

# The Design of Activity-Oriented Social Networking: Dig-Event

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## ABSTRACT

In this paper we present the system design and rationale for a novel activity-oriented social networking site called Dig-Event. This system extends our previous work on event based consumer mashups and is inspired by research on popular social network applications. Dig-Event provides an open, social space for users to share events and discover the activity of mutual interest among social contacts like schoolmates, families, friends and colleagues. It allows users to share their activities to the customized social circle, conduct events by selecting activity-based gadgets, and socialize around them. The features of event recommendation and integration with existing social networks further boost the event socialization experience.

## Categories and Subject Descriptors

H.5.m [Information Interfaces and Presentation]:  
Miscellaneous.

## General Terms

Design, Experimentation, Human Factors.

## Keywords

Activity, calendar, event, social network, social web, mashup

## 1. INTRODUCTION

Social networking sites are often thought of as places to catch up on the personal information and current activities of social ties [5]. The efforts have facilitated consumers to stay connected to their favorite social networks by user-generated content: users create, upload, and interact around contents by sharing, rating and commenting. In this evolving landscape, social networking players are constantly looking at ways to provide innovative features to keep users stick to their networks [1].

This research is a follow-up to our previous study on consumer mashups [6] [7]. Two lessons have been learned from the user acceptance of mashups are: on one hand, mashup developers who target the less programming savvy user group should pay particular focus in bringing value to organize better existing day-

to-day activities. On the other hand, sharing and collaboration in consumer mashups development has a positive effect on performance and effort expectancy, i.e., to allow users to share and collaborate can improve the usefulness and ease-of-use attributes of consumer mashups. These inspire us to think the possibility of having activity based sharing and collaboration in a broader sense, not only limited to mashups.

Recent research on online social networking sites has shown that people have appreciated the communication channels that these sites afford to perform a variety of tasks, including socializing around and coordinating events [5]. Followed by the question “Does activity play an important role in social interactions and relations?” we present Dig-Event (Do-it-together Event), an activity-oriented social networking system for users to collaborate and participate in activities of mutual interest. Our system integrates ideas drawn from designs of one’s social network into an open calendar tool, providing a space for users to share events, socialize around, and discover what else is going on in their network and beyond. This paper reports on the rationale and design behind Dig-Event.

The Dig-Event design is based on a few observations. *Firstly*, there are a number of web sites that support “official” event sharing/discovery and meeting like-minded people, such as Going.com, Upcoming.yahoo.com or Eventful.com. Dig-Event targets towards the niche domain of activity-oriented social communication among existing social contacts. It allows users to solicit participation of “day-to-day” activities from known contacts: schoolmates, friends, family, and colleagues.

*Secondly*, traditional calendar deals with the event attributes like “what”, “when”, “where”, “who”, however, it cannot assist users to plan and organize the event. Dig-Event feature fills the gap by enhancing the traditional calendar with “how”, by assisting users to organize the events through selecting their own favorite gadgets.

*Thirdly*, Dig-Event let you sort out the friends by easy customization of groups. While one user may want to share a work-day lunch event only to colleagues at work, a proposed visit to a museum event by the same user would be published to family members and friends. Based on the Google+ asymmetric sharing model, Dig-Event social networking aspects serves a good fit for situations like these - enable you to create mini friend lists within your larger network to limit who can see which of your update.

*Fourthly*, besides self-discovery of other users’ events, Dig-Event recommends you relevant events based on the attribute overlap between titles, types, time and location. Event recommendation typically occurs around one or multiple of these attributes.

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Finally, our system aims to complement existing calendars and social networks, not to replace them. Our design attempts to bring the rich and easy negotiation within a calendar and integrated with user's social networks. The systems we have integrated so far are: Google Calendar, iGoogle Gadgets, Facebook, Twitter, LinkedIn, etc.

The rest of this paper is organized as follows. We first review relevant related work that led to our design. We then describe our system design, emphasizing our design choices and the rationale behind them. Using a usage scenario with screenshots, we describe how people used the system. Finally, we conclude with a discussion of design implications for subsequent versions of Dig-Event and directions for future research.

## 2. MOTIVATION AND RELATED WORK

### 2.1 Event Socialization – Motivation

The social web has changed the way we share and interact with content today. It has moved contents such as photos, videos and bookmarks, from users' devices to online sites [3]. Those uploaded contents, like photos, videos, can be associated to one's life activities.

