A Conversational Model to Display User Activity

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ABSTRACT
The creation of mechanisms to motivate user participation became a necessary strategy for evolution and sustainability of many online systems. Nowadays, most of these mechanisms are based on a form of displaying user activity, e.g. through badges or ranking scores. In this paper we discuss the current use of activity displays as incentives for user participation, and present the IntroText, an alternative conversational approach. Based on the metaphor of introducing someone, the IntroText sketches a behavioral portrait of users in a very individual and non-competitive way. We describe the implementation of this interface feature pointing out to its potential to influence online behavior.

Categories and Subject Descriptors
H.5.3 [Information Interfaces and Presentation]: Group and Organization Interfaces

General Terms
Human Factors, Interface Design

Keywords
Social software, incentive, user activity, tracking

1. INTRODUCTION
Nowadays, concepts of “Architecture of Participation” [20] and online communities are widespread. Systems are designed to encourage and, at the same time, profit from users’ participation. Online communities can be very helpful in this task: their members generate content, attract other users, and are likely to frequently return to the website. The creation of a stable community, however, is not a simple task. In order to hold the community together, creating a website that allows users to register and contribute is not enough. Facing high competition, systems started to create a whole bunch of mechanisms in order to get users involved in their causes. Studying the reasons behind users’ engagement, researchers soon realized that contributions can be most of the times considered as a way members have to get noticed within the community [14, 9], or as a byproduct of members’ communication [20]. Thus, the display of users activity became one common way of stimulating user participation.

Display of users’ activity can take many forms. A clear difference can be noticed between systems whose communities are formed around a theme (news, recipes, books, etc.) and systems whose argument is the social network itself, e.g. [2, 3]. While the second tends to directly display single activities and updates within a social group inciting other to perform the same actions, the first tends to translate activities into a sort of ranking code, such as a point system, resulting in an explicit stratification where some users fill leadership roles and others do not.

Ranking users based on their activities is a good method to promote high active user within a community, but to stimulate participation in the community as a whole, it might be questionable. As in any system where many people can freely choose from a variety of options, ranking activity in online communities follows a power law [8, 20]. In online systems, it has been shown, for example, that few contributors produce most of the content in wikipedia [21], and few blogs attract the great majority of readers [22]. Thus, it can be concluded that very few users will reach top levels of contributions. In this case, showing activity levels in a hierarchical way - expecting that most of the community will struggle to evolve in the established social hierarchy - can be a recipe for disappointment. Furthermore, even if all users take the challenge of evolving in this hierarchy, they are likely to give up after a certain time.

In this paper we discuss ways of displaying user participation (Section 2), and present the IntroText (Section 3), an activity display designed to enhance participation within a community of interest in the architectural domain. The interface feature builds on the social practices of status updating and aims to be an alternative for ranking models. Its implementation not only encourages further studies (Section 5) but also raises issues related to privacy and non-intentional creation of user related metadata (Section 4).

2. OVERVIEW AND RELATED WORK
Psychology studies [17] have shown that motivations to contribute to online communities can spring from a variety
of sources: from the expectation of reciprocity, to a sense of efficacy, or the sustainment of one’s reputation. Since all these factors are related to the visibility of contributions within the community, putting contributions in evidence and tying them to their authors are essential for any incentive mechanism. Though the ways of displaying user activity depend on the community, the architecture and the information presented by each system, some patterns and tendencies can be recognized.

2.1 Ranking user activity

In communities formed around a theme the most common activity displays correspond to ranking systems\(^1\), which intend to: 1) reward active users, 2) establish activity paradigms, and/or 3) allow users to track their own actions within the established model. Such mechanisms track the amount of contributions of each user (e.g. number of posts, comments, replies, etc.) and/or allow other users to rate contributions (by giving stars, classifying as good or bad, etc.). The scores are translated into positions of a ranking scheme - automatically granting users a hierarchical profile. In this case, users are motivated to contribute in order to reach the next higher profile in the hierarchy, or to shape their behavior according to what they consider as a good paradigm.

This approach, however, presents an intrinsic contradiction. Nowadays, it is known that power law distributions tend to arise in any social system where many people express preferences among many options \([8, 15]\). In such distributions the value for the Nth position will be \(1/N\), which means that the value of second place will be half of the first place, and tenth place will be one-tenth of the first place. It is also known that increasing the size of the system, also increases the gap between the first and the median place. In this sense, if profiles are defined by ranking they will be consequently governed by a power law: very few users will occupy the highest activity profiles, while the great majority might end up struggling to reach leadership roles without success. Thus, such approach can improve activity during a certain time, but is likely to bring discontentment or be ignored after a certain period.

