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A Facebook Companion for an Adaptive Social Site

Introduction

Social networking sites are a type of virtual community that grown tremendously in popularity over the past few years, and they are also increasingly attracting the attention of researchers intrigued by their affordance and feature (Boyd & Ellison, 2008).

Online social network has been used to promote product, services, and organization by spreading information among social connections. Eventur is an online community providing information about local events in Pittsburgh. Eventur completely relies on users to collect local cultural events and contribute to the system, serving as a content integration platform. Meanwhile, the system provides community features by giving the users online identity and provide social features, such as friending and recommending events to each other.

Problem Statement

The problem of the current Eventur system is the limited user activity and low contribution. Having discussed the problem with Dr. Brusilovsky and Danielle, we are facing two alternatives to address the problem.

The first alternative is to develop a Facebook application with a wide range of functionalities to view and share event information from Eventur on Facebook platform. While we were discussing with Danielle, the developer of the system, concerns were raised as how to retain the users in the domain of Eventur. If the Facebook application duplicates or overlaps the features of Eventur, existing users would have no reason to remain at Eventur and prospective users would have little motivation to try Eventur. Experience of daily Facebook users suggests Facebook application is not used every time users log on to Facebook. If not properly designed, the application faces risk of elimination.

Based on all these factors, we propose the other alternative, which is to develop a Facebook page which serves as an information portal to reach more potential users. The Facebook page has limited functionality. When the user clicks on the post link, he/she gets redirected to event detail page on Eventur domain. In such a way we utilize the Facebook as a “sidewalk” sale of various kinds of information, which draws the “pedestrian”, the users, to our system.

Along with the interaction and visibility of Eventur, we also plan to enhance the visual representation of the Eventur website. The original interface has some limitations in its visual representation, such as the text-image proportion and the arrangement. In the previous webpage of Eventur, the proportion of the images and icons is relatively low and makes it difficult to attract users' attentions. On the other hand, the information architecture of the user profile page and the bookmark page are not intuitive nor clear enough. As an online community website, the user dashboard is always a "getting-start" point for users. The importance of the usability of the user profile interface is now more important than ever. We suggest a whole new design of the user profile interface in order to improve the problem as we state above.

Implementation of Social Features – Shaopeng Zhang

(1) Importing user connections on Facebook

In order to facilitate the information diffusion of Eventur, we implement like buttons with Facebook social plug-in. Also, in order to import the existing comprehensive connections among users and explore the interactions among them within the Eventur domain, we implement a Facebook application to import friend list.

Every user who has authenticated the application leaves basic profile information and friend list in our system. When enough users have imported their connection information, we can analyze them and establish connection among Eventur users based on their Facebook account.

```

mysql_select_db("ClickFromLog", $link);
$id = uniqid($_GET['rec_media']);
$timestamp = time();
$time = date("Y-m-d H:i:s");

$query = sprintf("INSERT INTO FriendList (uid_e, uid_f, list_str, timestamp)
VALUES ('%s', '%s', '%s', '%s') ON DUPLICATE KEY UPDATE list_str='%s'",
mysql_real_escape_string($id),
mysql_real_escape_string($_POST['uid_f']),
mysql_real_escape_string($_POST['list_str']),
mysql_real_escape_string($time),
mysql_real_escape_string($_POST['list_str']));

$result = mysql_query($query,$link);
if(!$result){
    echo "<result>". "fail". "</result>";
    // die('Error: ' . mysql_error());
}
else{
    echo "<list>".$_POST['list_str']."</list>";
    //echo time();
}

mysql_close($link);

```

Intermediate service importing user connections on Facebook

uid_e	uid_f	list_str	timestamp
4d04108e934d0	1513041589	1621077,6833496,14228790,14233700,64701426,3489003...	2010-12-11 19:00:14
4d0412312c4e1	100000995595432	517467883,1513041589	2010-12-11 19:13:32

Figure 1 Database design for user connections

(2) Setting up Facebook page for Eventur

We implemented a Facebook fan page to increase the visibility of Eventur by making the information on Eventur available on the Facebook, the prevalent social platform with millions of people.

Eventur has already configured a basic RSS source which outputs 25 current and future events and updates daily. On the Facebook side, we have an application called RSS Graffiti which aggregates RSS sources and provides scheduling functionalities. However, the RSS serves data source to multiple systems (e.g., iSchool touchscreen by Shaopeng Zhang and Wei Jeng), so the format and content is not specifically configured for the Facebook page. For example, the title did not include the date and time, which is important for Facebook page post to indicate events time. In order to connect the raw source and Facebook, we construct several filters to filter and re-format the original content.

We use Yahoo Pipes to read the original feed and filter items according to time and types. According to time, we configure filters for events coming in 4 days and ending 20 days. We can also filter events according to event types, but currently there is lack of data to cluster users' interests.

