# GRAFITTER
## *Leveraging Social Media for Self Reflection*

### by Ian Li, Anind Dey, and Jodi Forlizzi

"Know thyself." Carved in stone in front of the Temple of Apollo at Delphi, that was the first thing people saw when they visited the Oracle to find answers. The benefits of knowing oneself are many. It fosters insight, increases self-control, and promotes positive behaviors such as exercise and energy conservation.

One way toward self-knowledge is to collect information about oneself and reflect on it. Benjamin Franklin understood this when he recorded whether he achieved one of his 13 virtues every day for 50 years. Today, people track their personal information using a new class of applications and Web sites called personal informatics systems.

Personal informatics systems can automatically collect all kinds of information, from financial transactions (**Mint.com**) to computer usage (**Slifelabs.com**). However, some personal information cannot be reliably detected automatically, requiring users to collect it manually, observing themselves and recording their behavior or reactions on paper or a Web form.

In addition to requiring more attention and time, there are three main issues with manual data collection. First, the input device may not be accessible. If the user records data on a spreadsheet, she can only record it when she is at her computer. People use paper because of its portability and ease of use, but it introduces a second issue: transcription. People eventually have to transfer their data from paper to a graphing tool. The third issue is that most personal informatics systems focus on only one type of data.

### Designing Personal Data–Collection Tools

In light of these issues, we think a successful manual collection tool for personal informatics should include the following features:

1) support for recording with various inputs in multiple contexts,

2) easy integration of collected information into the reflection tool, and

3) flexibility in supporting various types of information.

We designed and built a system called Grafitter that exhibits the above three features. First, Grafitter leverages various social media to allow recording various inputs in multiple contexts. Second, Grafitter automatically aggregates data from these various inputs into one tool for reflection. Lastly, Grafitter allows people to record various types of information with a format that is easy to remember and can be written quickly.

### Grafitter in Context

To better explain how the system works, it helps to use example scenarios in which Grafitter could be used.

Samantha is a college student and an avid Twitter user. She has been using Twitter for four months and sends an average of 15 Twitter updates, or tweets, per day, similar to other active users. Her tweets usually are about what she does at school and at home. Samantha recently learned about Grafitter and decides to record her daily moods, how busy she is, and her weekly goals.

In the following scenarios, Grafitter allows Samantha to collect personal information with the medium that is immediately at hand.

Sitting next to a window in class, Samantha notices that the trees are starting to grow leaves after a long winter. She updates her Twitter account using her mobile phone to alert her friends: "A good sign: new leaves are sprouting! #mood(optimistic, warm)."

On a busy Thursday afternoon in the library, Samantha asks a friend a quick question via an instant messaging program. Samantha sees the Grafitter IM bot (**grafitter@bot.im** on Jabber and **grafitterbot@aim.com** on AOL Instant Messenger) on her buddy list and also sends it a message about how busy she is: "#busy(5) Making progress on my lab study, but forgot my phone." The IM bot saves her record for later viewing.

While studying for an exam before spring break, Samantha finds an interesting Web page on leatherback turtles. She bookmarks the page on Delicious with the note: "Have to save the turtles! #goal(conserve water)."

After two weeks of using the Grafitter format while tweeting, instant messaging, and sharing on Delicious, Samantha is curious to explore the trends in her mood and how busy she is. She visits Grafitter.com and enters her Twitter name on the site's top navigation bar, which takes her to a page where she can view graphs of the data she recorded on her Twitter account. She can also enter her Delicious username or IM screen name to reflect on the data she recorded from those two services. In all instances, Grafitter pulls the data from the appropriate sources and prepares them for visualization.

Samantha can record various types of information using the Grafitter format. In the above examples, she recorded her mood, busyness, and goals. She chose the labels, #mood, #busy, and #goal, respectively, to represent these types of information. Grafitter did not constrain her on a particular type of information and she was free to choose the labels that were most meaningful to her.

### The Grafitter Format

The format is inspired by and builds upon Twitter hashtags, or words prefixed with a the symbol #. Hashtags is a convention that the Twitter users' community developed to indicate metadata. For example, a tweet describing a presentation at the CHI 2008 conference might read, "Just saw an interesting study on Wikipedia. #chi2008."

In the Grafitter format, the hashtag serves as the variable name. Within the parentheses that follow the hashtag is the value of record. Values can be numeric, textual, or a list of values separated by commas.

