
Facilitating Natural Flow of Information among “Taste-based” Groups

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Abstract

Social science studies have shown that the disconnection of people from different social classes or opinion groups may reinforce serious problems to our society (e.g., residential segregation, group polarization, or confirmation bias). With the emerging trend of the Web 2.0, however, different kinds of people are likely having less chance to share information with each other. How to design for supporting better information flow among

different social, taste, or opinion groups of people becomes a challenging question for digital designers. In this work-in-progress paper we present our on-going research of exploring a crowd-based system for facilitating natural information flow among different types of people. We conducted a Wizard-of-OZ study to simulate push-based human powered recommendation, and learn how participants react when receiving unexpected information. Based on the findings, we designed and implemented a web application for encouraging different kinds of people to exchange information in a peer-to-peer way. Next steps include designing pairing strategy and conducting user study.

Keywords

Serendipity; Crowdsourcing; Information Flow

ACM Classification Keywords

H.5.m Information interfaces and presentation (e.g., HCI): Miscellaneous; H.3.3 Information Storage and Retrieval: information search and retrieval.

General Terms

Design, Human Factors.

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Introduction

The term of serendipity is generally defined as the art of making an unsought finding [2]. It describes the moment when people meet fortunate discoveries by chance, or in other words, the accident of finding something interesting or useful without looking exactly for it. Such magic moments often consist of two different but equally important characteristics: the item or the information should be totally unexpected to the person that comes upon it, but he/she would feel it is valuable and interesting once presented to him/her.

Designing a city that increases the possibility for its citizen to receive serendipity information has used to be a challenge for urban planners, because in a free society the understanding between people from different social classes is often achieved by discussions and communications. To achieve more peaceful society, city designers need to develop the city architecture that makes different kinds of people mingle automatically [11].

The Internet was supposed to improve the communication between different kinds of people. However, it did not work that well as we expected. The Information Foraging Theory [12] suggests that humans are inherently trending to consume as few energy as possible to get the information they're seeking. Which means people would reasonably prefer using searching-with-keywords or recommend-by-system approaches rather than browsing information. Hence, technologies such as social media, recommendation engines and search engines have succeeded in the market and brought significant impact on people's information accessing behavior. However, via these emerging information channels people may lose serendipity. It

might be difficult for current algorithm to recommend information that is "truly unexpected" for people, since the recommended items are mainly selected based on users' historical behaviors, i.e., things they "already" like. On the other hand, a report shows that 48% of the American youth says they receive a big portion of their news through Facebook [8]. On social media user basically receive information that is shared (or in other words, filtered) by their friends. However, as the Homophily Principle indicates, "birds of a feather flock together" [10], people naturally like to be friends with people that have similar minds. Thus, friends on social networks normally have interests in topics that closely resemble each other. Consequently, other than improving communication, the popularity of Web 2.0 may actually arise the Echo Chamber problem [9] in the digital world: having on-line (virtual) communities where people's existing beliefs are reinforced and they are not exposed to different voices.

Consequently, the design for better information flow among different communities has also become a rising challenge for digital designers [13]. A number of previous researches (see [1] for summary) have studied the relationship between social media, World Wide Web and serendipity. Many of the research prototypes (e.g., [7, 5, 3, 4]) as well as commercial applications (e.g., Hunch¹ or StumbleUpon²) have tried to design better algorithms for supporting serendipitous information discovery and recommendation. However, authors of [2, 6] argue that such solutions could (at most) provide "controlled serendipity" but may difficult to achieve "real serendipity":

¹ <http://www.hunch.com/>

² <http://www.stumbleupon.com/>

"Pure serendipity is not amenable to generation by a computer. The very moment I can plan or program 'serendipity' it cannot be called serendipity anymore. [2]"