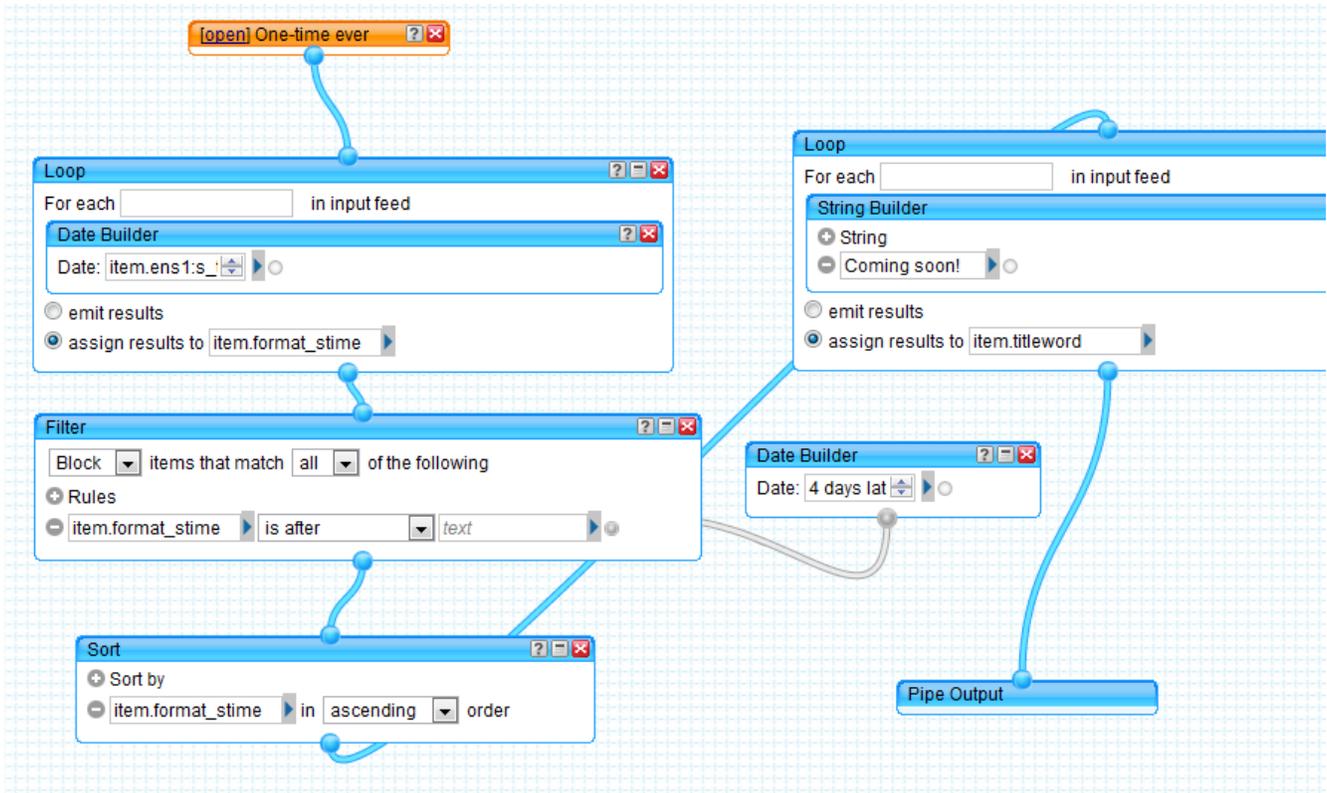


Figure 2 RSS filters for events to be posted on Facebook

After the Eventur page was set up, we invite 30 friends of the development team members and let the community grow by itself. Within two weeks, the fans grow to 74 users. And visit to Eventur has seen almost 10 times than before.

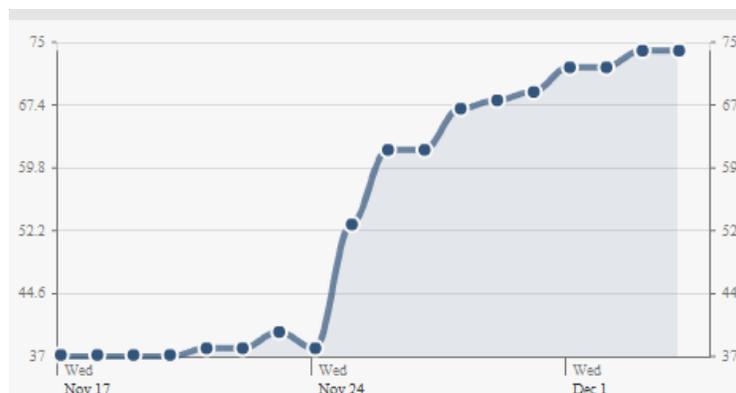


Figure 3 User growth over the first two weeks

After the filters have been set up, the application automatically retrieves the event information and post on the Facebook fan page. Our fan page checks the source every other hour to make sure events available is posted as soon as possible, and they are not posted one after another too soon to overwhelm the user's new feed page.