Most users have had a similar feeling when looking at the photos of their buddies on Facebook: "why I wasn't there?" "I wish I were there!" In [3] authors conducted a research by taking an initial look at the time-based information in the Twitter-like status messages. While most of the time-based information was in reference to what users were doing "now" (i.e. "in a meeting for the next hour"), the authors were encouraged by these initial findings and suspected that users would also be willing to share future plans and events.

A further survey study of status message [5] shows that 9% questions that people asks their social networks are related to invitation of a certain event, like "who wants to go to Navya Lounge this evening?"

The same research [5] has shown that social networking sites like Facebook have seen a substantial usage for event coordination and scheduling.

All of these indicate that there is a need for end-users to share and discovery activities through event socialization.

### 2.2 Event Socialization – Existing solution

There are some commercial portals like Going.com, Upcoming.yahoo.com and Eventful.com focusing on interest-driven/geo-social networking, trying to capture local events, clubs, connecting people with similar interests. These sites are focused on leveraging social networks to help users in finding something to do and meeting like-minded people. Events on these sites typically involve a group of people rather than a single individual, and the events are typically "official" events, comprised of concerts, festivals, sports, arts etc.

R-U-In? [2] takes a step further by enabling on-the-fly community formation around real-time interests and management of ephemeral communities. It creates mashup applications that combine network capabilities with web-based services, in an interesting way: enables the concept of real-time social networking - one can find on-demand like-minded partners who

are potentially interested in a common activity filtered by their current location, availability and interests attributes.

Similar, Plancast.com is a site that allows sharing and socializing around upcoming plans. User can subscribe certain people's event and certain event type. Events are categorized into 9 types: technology, music, startups, sports, film, conferences, holidays, business and parties.

Facebook Events application offers a bulletin-board style approach for soliciting participation in upcoming events.

Hangout is one interesting feature of Google+. Google+ enables live video chat to plan details of an event. Hangouts allows up to ten people to group video chat.

### 2.3 Calendaring

Calendar is considered as a reliable personal time management tool that helps with scheduling, reminding, tracking time and temporal orientation. Early research on electronic calendaring focused mostly on Groupware Calendaring Systems (GCSs) for personal and group time management [3]. Since 1990s, electronic calendars have become more integrated into enterprise and personal information systems, more accessible through mobile devices and more interoperable through standards.

The potential benefits of open calendars have been previously documented by researchers [8][9], however, calendaring systems are mostly static repositories for events [10][11] but do not very well support the dynamics of setting up events including the communication and social aspects of events. Access to electronic calendars is often closed or restricted.

Prior work has studied a novel social microcalendar tool called "Timely?" [3] and its extension version "Suggestions" [4], for enterprise users to share their events and socialize around them. The microblogging concept is leveraged in the design of this enterprise scheduling and coordination tool. A detailed analysis of the events shared by users during the site's first 47 days [3] reveals that users willingly share their time commitments despite an existing culture of restricted calendars.

## 3. DIG-EVENT DESIGN PRINCIPLES

Our research and design extends and applies several of the findings from prior literature and is inspired by the successes of several instances of social networking sites. The Design guides are described as follows:

**Design Principle 1:** Social networking among peers, not strangers. Share and discover day-to-day activities, rather than official events.

Of the many reasons that draw social networking users, the primary one seems to be the ability to communicate with friends, family, and colleagues [2]. While Going.com, Upcoming.yahoo.com, Eventful.com and R-U-In? focus on the geo-social networking and connecting people with similar interests, we believe that the activity sharing and discovery among existing contacts is always the first choice comparing to other unknown contacts. Most people tend to discover the mutual interest of their existing social (highly trusted source).

To this end, our system is designed as a traditional social network typically allows users to solicit participation from known contacts like schoolmates, family, friends and colleagues.

**Design Principle 2:** Event management not restrict to “4W” - *What, When, Where, Who*, but “H”- *How*.

In the evolving landscape, social networking players need to innovate for value-centric usage models that increase customer stickiness [2]. To provide such value-adds, most agree that it is inevitable for online social networks to open up their services for integration with third parties. Technologies like mashups have started to play a pivotal role in these developments, in terms of the ability to consume and integrate data from multiple information sources.