Our point of view to this issue is somehow different. To solve the described problem, we aim to involve human in the process [15]. Our goal is to build a social networking service where people of different social or "taste" groups could naturally exchange information in a peer-to-peer manner and thus improve the flow of dissimilar information. In the meanwhile, the system should hide its design purpose from the end-user, and appear as a more interesting service such as a "social dating game", in which a user would recommend items (e.g. URLs of Web content, photos) for another user (from a different "taste group") based on the user's profile, and earn points if the other party likes it. The points could be used to unlock other user's contact information, send virtual gift, and so forth. Improving the chance to obtain serendipitous information would be a by-product of the service. In other words, instead of developing a machine algorithm to handle the information recommendation task, we would like to concentrate on building a community that allows the information to flow smoothly among the autonomously formed "taste-based" virtual groups. We aim to create a serendipity moment that is when valuable and interesting information naturally comes to people in a push-base manner.

Preliminary Study

Before implementing the actual application, it is beneficial to first investigate the feasibility of the design with potential end-users in a lightweight manner. Hence, we conducted a Wizard-of-OZ study to learn about how participants react when "unexpected" information does

come to them, what may affect their preferences, and in what format the information should be presented.

We broadcasted our invitation using Twitter, Email, and Facebook. In total 32 subjects agreed to participate and eventually 25 of them completed the study. Out of the 25 participants, 7 (28%) were female and 18 were male, age from 19 to 41, average 25. Nearly half of them (11) were Japanese, and the rest were from US, EU, China, and Australia. Their backgrounds included student, marketing, research, food service, and education. Moreover, all of the participants claimed they used on-line media and/or social media as one of their primary information sources. The study was designed as follow:

1. A pre-study survey was given to participants, which consisted of a questionnaire designed for collecting data that is necessary for building a basic user model. This survey included questions regarding user's demographic information, hobbies, favorite books, music, movies, food, travel destinations.
2. Then the authors coded survey and conducted a human-powered recommendation based on participants' profile. For each subject, authors prepared 5 different items on various topics (e.g., movies, music, people to follow on Twitter, food, Website, sports, travel destinations, books, videos, games) and media types (e.g., plain text, text with image, image, audio, and video). To study whether media type affects participants' satisfaction, experimenters provided same content in different media type to different subjects.
3. The prepared items were presented to participants with a post-study survey. The users were told the

items were recommended by a “system”. The post-study survey included questions related to the preference of each item, and open questions such as which is the most liked / disliked item and why.

In total we presented 102 items to the participants. All subjects reported that, of the five received items there was at least one item that could be considered as serendipity information for them. Moreover, 21 (84%) subjects considered their most liked item was a serendipity information to them and 20 (80%) participants considered their least liked item was a non-serendipity information. Moreover, in the open questions subjects described their “pleasant surprise” of the serendipity items and expressed their satisfaction and willingness to share the items with friends. Overall, the results shows that the participants have positively feedback when new, surprising and interesting information was pushed to them.

The most liked topics were various, but we noticed preference differences between Eastern and Western subjects, although we had no intention to have a cross-cultural comparison at this stage. Eight of the Japanese participants considered the “*interesting*” and “*funny*” item as their most favorite one. While the most popular reasons for Western participants to like an item was “*provided different point of view*”, or “*educational*”, e.g., documentary movie about global issue, Non-profit project, etc.

Regarding the media type of the items, three of the most liked items and three of the most disliked items were presented in pure text, and the rest were in rich-media types. Meanwhile, there was no single case that two items with the same content but different media type

had been given opposite comments (i.e., liked and disliked). These results may suggest that the media type did not significantly affect the judgment of the item and what participant cared about is the content.

Crowd-powered Information Exploration

To further explore the feasibility of building a crowd-powered information exploration system, we designed and built a prototype that is a social web application. As a main functionality it recommends each user one URL item per day that has been especially selected and prepared by another user in the system. The two users, i.e. the one who receives the item and the one who has prepared it, has been selected by the system based on their profiles about their background and interests, registered in the system. The receiving user also rates the received item. A screenshot of proposed prototype is shown in Figure 1.