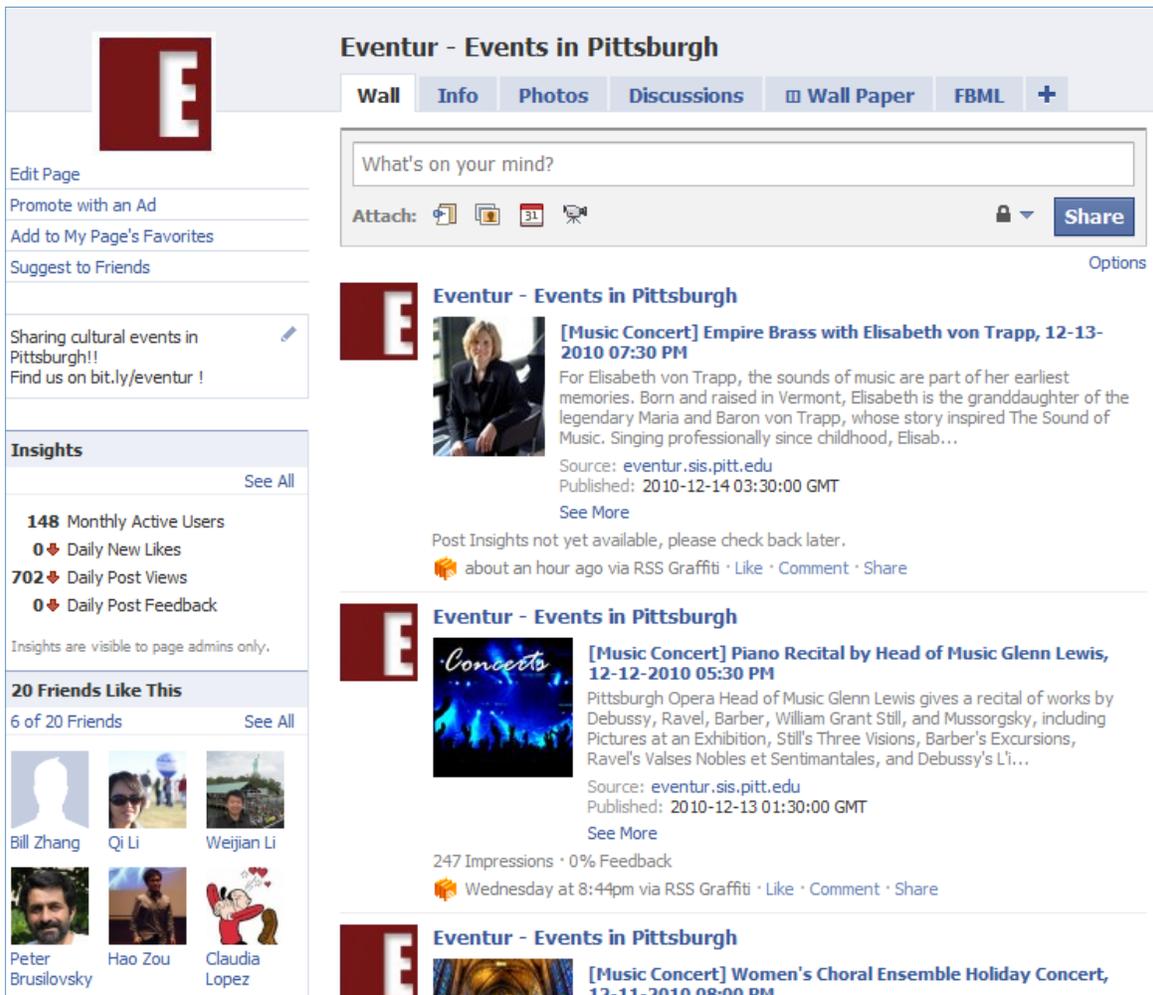


Figure 4 The actual look of Eventur page

Facebook also has a powerful tool called insights for Facebook page administrators to view and analyze the user and interaction log of the page. With this tool, we can conduct time-series observation and the statistics provide us with measurable feedback of improvements.

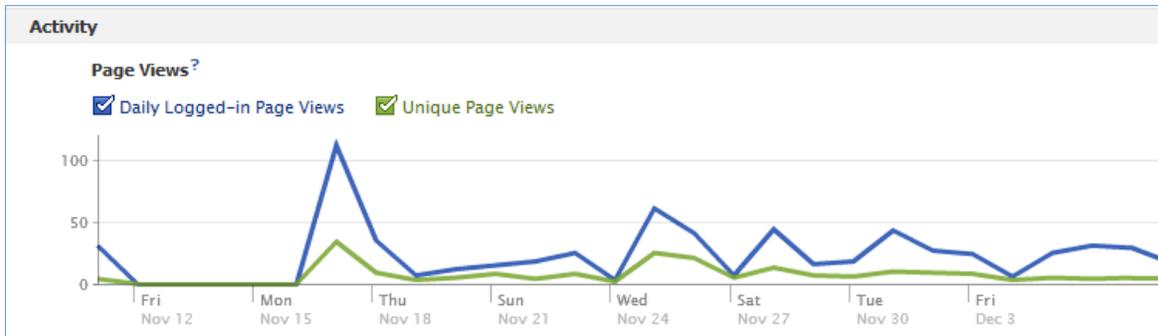


Figure 5 Facebook insights showing page view statistics over time

Design of Visual Elements -Wei Jeng

(1) Suggest the arrangement of the “Similar Events”