Calendars do support scheduling, i.e. deciding the ‘when’ ‘where’ and ‘who’ of an event. There is limited support to help users to carry out the event. Different from existing activity-based social networking approaches, Dig-Event also conducts “how”, by assisting users to organize the events through mashup their own favorite gadgets.

**Design Principle 3:** Open Access to customized social circle, not “all-or-none”.

Timely? [3] provides a open enterprise calendar by opening a communication channel through two levels of access control: public by default and private. This all-or-nothing access control strategy is likely to deter people who would be willing to share information with only a selective group of people. The interviews carried out in [4] also suggested a finer level of access control, for example, sharing events only with certain social circles, is desired.

Our design was mostly inspired by Google+ social circle. We chose asymmetric sharing model from Google+ instead of reciprocated friendship model like Facebook and asymmetric subscription model like Twitter, so that users could share one-way with people, but they don’t have to share back, thereby reducing the cost of event discoverability.

**Design Principle 4:** Event recommendation over event discovery.

A site with public event sharing has numerous opportunities for making personalized recommendations for discovery. We anticipated that in addition to browsing list views of events, users might spend much of their time viewing individual events. Hence, we decided to add related event recommendations in individual event pages. Event Recommendation Engine considers each activity in three dimensions: (i) event title/type/description (ii) time (iii) location.

**Design Principle 5:** Integration into social networks and calendars, not replacing them.

The Dig-Event design was driven by the desire to push the limits of existing calendars – in particular the value propositions of open-access calendars in earlier research [8][9] – and leverage the success of the social web. We did not seek to replace existing calendar functionality in Dig-Event but rather complement it. Hence, we did not replicate traditional calendar functionality.

Google Calendar is a popular online calendar whose access control and multicalendar overlay features are beyond what standard desktop calendars offer today. It lives in the cloud and can be accessed using the web browser, native calendaring app, mobile phones, blogs and websites, etc. Due to its extensive features for openness, Google Calendar is used to build Dig-Event.

The interviews in [4] suggest that there is a need for a social coordination mechanism that is integrated into people’s calendars and social networks, as well has a lightweight and of less clunky nature. In Dig-Event, events are integrated with existing social networking sites like Facebook and Twitter. This integration allows users to post events to those external services. These posts contain pointers back to the event page in Dig-Event. Note that the gadget mashups on top of the calendar can also be considered as light-weight integration.

## 4. USAGE SCENARIO

The following usage scenario illustrates how Dig-Event can be used:

Fiona is a subscriber of Dig-Event, a social networking site where one can share activities and discover others. Fiona enters Dig-Event home page (Figure 1), she plans to attend an intensive French course, but she does not want to go alone. She decides to use Dig-Event to organize and share this event and see if her friends/colleagues want to join together.

Fiona creates the event “Intensive French course”. She enters the details of the event (title, description, time, place, invited people etc) and shares this event to her own customized group: friend and colleague (Figure 2). The event is published to her personal calendar, the public calendar of her friends and colleagues, as well as the new events (wall). Fiona can also choose to update this event information to existing social networks like twitter. At the same time, an email is sent to her invited friend (Charles Cid) for confirmation.

After the event input from Fiona, the Dig-Event gadget reasoning engine returns to her the gadgets relevant to French course (Figure 3). Gadgets are sorted according to individual sub categories in the left panel and displayed on the right side in an order regarding the gadget rating, user installation number and Fiona’s gadget selection history. Fiona starts to select the precise gadgets of interest. The selected gadgets are mashed up on the Google Calendar (shown as circular green icons on top of the specified event, Figure 4), and can be accessed and used directly. The public calendars of her friends and colleagues are updated with gadgets.

Vincent, who is in Fiona’s friends group, logs on Dig-Event and browses the recent events in his public calendar (Figure 5). He is attracted by Fiona’s French class activity from the “Event recommendation” area. He clicks the event title to see the event details page (Event blog) including a list of attendees with corresponding status like “validated” or “pending”. Vincent follows this event with a simple click. He is able to reuse Fiona’s selected gadgets or choose his own gadgets of interest (Figure 6).

## 5. DIG-EVENT SYSTEM DESIGN

### 5.1 System Framework

Based on the design principles, this section presents a brief overview of the principal components of the system and their functionalities. Figure 7 shows the architecture of the system, which is fundamentally composed of four layers: Presentation, Logic, Data access and Data.

