How Peer Photos Influence Member Participation in Online Communities

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ABSTRACT

Online communities (OLCs) are gatherings of like-minded people, brought together in cyberspace by shared interests. Creating such communities is not a big challenge; sustaining members' participation is. In this paper, we describe a technique for presenting members' photos and evaluate how it affects member participation in the community. We compare three different policies for presenting peer photos on the home page of the web site. Our results show that explicit requests in the form of simple and short messages on the home page of a community can induce participation. We show that we were able to motivate members to (a) log into the system to see photos of fellow members, and (b) upload their personal photos.

Keywords
personalization, informational retrieval, profile matching, online communities

ACM Classification Keywords
H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION
Online communities have the potential to serve their members by providing valuable information, social ties, and forums for discussion and debate. Too often, however, these communities fail, as indicated by a lack of contributions and eventually a lack of visits [1]. We witnessed this potential failure on CHIplace.org, an OLC - originally created to serve the ACM CHI 2002 conference [4] and since adapted to serve as a general discussion site and public bulletin board for the HCI community. To boost its otherwise declining traffic after the conference, and to sustain it thereafter, we decided to redesign the web site. Our research interests focused on exploring ways of keeping visitors coming back. Since various studies [3,7,8] encourage the use of photos in online communities, we believed that re-designing photo gallery would have an improved and sustainable impact on members' participation.

We proposed personalizing the photo gallery and displaying 'matched' peer photos when members visited CHIplace home page.

This paper reports on an experiment in CHIplace on the design of personalized photo galleries. CHIplace has had versions with and without member photo galleries, and the photo gallery was often cited by members as a valuable feature. Our experiment examines two factors: (1) whether the galleries are populated with random photos or personalized, and (2) whether the user needs to log in to view the photo gallery.

MOTIVATION AND RELATED WORK
Fostering participation in online communities, is an issue that continues to present challenges to designers and practitioners alike. Butler found in his study of online mailing lists that over a period of 4-month more than 50% of the members in a majority of the mailing lists did not post even a single message [1]. Although there are many ways to enhance participation (including applying principles from social psychology [5]), our study investigates the effect of personalized peer photos.

Why match people: People are interested in other people [2], therefore we hypothesize that presenting personalized peer photos would stimulate this interest, and eventually lead to enhanced participation in the online community.

Riegelsberger found in his eye-tracking study that photos attract visual attention the first time they are viewed, although subsequent views with the same layout ignored them [7]. Fogg [3] concluded that on-line articles accompanied by photos can have higher credibility. A recent study in the 'news in print' domain highlights the use of photos in generating interests in readers [8]. Although it concludes that captivating text and headlines are the biggest attractions in an online reading, it also finds that good photos are second only to good writing. These studies suggest that photos are likely to attract attention.

The idea of photo galleries is not new. E-commerce sites like amazon.com and homeDepot.com have been publishing photos online to showcase their products ever since internet became accessible to consumers. Social online communities like orkut.com and friendster.com have been using attribute-based photo galleries to display 'matching' profiles to their members.

Online communities like orkut, friendster and FOAF are close-knit community of friends that are oriented towards building social networks. Their use of the photo gallery feature is within the bounds of these social networks. For example, in friendster.com, if you do not have any friends yet, you will not see any results in the Gallery Search, since

there is no one in your network to return in the results. Similarly, if your network is still small, or your search options too specific, you will not see any results either. Similarly, FOAF presents personalized photos based on a social network that has already been established.

Our approach is different in that we personalize peer photos based on members' profiles and therefore, are able to match people who do not have any (known) social connection yet. We offer matches even for members with minimal profile. We introduce a personalization technique for presenting peer photos in online social communities and hypothesize that it will lead to enhanced members' participation.

RESEARCH QUESTIONS AND HYPOTHESES

There were two main research questions we wanted to address in this study:

(1) Do photo galleries lead to greater participation in an OLC?

(2) Do personalized/matched photo galleries lead to greater participation than random photo galleries?

We hypothesized that:

H1: People will visit more if they see photos of their peers.

H2: People value personalized/matched peer photos more than random peer photos.

H3: People who receive personalized photos will update their profile to get as good as possible matches.

EXPERIMENT

We ran our experiment over six weeks in September and October of 2004.