According to Latour (1990), the image is one of the most powerful explanation method while delivering the information or messages. As the one of primary features of Eventur system, there is a *Similar Events* below every event page. Through the approach that reducing text label and adding thumbnail images, the column of Similar Events become more attractive and visible.

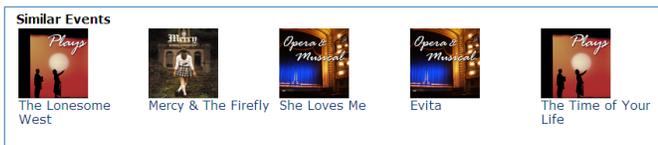


Figure 6. The visual display of event page on Eventur website

(2) Design the Default Images for 12 categories

In the past, if a user did not upload a related image when creating a post, the system would not display any image of that post. It will be difficult to attract people’s attention without any image, as the Figure 2 illustrated.

Twelve images are selected from Flickr™ which are under Creative Commons license. After basic editing, 12 default images are available for use (Please see the Figure 3). If a user creates a post without uploading any relevant images, the current system will assign a default image based on the category the user selects.

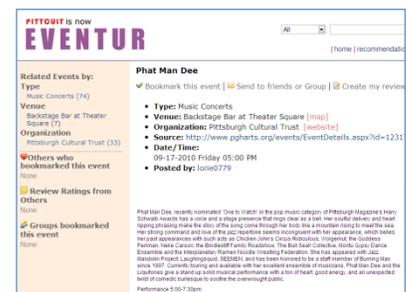




Figure 7. Twelve default images of Eventur

(3) Design the Favicons for Eventur

A Favicon is a tiny icon that will appear in the bookmark or the address bar of a web browser. With a favicon, a website can be easily identified and recognized by users. Since the logo of the Eventur uses the font type-- Impact, the design of Evenur's favicon use the same font type (Please see the Figure 4).

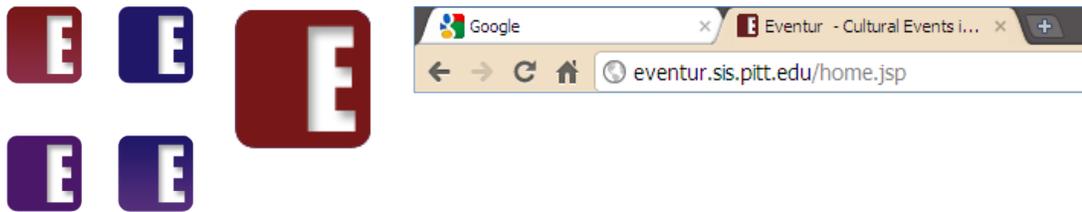


Figure 8. The Favicon of Eventur

Designing the User Profile Dashboard- Wei Jeng

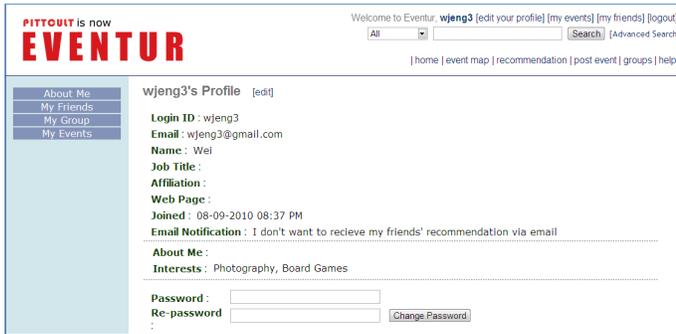


Figure 9. the current User Profile Page

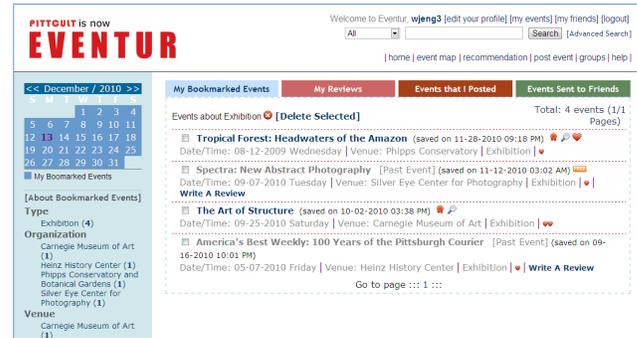


Figure 10. the current My Event Page

The current social features in the Eventur website are separated into two interfaces: the User Profile page (Figure 5) and the “My Event” page (Figure 6). The new interface we suggest has three major features (Figure 7 & 8) to solve the current problems as state above. First of all, the new design will *combine the functions* of profile page and the “My Event” page so as to integrate all customized services into a single dashboard. Secondly, we design a *tabbed interface* to switch the different pages. A tabbed interface can keep the operating interface remaining its primary position. We also reduce textual labels and make them display in a visual way, such as visualizing the bookmarks and friends as thumb-nail images.