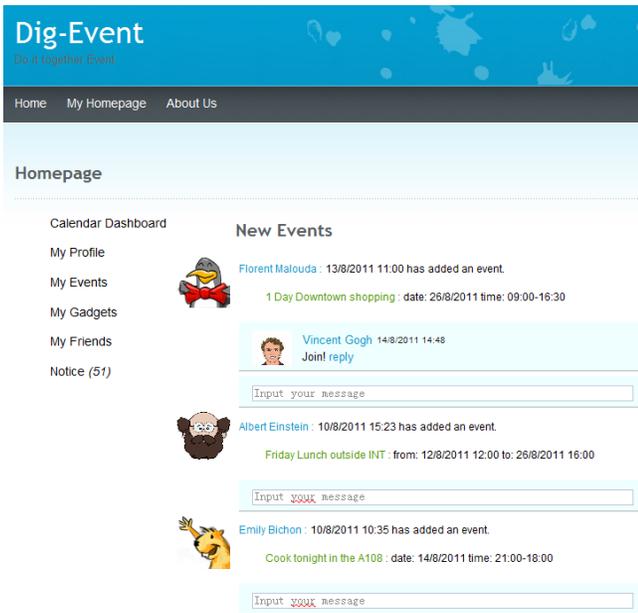


Figure 1. The Dig-Event Home Page showing what's coming up in your network.

Enter an event into your Calendar

Please enter the details of your event below. Required fields are marked with \*

Event title:  [\* This event name will appear in your calendar]

Event type:  [\* Choose one]

Start time:    [\* Required]

End time:    [\* Required]

Publish:  To all  To my categories  To nobody

To my schoolmates  To my colleagues  
 To my relatives  To my friends

Place:

People:  [Enter email addresses, separated by ;]

Description:

Figure 2. User input in event details.

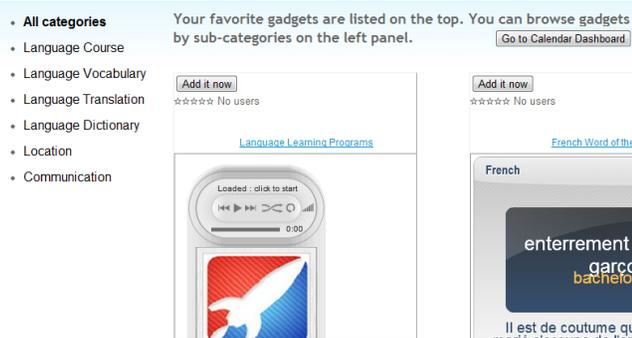


Figure 3. Service recommendation and user selection.

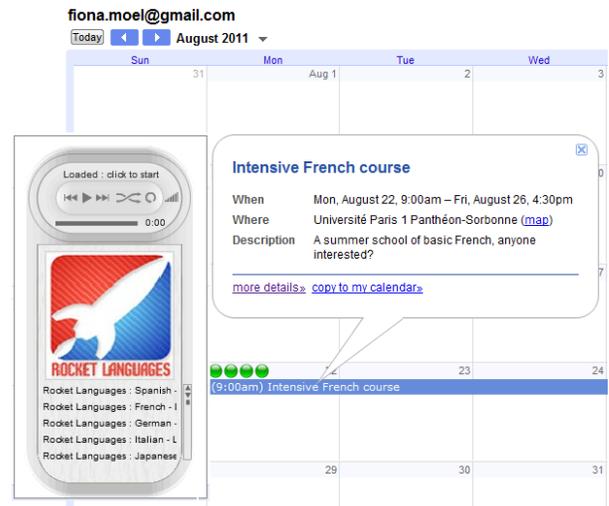


Figure 4. Service mashups on the calendar.

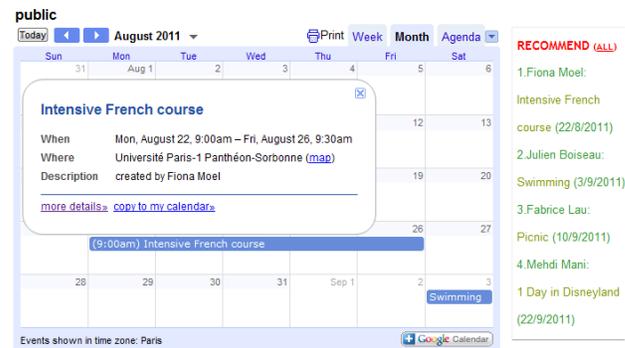


Figure 5. Public calendar and event recommendation.