Profiles model: CHIplace requires visitors to register on-line to become members. Information provided by a member during registration is used to build her individual 'profile', and all these profiles collectively form the 'profiles model'. A typical profile consisted of following information about the member: city, state, country, occupation, interests, CHI conference role (if any), affiliation, SIG membership, mentor experience, volunteer experience, conferences attended, and any extra info that member might have provided. If member had also provided her URL, we appended data from her home page to her profile. Once the profiles model was built, it was updated incrementally every hour via a cron job that updated only the profiles of the members who had joined or modified their profiles within that hour. Out of the 2457 total members, only 602 included photos.

Matching profiles: We use the Bow (Bag of words) toolkit [6] to compute matching profiles for a user. We use the following equation to determine numbers of matches to compute:

Figure 1: Matched photo gallery for Loren Terveen

$$= 2p + 1,\ 0 < p <= 5$$
$$\text{Nos. of photos (n)} = p + 1,\ \ 5 < p <= 45$$
$$= 50,\quad p > 45$$

where p is the number of visits.

We display three photos in the photo gallery. For the matched photo gallery, these photos are selected randomly from the top n matches, where n is determined as explained above. For the random photo gallery, the photos are selected randomly from all the available photos.

We use above formulation so that we can offer a different set of photos to members on their every visit to CHIplace home page. We believe it is equally important that members see a different set of photos in the gallery when they visit the web site, maintaining a good quality of matches at the same time. We believe that unless the photos are presented changeably, they tend to lose their significance, and the underlying importance. Although above formulation does not guarantee an absolute no-repeat policy, it does provide a reasonably good mix of matched photos to choose from.

For presenting matches to new members, we generate their profile on the fly since their profile would not be available in the database until next incremental update.

Gallery design: Based on our research objectives, we presented three designs for the photo gallery:

1. No photos, instead members were displayed a message that requested them to login to see pictures.

2. Random peer photos, with an optional message that requested them to login to see personalized photos.

Condition	When not logged in	When logged in
1. Login	Do not display any peer photos Display message "Log in to see pictures"	Display random peer photos
2. Random	Display random peer photos	Display random peer photos
3. Matched	Display random peer photos Display message "Log in to see pictures of members who match your profile"	Display matched peer photos Display message "Since you do not have your picture in Members Directory, others will not be seeing you :-(" if member does not have her picture in the database

Table 1: Three experimental conditions that visitors to CHIplace were divided into

3. Personalized peer photos, selected from top-matched photo bearing profiles.

Experimental groups: We divided the visitors of CHIplace into three groups - *Login*, *Random* and *Matched*. These groups defined the conditions that visiting members were assigned to, and the presentation strategy for the photos based on those conditions. Table 1 describes the three groups.

Login group was aimed towards studying members' response to the displayed message, and to find out if members are willing to log into the system to see photos of their peers. Getting members to log into the system is important because CHIplace offers more functionality to logged-in members.

Members assigned to *Matched* group got to see personalized photo gallery when they were logged in. This group was aimed towards studying their response in understanding whether members a) log in, and b) edit profiles to get a good personalized match.

Random group was displayed the photo gallery that always had the random peer photos, regardless of the login status of the members in the group. They were not displayed any message either. This group provided us the baseline to compare and analyze members' responses with other groups.

Research subjects: A newsletter was sent out to all the members informing them about re-launch of 'Photo Gallery'. To avoid biased responses, the experiment was not mentioned. (Our Institutional Review Board approved this approach.) During the experiment, there were 109 distinct visitors to CHIplace. Each visitor was assigned to one of the three groups so that there was approximately same number of members within each group.
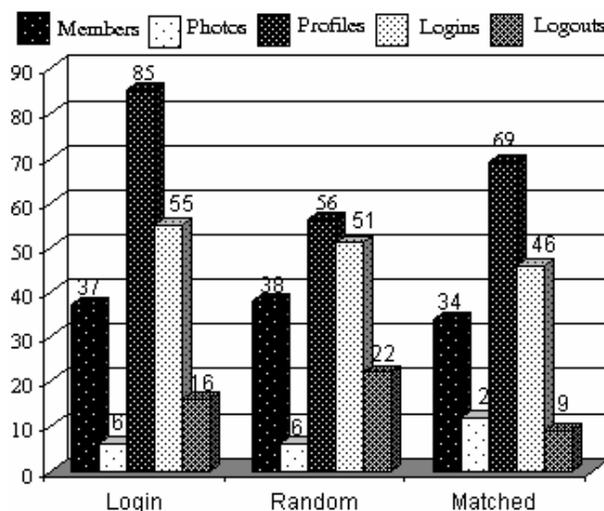
Data collected: We collected members' data about logins, profile updates, picture uploads and all the navigational hits for each group over a period of six weeks. We did not take into account the webmaster account since it tended to impact heavily the group that it belonged to.