The default page of the new user dashboard is “News Feeds.” This page will display the updates from the users and their friends. At the meanwhile, the feature events and the other social features such as the events shared by friends or the events the friends bookmarked are also showed with the thumb-nail images.

The other layouts of each tab are illustrated as Figure 8. Following the same goal- to enhance the visual representation, we reduce the textual

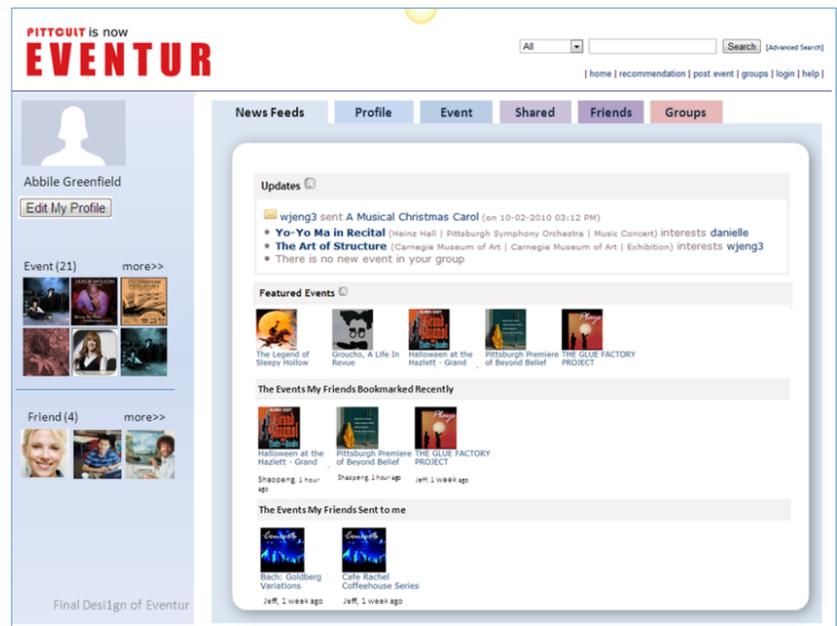


Figure 11. The new user profile interface we suggest

proportion and use thumb-nail image and icons to visualize the arrangement of webpages.