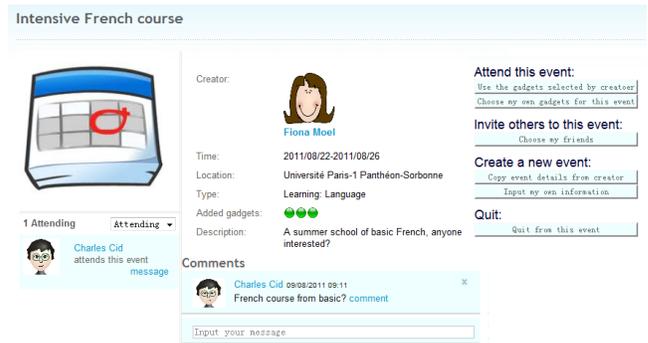


Figure 6. Event blog – page of event details.

## 5.2 Design Details

### 5.2.1 Event Creation

Users create an event by filling in a simple form (see Figure 2), basically providing the following input:

- What's the type of the event you deal with? *What* defines the user's main objective, which is associated with the event type, is the most significant in our system.

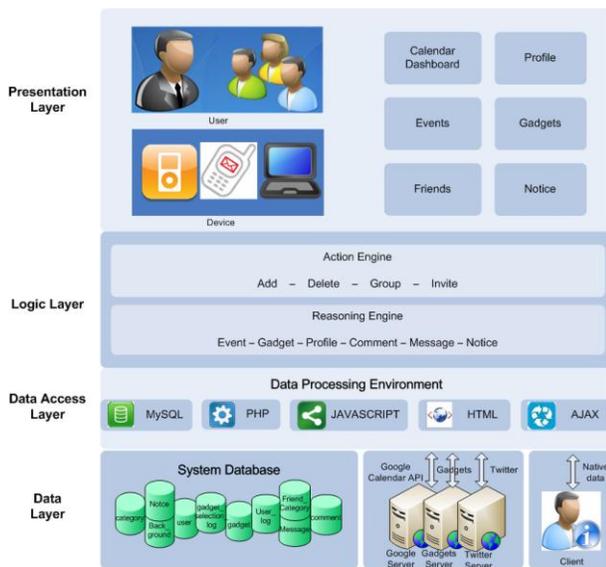


Figure 7. System framework.

- When will the event happen? *When* is functionally related to the time based service and notification service. The functionalities for “*when*”, for example are associated with Google calendar’s functionality of adding reminders/notifications for the event (email, SMS, pop-up).
- Where do you carry out this event? *Where* is associated with location and presence service. The functionalities for “*where*” are based on Google calendar’s functionalities like ‘Google Map’, and also on system-based location/presence functionalities (like driving directions, route planning, weather information etc).
- Who do you want to invite to this event, and to whom do you want to share? *Who* defines whether the event is a personal or a social event, which is associated with communication and social service. The functionalities for “*who*” are based on Google calendar’s functionalities like inviting people, sharing calendars (events and gadgets), and also system-based functionalities like social/communication services. Another question related to “*who*” attribute is Who should be notified about this event. Users have the option to specify people who should be explicitly invited to this event. This sends out email notifications and hence increases the likelihood that someone discovers this event. However, the user can implicitly share this event to own customized social circle.

The Dig-Event system supports sharing events with certain attributes, for example, date and time (when), title and type (what), location (where), participants (who), description etc. Like traditional online calendars, users need to specify at least the “when” and the “what” in order to be able to create an event in the system. Other fields are optional and not required at creation time, but can be added later.

Dig-Event users can broadcast events by posting them to their customized group. Other users will receive these events on their homepage new events wall and public calendar. On this page, users can also leverage existing communication channels, such as Twitter by posting to these services, with references back to the event (Figure 8).



Figure 8. Integration on Twitter.