Our goal is, in the proposed system, people of different social, “taste” or opinion groups could naturally exchange information in a peer-to-peer way by exchanging URL items between them and thus improve the flow of dissimilar information. On the other hand, the system hides the “design for serendipity” purpose from the end-user, and appears as a more interesting service such as a “social dating game” in which one of the main user’s goal is to “surprise” his/her partner with something interesting online. Improving the chance to obtain serendipitous information could be considered as a by-product of the service. In other words, instead of fully relying on algorithms to handle the information recommendation, we aim to build a community that allows serendipitous information flow smoothly among the autonomously formed “taste-based” virtual groups.

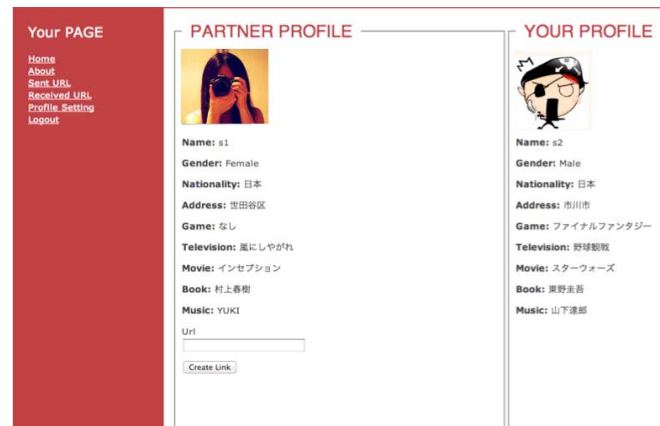


Figure 1. A screenshot of the prototype.

For better understanding of the proposed application's usage we give the following scenario:

"Daniel is a user of a social networking service called SurpriseU, where he has created his own profile by filling in his basic background information like gender, current city of residence, and his areas of interest such as favorite movies, books, and music.

Every day Daniel is looking forward to opening his computer, when the service recommends a link to him. Today, he has received a Flickr picture of an extremely beautiful lake called "Salar de Uyuni". The lake is located in Bolivia, before today it is just an unfamiliar country in the other side of the earth to him. Immediately he starts looking for more related information and even starts thinking of going there next summer. The system also assigns to him the profile of one another user every day. Today it is the profile of a ballerina dancer from

Tokyo. He reads her information, and remembers that few days before during a local meet-up he has seen an impressive short film about architecture design in his country, Iceland. Daniel decides to send the YouTube link to her. He hopes it is something new and interesting for this girl, cause her good evaluation will also increase his points in the system and give him more enjoyable benefits of the application. "

Conclusion and Future Directions

In this work in progress paper we describe the idea of improving the flow of serendipitous information among people via crowdsourcing. In the current stage of the design, such communication is achieved by the exchange of URL items among the users, which are expected to improve the smooth flow of dissimilar information and communication among different types, tastes, or beliefs communities.

The future challenges include the attempt to utilize users' social media data to build a richer user model that is suitable for such system, rather than just relying on user's input. Additionally, atop of the user model, what pairing strategy we should design is another future question. Based on the preliminary study we learnt that the fundamental requirements of selecting the pairs would be one in which, on one hand, participants' background knowledge and interests are "far" enough so that they can surprise each other with information that usually does not reach them. On the other hand, the contents of the item prepared for a particular user even though a "surprise", should have a "link" with the user (i.e., his/her background, interests and so on) in order to keep him/her still interested in the totally new information. We need to be able to assign different

weight to different facts (i.e., age, city, gender, favorite books, etc.) and design strategy to decide what facts would be better used as the "link", and vice-versa.

Moreover, it is also interesting to investigate how to design incentives to improve the overall engagement. As discussed before, we would like to verify the idea of Dating-Game-With-a-Purpose [14], utilizing the emotion between different genders to motivate users. Eventually, we need to conduct user experiments to proof the feasibility of the system, the effectiveness of the user modeling, pairing, and incentive mechanisms. Another challenge brought in is how to evaluate the quality of the results, i.e., the "Serendipityness" of the information.

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