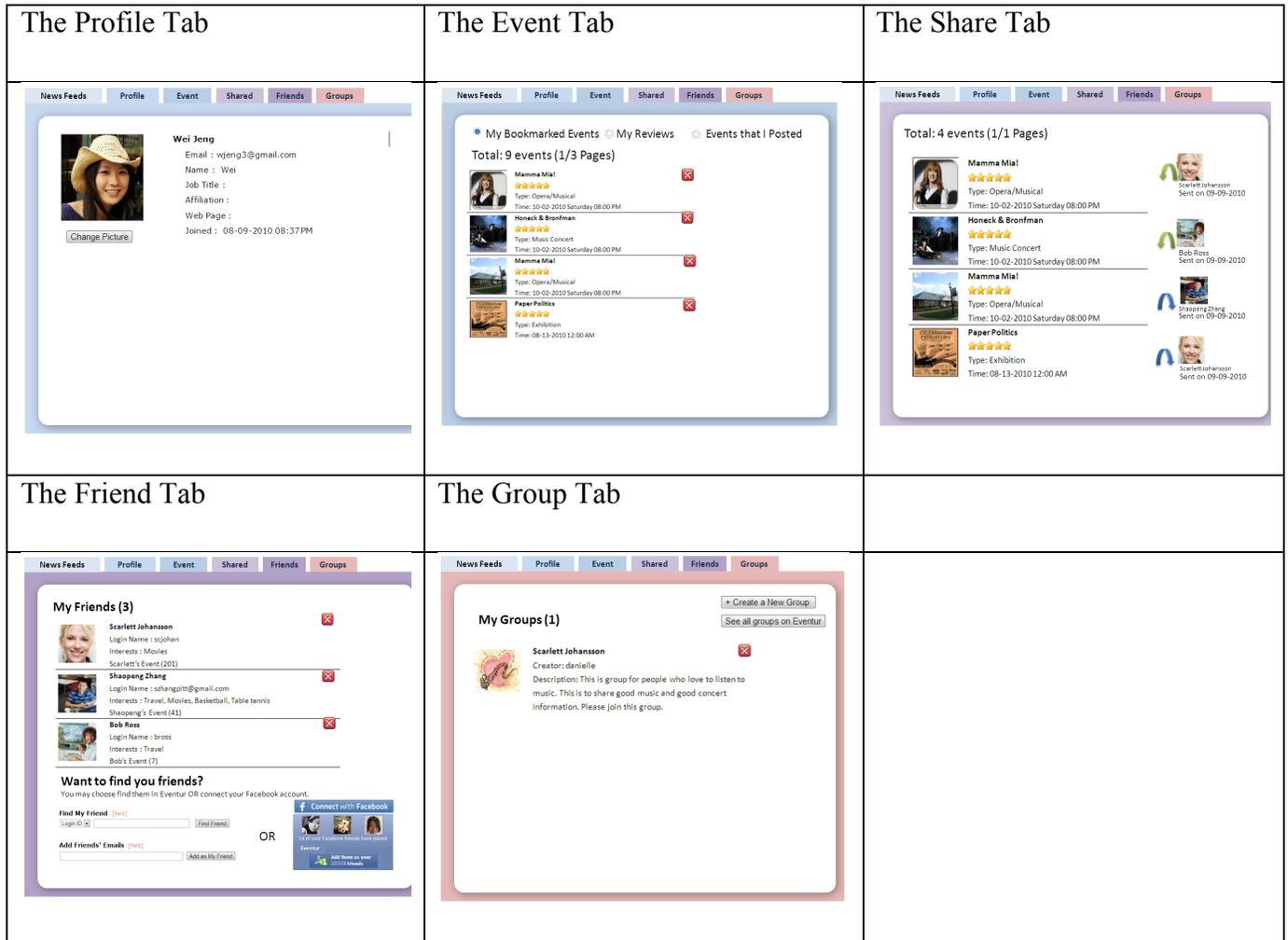


Figure 12. Each page of the user profile page

Assessing Registering Process – Wei Jeng

(1) Annotate Bibliography

Before running the user interview, we conduct the literature review on the topic of the characteristic of online group activities.

Butler, B. S., & Irwin, J. (2010). “ You Are Not Alone ”: Effects of Highlighting Social Aspects on Responsiveness , Joining , and Profile Information Sharing in an Information Portal. *ASIS&T 2010 Annual Meeting*.

This article aimed to examine the impact of adding and highlighting social features on new user enrollment. The authors addressed two common methods of highlighting social aspects are to mention them in the invitation which were sent out to the prospective users and in welcome pages which can be seen by new users when they visit the site at their first time.

The major hypotheses was considered that by means of emphasizing social features in an information portal, it will affect new users’ decisions to join the site or even share their information. The information portal adapted in this study was the Dental Informatics Portal. The site served information resources for dental informatics and technology. The result showed that the hypotheses were not fully supported. The researchers in this study did not find out crucial obvious casualty of the hypotheses and the results. There were even unexpected negative relationships between welcome message and user engagement, which showed that highlighting the presence of social features may not always be the optimal presentation strategy.

This study provides a research framework of examining the relationships between user engagement, contribution, and the social feature added to the website. Future researchers may benefit from the design of experiment setting and

Butler, B., Sproull, L., Kiesler, S., & Kraut, R. (2007). Community Effort in Online Groups: Who Does the Work and Why? In S. Weisband & L. Atwater (Eds.), *Leadership at a Distance*, pp 171-194. New York: Lawrence Erlbaum Associates, Inc.

Like any other real-world social organizations, members supporting and contributing is also necessary for an online virtual community to maintain its operation. This study aimed to find out the major reasons why people put their efforts on a virtual community.

The authors conducted literature reviews and then listed four types of benefits that driven community members to contribute themselves: visibility benefits, information benefits, social benefits, and altruistic benefits. To examine the consequences, the researchers in this study conducted an online survey which sent to an Internet listserv in 1998. Around 3,000 people consisting of owners, active participants and silent participants from 212 different listservs were selected for this survey.

The findings showed that the owners perceived altruistic benefits to be more important and the information benefits to be less important. For silent participants, they considered information benefits to be the most significant important.

Erickson, T., & Kellogg, W. a. (2000). Social translucence: an approach to designing systems that support social processes. *ACM Trans. Comput.-Hum. Interact.*, 7(1), 59-83.

Social translucence is a core element in online social network sites such as Facebook or LinkedIn. Three characteristics were described in social translucence, visibility, awareness, and accountability, which enable people to draw upon their social experience and expertise to structure their interactions with one another. First of all, the visibility. Authors indicated that, as human beings, we are more likely to pay attention to the human faces and figures-- we will notice and react to them more than some printed sign. On the other hand, when people expose their identity online, they will be more accountable for their behaviors and actions, comparing to being anonymous. This is the third characteristic in the social translucence. This article provides a theoretical perspective that can be added to our future study.