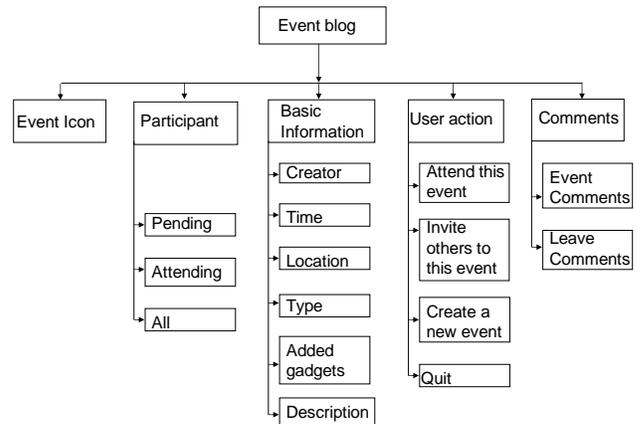


Figure 9. Event blog.

### 5.2.2 Gadget Recommendation and Selection

Creating such an event would trigger gadget reasoning engine to analyze the event input from the user, and further match gadgets in the database. The discovery of appropriate gadgets is done through a hierarchical directory-based-search mechanism, which is illustrated in [6]. The gadgets are sorted according to several rules: 1) based on the event category 2) based on user’s gadget selection history 3) based on gadget rating (star) and user number 4) based on gadgets selected in inherited event.

These gadgets are pooled, and sent to the presentation layer, as service recommendation to the user (Figure 3). Of the recommended services, the user selects the gadgets of interest. The selection of gadgets sends a trigger to record the selection for that user, and update it to the system database. The finalization of service selection triggers the event and gadget reasoning engine to communicate with the Google server, using Google calendar API, to upload the selected gadgets to user’s Google calendar. The Google server sends the uploaded gadgets to the presentation layer for display to the user (Figure 4). The aggregation of selected gadgets creates a mashups application by linking Google calendar with iGoogle gadgets in an effective way. At the same time, the current event and selected gadgets are shared in the public calendar of customized user group (Figure 5), as well as the new events wall.

### 5.2.3 Event socialization

The interaction between the event creator and all the stakeholders is critical to the success of the event scheduling effort. Hence, this interaction must enjoy a high amount of flexibility. For this

purpose, we followed the Facebook design: The user can view events, comments, attending and pending participants.

Sharing events and making them discoverable offers opportunities for communication within or even outside of one's network. In order to support this, similar to other social media sites, Dig-Event provides a page for each event, called "event blog" (see screenshot in Figure 6 and its main functionalities in Figure 9) which captures all the social interaction around it by allowing users to leave comments. In order to socialize around the event, users could do the following actions:

- Comment on this event: Users can be empowered to effectively negotiate around events through comments. Comments are automatically added to the regular comment section of the event. These comments join the rest of the comments directly attached to the event itself (if any).
- Attend this event: User can attend an event by a simply click and is able to reuse creator's selected gadgets or choose his/her own gadgets of interest. In the latter case, during the process of selecting widgets, user can still see creator's gadget selection as reference.
- Invite others to this event: A user can invite others of an event on the site whether he created it or merely found it and knows others who may be interested. This design tightly incorporates the scheduling part of the overall social interaction around an event.
- Create a new event: The interviews in [3] shows that the number one barrier for users to use Timely? is to retype events that they already have in their corporate calendar. In order to avoid this, Dig-Event is designed in which users can copy-paste event from creator, e.g., a conference event one user is going to. If another user wishes to associate herself with this event, she can then simply press the copy button to post it to her own event stream. All the event information is copied from the creator, and user can change the time commitment, location and all other event information easily afterwards.

## 6. CONCLUSION

Social networks of today are yet to fully realize and exploit the domain of collaboration. Research has shown the utility of several different types of social software for activity socialization purposes. The research in this paper was focused on the design and rationale of a novel activity-oriented social network system Dig-Event within an open, social calendar. Dig-Event aims to push the surge of online collaboration from user-generated-content to user-generated-event, by sharing and discovering the activity of mutual interest among social contacts. Using Dig-Event, one can share activities in customized social circles. The system recommends activity-based gadgets from where user can choose gadgets of interest to organize a certain event. The system further recommends relevant events to the user.

We are currently working on some of the shortcomings of our design such as lack of integration with existing calendaring tools. We plan to test the system usability and see what lessons we can learn from the study of the user behavior, such as users' attitudes

towards activity sharing and discovery, if social networking model can be leveraged to satisfy the activity socialization needs, etc.

## 7. ACKNOWLEDGMENTS

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