RESULTS

We wanted to see whether *Matched* photo galleries lead to greater participation than *Random* photo galleries. We measured this by comparing the number of profile updates, number of photo updates, and number of logins in the three conditions. The number of profile updates for *Login*, *Random* and *Matched* conditions were 85, 56 and 69, respectively. An ANOVA shows that the differences are significant ($p = 0.05$). Number of logins for *Login*, *Random* and *Matched* conditions were 55, 51 and 46, respectively. An ANOVA returned a non-significant p-value of .83. Number of photo updates for the *Login*, *Random* and *Matched* conditions were measured to be 6, 6, and 12, respectively. An ANOVA shows that the difference is not significance ($p = .23$). Number of hits, both total and with members logged-in only, were highest for *Matched* condition, followed by *Login* and *Random.*

The difference in number of logins and logout is due to the fact that we use sessions to maintain members' login status, and members are automatically logged out once the session expires.
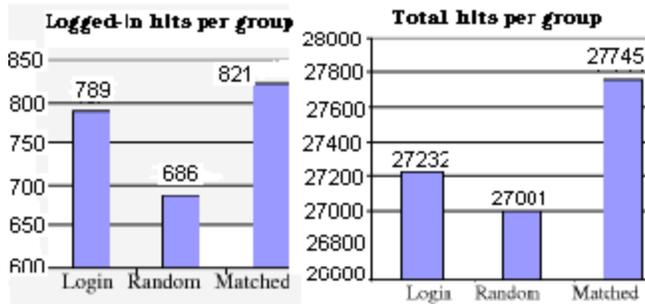

Figure 1: Participation data for different conditions

DISCUSSION

Logged-in hits from figure (2a) and total hits (with members logged in and not logged in) from figure (2b), both favor our base hypothesis that people visit more if they see photos (H1). However, we expected *Random* to have more hits than *Login* since *Random* always displayed photo gallery whereas *Login* displayed it only when the members were logged in.

Login had the maximum number of logins, followed by *Random* and *Matched* (see figure 1). These results do not

Figures (2a) Logged-in hits (2b) Total hits per group

support the hypothesis that people value personalized photos more than random ones (H2).

Results from figure 1 are mixed in supporting our hypothesis that people who receive matched photos will update their profile most (H3). We consider profiles to include photos as well as other personal and professional details. *Matched* had the highest number of photo updates whereas *Login* lead in number of profile updates. *Random* had the same number of photo updates as of *Login*, but scored least in profile updates. These findings encourage further exploration of the effect of photo galleries in OLCs.

We expected the *Matched* group to make the most changes to their profiles, since it was our hypothesis that receiving matched photos would encourage members to update their profiles to get even better matches. Results, however, favor *Login* group in this category. We speculate that this behavior can be attributed to the way our interface worked. We do not differentiate between when a photo gallery is matched versus when it is not, and that, we think is a contributing factor towards low number of logins for *Matched* group.

Matched clearly outscored the other two groups, in terms of encouraging members to update their photos, but the number of photo updated in each category is quite low.

Explicit requests in the form of simple and short messages on the home page of an OLC did have the expected effect. We requested *Login* and *Matched* groups to log into the system if they wished to see pictures, and they responded favorably as is clear from their first and second positions respectively in figure 1. Whether pictures were the sole motivator for members' enhanced response, or members simply wished to take advantage of the new feature, is an interesting question for further exploration. Recall that members belonging to *Matched* group who did not have their photos in the database were requested to update their photos, and as expected, *Matched* had the maximum photo updates. The other two groups, *Login* and *Random,* never received any cue about updating their photos, and hence, have lower results in this category than *Matched*.

An important aspect of CHIplace OLC to be considered when generalizing the influence of photos on members' participation is that CHIplace is a fairly narrow community, consisting mainly of HCI professionals. We acknowledge that including a wider range of members within a community, or wider range of communities in our study would bolster our claims.

CONCLUSION AND FUTURE WORK

Our results show that members do respond favorably to explicit participation requests like logging into the system and updating profile. We believe that this is the very first step in the process of encouraging relaxed visitors to become helpful contributors. In our future work, we will be exploring members' participation from other perspectives like discussion postings, news and event submissions, and interaction with their peers.

ACKNOWLEDGEMENTS

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