Ridings, C. M., & Gefen, D. (2004). Virtual Community Attraction : Why People Hang Out Online. *Journal of Computer-Mediated Communication*, 10(1).

The authors indicated that over the last 25 years, the membership in face-to-face types of community, such as bowling leagues, neighborhood picnics, has fallen rapidly. Instead, we may see

more and more memberships and activities held in an online virtual group. Virtual community has been characterized as people with shared interests or goals for communication and interaction. Comparing to join a real-world group where is in general for both feeling of affiliation and belonging as well as for information and goal achievement, motivations of joining a virtual community were examined in this study: information exchanging, social supporting, maintaining friendships, and recreation.

Authors selected 27 online communities, asked them about the motivation of joining their virtual community, and then collected and analyzed the content. Around 400 people were responded to the survey in five days. The research data suggested that people visit virtual communities because of the opportunities that create exchange information, social support, and friendship. It also predicted that the social support and friendships will play more important roles in the near future.

(2) User interviews

We conduct the user interview to assess the user sign-up process to examine whether there is any usability problem with the process that impedes the user growth. At the meanwhile, we also get users' feedback of their willingness to import their existing profile on Facebook.

Nine participants are interviewed in this study. Our participants are selected based on two major characteristic: who are actively Facebook user and the first time user of Eventur website. All participants are grad students or the PhD students from University of Pittsburgh or Carnegie Mellon University. Before conducting the interview, we send a questionnaire to each participant, in order to gather their usage of the Facebook. The following table illustrates the personal background and the usage of the Facebook.

#	Gender	Background	How frequently do you access your Facebook account?	What kind of activities do you usually do on Facebook?	In your personal device, do you allow your browser to remember your Facebook password?
1	Male	ME master	several times per day	Browsing News Feeds, Viewing / sharing photos	YES, always
2	Male	IS PhD	several times per day	Browsing News Feeds, Replying & Tracking the comments/ posts that others leave for me/my friends, Viewing / sharing photos	YES, always

3	Female	BioTech master	several times per week	Browsing News Feeds, Replying & Tracking the comments/ posts that others leave for me/my friends, Viewing / sharing photos	It depends, but more likely "YES"
4	Female	LIS master	several times per day	Browsing News Feeds, Playing games/ fun tests	NO, I always type my password before each login
5	Female	LIS master	several times per day	Browsing News Feeds, Replying & Tracking the comments/ posts that others leave for me/my friends, Viewing / sharing photos	It depends, but more likely "YES"
6	Female	LIS master	several times per week	Replying & Tracking the comments/ posts that others leave for me/my friends, Playing games/ fun tests	YES, always
7	Male	Engineering under	several times per hour	Replying & Tracking the comments/ posts that others leave for me/my friends, Viewing / sharing photos, Writing a Note/ Blog	YES, always
8	Female	FL master	several times per day	Replying & Tracking the comments/ posts that others leave for me/my friends, Viewing / sharing photos, Playing games/ fun tests	It depends, but more likely "NO"
9	Female	LIS master	less than several times per month	Browsing News Feeds, Viewing / sharing photos	It depends, but more likely "YES"

Table 1. the personal background and the usage of the Facebook of participants

Each participant is asked to share their thoughts on three major topic:

a. The motivations of joining a particular social networking website

In this question, we do not set any limitation of the target website. Participants are free to share their opinion about any relevant experience while they becoming a member of any kinds of online groups. The most important motivation factor of becoming a member of a website would be the *information provided* (5 of 9 mention), the *materiel benefits* such as e-coupon (4 of 9), the *force of a third party*, such as their teachers telling them to try (3 of 9), and the “*just follow my friends*” (3 of 9).

b. Which is you preference? Filling the form or importing your Facebook profile on Eventur?

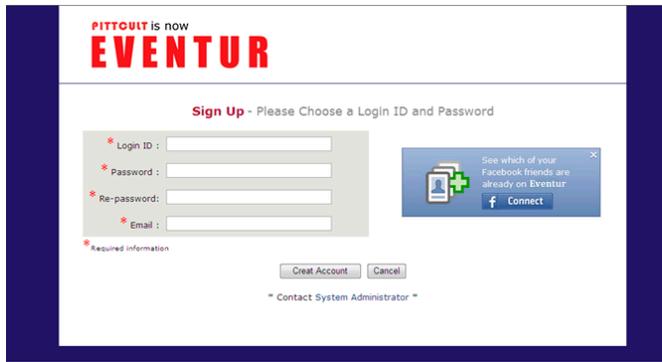


Figure 12. The pseudo sign-up interface of Eventur Figure 13. the sign-up process of aNobii website

Firstly, we show a “pseudo interface” to our participants, as the Figure 14 stated below. The storyboards which provide to the users are cropped from Eventur website and the aNobii which is an online book club website. The importing process is recoded by Jing, a screen capture tool, using the aNobii website to illustrate the whole signing up process for our participants (<http://www.screencast.com/users/wjeng/folders/Jing/media/b5cb017d-c35a-455e-8088-8cae7b31e622>).

