions. The survey asked participants how they interact with various collaborative, social and communication services, and about their views regarding trust in those services, privacy and how they have experienced information overload. A two-step clustering technique was then used to identify distinct archetypes within the respondents resulting in 5 personas. A technique uniting personas and empathy map has been applied to model typical behaviours, goals and pain points, which will inform the design of a solution to manage interruptions and information overload.

Introduction

Most users of social and collaborative software have experienced some form of Information Overload (IO) (Schmitt et al., 2018). Studies on social media platforms – where volumes are likely to be particularly high – have shown such IO to have a measurable effect on performance, as noted by Rodriguez et al. (2014).

This research aims to develop an approach to ameliorate IO due to large volumes of content and interruptions across multiple sources. Of particular interest is the intersection between users personal and work life; for many people, the boundary between work and personal applications has become increasingly blurred, particularly where the same devices are used for both.

A key problem for an individual using a system with high information volume is identifying and accessing items that are relevant to them in a format that is useful. Many systems - such as Facebook and Twitter - have their own algorithmic approaches to attempt to alleviate these problems. We hypothesised that these were flawed in many cases[1,2] because of: a) inconsistency of approaches between applications; b) the values and priorities of the user may not match those of the provider; c) privacy concerns over sharing data with the provider; and d) inconsistency of notification technologies between providers.

A survey was used to test the validity of the hypothesis and provides a basis for solution design and evaluation. Personas (Cooper, 1998) can be used to reveal requirements for a solution from the perspective of substantially distinct users. In the next sections, the survey will be briefly described, followed by the method to create the personas. The results are then discussed before concluding the paper.

Survey

The survey asked questions about the reasons for interacting online, optional demographic information, and about how people prefer to receive information under a variety of circumstances. The main body of the survey solicited respondents' opinions on a number of topics as a Likert scale, with some optional open questions, grouped around five themes:

A: Attitudes to interruptions originating from application notifications
B: How well online services understand users' preferences and interests
C: Degree of trust and confidence in online services
D: General views on online services, connected applications and smartphones
E: Differentiation between work and personal use of apps and services

The questionnaire was published using Jisc Online Surveys, and advertised with an intention to reach people who may experience IO - such as IT professionals and academics. Channels used included Twitter, Facebook, LinkedIn, a university noticeboard, internal channels in a large technology company, and directly to personal contacts. To encourage response, optional entry into a prize draw of two gift vouchers was offered. Anonymous responses were permitted, although contact details were required for the prize draw. The survey was open for a total of 40 days ending August 31 2018, with a total of 135 responses received.

Survey Analysis - Clustering

A two-step clustering process was chosen, with clusters first generated for each thematic group of questions (A to E), which were then used as a basis for an overall

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[1]   https://www.engadget.com/2018/12/18/twitter-chronological-timeline-feature-latest-tweets/
[2]   https://www.reviewgeek.com/1328/facebooks-news-feed-algorithm-is-completely-busted/

cluster of clusters. This approach was selected because the first analysis suggested that clusters of users tended to respond similarly across all questions within a theme. The second level clustering was used to identify commonalities across clusters.

The first level of clustering was applied to the questions of each theme, with Cluster A relating to questions in section A (attitudes to interruptions and IO) and so on. Clusters were produced using a k-means algorithm using a k value of 3. Alternative k values were tested, but lower values did not generate sufficient differentiation, while higher values did not result in meaningful clusters.

The second level of clustering was applied using a k-means algorithm on clusters A-E, with a k value of 5. Again, different values of k were tested, with 5 being found to be optimal. The resultant clusters are referred to as clusters 1-5, to differentiate them from the first-step clusters A-E.

Personas

A data-led approach described by McGinn and Kotamraju (2008) was used to generate personas, albeit with a smaller sample survey size and different clustering technique for data analysis and modelling. Cluster analysis for personas has already been considered by Tu et al. (2010), who compared quantitative generation using clustering with the more traditional qualitative method of observing, interviewing and abstracting. They found that the combination of the two produced more representative and less ambiguous personas than qualitative methods alone.

Persona construction used a hybrid of quantitative and qualitative inputs: the clustering output evidenced the personas, but also supplied some more descriptive criteria; demographic and personality traits compatible with the clusters were selected to represent a blend of characteristics embodying typical users. The PATHY technique for persona development (Ferreira et al., 2018) was selected for this work, which is itself based on empathy maps (Gray et al., 2010).

Each cluster was assessed for how members had responded to each of the individual questions of the survey (for example, how did Cluster N members respond to the question: *I receive so much information online that I often miss things that are important or time critical*?). Chi-squared tests determined whether responses to the questions differed significantly across clusters.

Applicable significant responses to questions were assigned to individual clusters in order to frame archetypes. For example, members of cluster 1 said that they separated work and personal usage, could switch off from work, were less happy to receive work notifications in personal time, and were not comfortable sharing personal information. These attributes, combined with any significant demographic information, fed the PATHY technique to derive individual personas. As well as the data-driven development, some descriptive input was also used to help generate realistic personas and achieve a reasonable balance of different types and demographics. Short persona summaries are included here for illustration[3]:

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[3]   The full set is described at https://doi.org/10.21954/ou.rd.7700579

Persona 1 (Susan) - Less adept IT user; mainly social user, experiencing some IO; wants to keep track of friends and family whilst frequently offline.

Persona 2 (Adam) - IT professional; evangelical about technology for social and for work use; experiences IO but very positive about having AI help out.

Persona 3 (Phoebe) - Very computer literate young professional; prolific app user, mainly on mobile; needs help separating work and personal usage.

Persona 4 (Kenton) - Experienced IT user for work and social; doesn't suffer IO, but keen to use technology to ensure important things are never missed.

Persona 5 (Usha) - Computer literate and pragmatic user of IT; does not have IO volume issues, but does experience problems with interruptions from apps.

Conclusion

The survey confirmed the assumption that many IT users experience IO, having diverse relationships with online services and varying levels of trust in the integrity and competence of those services. While some embraced AI as an aide to cope with the variety and volume of information that they have to deal with, others were more reluctant. The clustering technique evidenced distinct sets of attributes for five user archetypes. Statements expressed in the survey were taken from those survey responses having a significant relationship to cluster, and used to build empathy with these notional users. PATHY was applied to flesh out what the potential users of a solution need according to their current perceptions and problems.

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