Here are examples of messages in the Grafitter format:

- #mood(happy) Just had ice cream.

- A long day #work(11) And it's not even done yet.

- Relaxing lunch with friends. #lunch(amy, bob, jim)

The Grafitter format is designed to be distinct and easy to input. First, the format is distinct enough to simplify parsing of the data. Since there is no central server (the Grafitter format can be embedded in Twitter, blogs, sharing Web sites, and so on), there is no preprocessing of the data to prepare it for visualization. Instead, parsing is done client-side, thus parsing has to be efficient.

The second consideration is that since users might use the format several times a day over several days and weeks, it must be easy to enter. We leverage Twitter hashtags because many people already use them.

While there are three main avenues for reporting personal behavioral information to Grafitter, the format can be supported in other social media, too.

## Twitter

Users can use the Grafitter format while sending messages with Twitter. Since Twitter supports SMS (Short Message Service) and there are Twitter clients for mobile devices and desktop computers, users can enter their personal behavioral information using the Grafitter format using multiple devices. When users are ready to see visualizations of the data they have collected, they can go to **http://grafitter.com/tw/***twitter_name*. The Grafitter site gets the data from Twitter using the Twitter API.

## Embedding Data While Sharing

We use Delicious as an example of embedding data while sharing because it has a robust API for accessing data and plenty of users. When sharing a bookmark on Delicious, users can enter Grafitter-formatted information in the "Notes" field of the Delicious form. We use the "Notes" field to preserve the title of the bookmarked page in the "Title" field and to avoid cluttering the users' set of Delicious tags. Since Delicious tags are space-separated, entering a valid Grafitter format such as "#mood(very happy)" into the "Tags" field will be parsed by Delicious as two unseemly tags "#mood(very" and "happy)". Visualizations of Grafitter-formatted data on Delicious are seen at **http://grafitter.com/dl/***delicious_name*.

## Instant Messaging Bot

We also created an instant messaging bot to which users can send Grafitter-formatted messages. The bot can be reached at **grafitter@bot.im** using any Jabber-enabled client, such as iChat and Google Talk. An IM bot on the AIM network can also be reached at **grafitterbot@aim.com**. The IM bot is built using the IMified service (**imified.com**), which runs bots on several IM networks, such Jabber/ GTalk, AIM, Yahoo!, and MSN. The messages received by the bot are sent to the Grafitter site, which stores the messages. Users can access graphs of their messages using their instant messaging screen name at **http://grafitter.com/im/***screen_name*.

On the path to greater self knowledge, Grafitter makes it easy to report daily personal behavioral information by connecting with various social media in different contexts. The tool automatically culls data from these sources so that users may reflect on visualizations of their collected behavioral information, and perhaps get to "know thyself" just a little better.

## Biographies

*Ian Li (***ianli@cmu.edu***) is a PhD student in the Human-Computer Interaction Institute at Carnegie Mellon University. His research interests are in ubiquitous computing, visualizations, interaction design, and social web. He has combined these interests to develop personal informatics systems that help people gain self-knowledge by collecting and reflecting on information about themselves.*

*Anind Dey (***anind@cs.cmu.edu***) is a professor in the Human-Computer Interaction Institute at Carnegie Mellon University, where he recently started directing the HCII PhD program. His research interests lie at the intersection of human-computer interaction and ubiquitous computing, focusing on how to make novel technologies more usable and useful. In particular, he builds tools that make it easier to build useful ubiquitous computing applications and supporting end users in controlling their ubiquitous computing systems.*

*Jodi Forlizzi (***forlizzi@cs.cmu.edu***) is a professor in the Human-Computer Interaction Institute at Carnegie Mellon University. She is an interaction designer contributing to design theory and practice. Her theoretical research examines theories of experience and emotion as they relate to interaction design. Her other research and practice centers on notification systems ranging from peripheral displays to social robots, with a special focus on the social aspects of these systems.*



**GRAFITTER** BETA

Twitter | IM | Delicious | Blogger // [Enter Twitter name] [Show]

# Hello!

### 1. Know yourself?
Grafitter is a personal informatics tool for collecting and exploring information about your habits and patterns.

### 2. Collect data.
Use the Grafitter format on Twitter, IM, Delicious, and Blogger to collect data about yourself easily and quickly.

### 3. Visualize.
Explore and find trends and patterns in your data using visualizations. Just type in your username on the top blue bar.