While asking users about their preference between filling the form on Eventur and importing their profile from Facebook, seven out of nine participants choose to type their profile information themselves. Most users in the group choose not to import their Facebook profile because of the trust and the privacy concern within social networking sites. With the growth of the popularity of Facebook, the concern of online privacy has been continually rising, particularly in these two years. The users’ preference may be influenced by the public opinion and self-experiences.

c. Are you willing to connect / import your friend list into the Eventur website?

In this phase, we also use Jing to record the process of importing the friends who are already on aNobii website from Facebook (<http://www.screencast.com/users/wjeng/folders/Jing/media/92dce2ab-1e73-4443-8e12-52de653cf89a>). Eight of nine participants decide not to import their friend list. The major reason is that they are not willing to make their activities visible on the Eventur (8 of 9).

(3) User suggestions

Besides the willingness of importing their existing profile and friend lists from Facebook, we also gather some valuable suggestions from the participants. Based on the current sign-up process of the Eventur, all subjects satisfy with the current process because it is easy to use, time-saving and no

detailed information required. However, several improvements could be made to the *description* of the *website* to enable it to better convey its task and functionality to the users.

Users also indicate there are no significant differences between anonymous users and registered members; in this way, a general user might choose not to register as a member since one can still access or obtain the most information in the website being a member. In fact, members in Eventur can actually benefit from several features, such as bookmarking, friending, getting recommendations, creating posts, and so forth, yet users claimed they cannot discover these features or functions at a quick glance. Therefore, the affordance of these special features that provide for members needs to be highlighted. The benefits for “becoming a member” should be also illustrated in front of the users.

With the launching of Facebook Page, *Eventur - Events in Pittsburgh*, most users express that they are more willing to click a *Like button* on the Facebook Page instead of registering as a member in the original Eventur domain. One of two major reasons is that users does not feel like registering another platform which is outside of Facebook. Besides, the RSS feeds of the Eventur website make the event information visible on the Facebook Page. In this way, users can obtain the messages that they think they all need as much as the website provides.

Overall the current sign-up process received positive reviews. By addressing a few problems, such as the lack of description of the system, the Eventur website will prove significantly more informative and usable.

Future Work: Potential Research Aspect

The study of information diffusion through social network has raised researcher’s attention. Sun et al. conducted an empirical investigation using 262,985 Facebook Pages and their associated fans. They find that because of the connectivity of the Facebook network and the ease of Page fanning, the maximum length of diffusion chains from initiator nodes can sometimes be extremely long, especially in comparison to the diffusion chains that have been observed in other empirical studies of real-world phenomena. In fact, they have observed chains of up to 82 levels in our complete data set. It may be interesting for marketers and practitioners to note that when compared to real-life studies of diffusion, Facebook chains of Page fanning tend to be longer lasting and involve more people: in a study of word-of-mouth diffusion of piano teachers, Brown and Reingen (1987) found that only 38% of paths involved

at least four individuals [14]. Using the same definition on the Facebook data, Sun et al. find that for a random sample of 82,280 Pages, 86.4% of paths of Page diffusion involve at least four individuals. This result may be useful for potential advertisers considering a Facebook marketing campaign versus more traditional word-of-mouth methods.

Although the studies above have analyzed massive data set and provided strong evidence of success using Like Page at a macroscopic scale. Some detailed schemes (e.g., format, media, scheduling) for a page under microscopic scale are still missing. Moreover, a continuous case study for a specific page from its infancy is necessary to understand the development of a page and factors affecting its development. Therefore, we will start a Like Page for Eventur and keep track of its development from its infancy.

We will study three questions. The first is to explore the scheduling strategy for fan page promotion. We will conduct controlled experiment to find the correlation between posting time (morning, noon, and evening) and the impression (i.e., number of times the post appears on user's news feed) to find the optimal point of publishing events to acquire maximum visibility. The second is to study whether the highlighting of localized event will attract more user's attention. The third is to study whether the highlighting of a free event will attract more attention from the users. For the second and third question, we will control the message in an event post to highlight target features. We choose to focus on localized characteristics because of the task of Eventur, to provide local events to large amount of local users. Indeed, out of 76 current fans, 67 of them are located in Pittsburgh. We choose to study the "free" highlighting because we did not see much difference in the original system between free events and paid events, which is in contrast of the hypothesis. In this study, we try to highlight "free" in a social context and we try to see whether it would be a different case.

Meanwhile, we will conduct surveys to users to ask about their subjective perspectives about our promotion approach. We will then compare them against the data we collected and try to find some insights into promotion strategy from both objective measurement and subjective findings.

Reference

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