If users take too long to evolve in the pre-defined hierarchy, they are likely to give up before making any evolution. One way of dealing with this problem, presented by Farzan et al.\([11]\), is to establish different median roles so that users contributing a bit would already realize their evolution and keep stimulated to follow the next step in the median hierarchy, even though they may never reach the highest levels of contributions. Furthermore, if parameters to classify high contributors are lowered, there is the risk of discouraging high contributors \([19]\).

2.2 Kinds of user activities

Another common way of displaying user activity is to award badges or titles that represent the nature of users’ activity, e.g. in \([4]\). Such mechanism requires contributions to happen in different ways (e.g. tagging, commenting, etc.). The clear definition of profiles, based on these actions, leads users to recognize each other within the community, motivating them to pursue and assume one of these profiles. In this approach the desired profile might be easily reached.

However, if the activities, and consequently the roles, are not varied enough, the badges might not be enough to characterize users within the community and other ways of coping with their necessity of personalization might be necessary. Incentive mechanisms are effective as long as they allow users to identify others and position themselves according to the created social systems. In this sense, the personalization of profiles is crucial. Since in the digital world people cannot count on social signs we unconsciously follow in the physical world, it is necessary to develop systems that provide cues about the presence and activity of users \([7, 13, 10]\).

2.3 Activity status

Another way of stimulating participation is to divulge the activities of each user within a certain group to which he/she belongs. Facebook, for instance, openly reports the last activities of users to their friends through status messages. In this system, for instance, a user A is informed that a friend B became friend of a user C, which is consequently a potential friend of A, or the same user A is informed that the friend B has tested a new Facebook application, which might therefore be an interesting suggestion for A. In this case the fact that friends have carried out a certain action is likely to inspire users to perform the same activity, encouraging participation.

Another tendency is to allow users to post mood messages, where users publish what they are doing, or how they feel at a specific moment, to members of their social groups. These messages are a way to indirectly keep in contact with friends while personalizing one’s profile. They are the basis of instant microblogging systems, such as Twitter \([5]\), and a characteristic of new ways of communication. By analyzing communities of Twitter users, for example, Java et al.\([16]\) found out that the largest and most common use of twitter is to talk about daily routine or current actions. The second is to establish public conversations, using the symbol @ to address a person.

This approach, however, is hardly adaptable to non-social network systems. Firstly, it demands users to have a group of acquaintances - among which updates would be exchanged. Secondly, for the automatic update, the system must offer a variety of activities or each activity must allow enough variation to generate novel updates. Finally the mood messages may disturb or not be understood by those that are not close friends.

3. INTROTEXT

Based on the previous analysis we developed the IntroText, an interface feature to improve users’ participation in the MACE (Metadata for Architectural Contents in Europe) platform. The platform is an interface for accessing resources from different European repositories via metadata in the thematic area of Architecture. It not only supports retrieval and connection of contents from different repositories, but also enables the addition of new resources and metadata. The range of users’ contributions in MACE is wide, including tagging, commenting, rating, adding content location, specifying field competence, as well as adding content from external sources. Besides viewing, any action carried out over a resource consequently links this resource to the user page - so that this resource will stay available as a bookmark on the user page.

At the moment, the MACE community consists of about...
150 registered users, one third of which is composed by technology researchers directly or indirectly working in the European project. The other two thirds consist of users related to the architectural target group, whereby the majority are students. Their contribution is crucial, not only to maintain the system, but also to attract other users and repositories.

As part of a research project, the platform is a place to try different strategies for metadata creation and community studies. For this reason, users can agree with the tracking of their actions in the system when they register. Tracking users’ actions is a common practice in systems that have a sort of mechanisms to reward participation. The data gathered by tracking users’ actions in MACE is the basis for the IntroText.

Building on the metaphor of “introducing” somebody, the IntroText aims to boost activity through a conversational and non-hierarchical model. In the real world, when an individual enter the presence of others, they seek to acquire information about him/her or to bring into play information about him/her already possessed. The ritual of introducing someone is a way of offering a starting point for this investigation.

In the online world the scenario is similar, by visiting a profile page users look for information that can facilitate introducing someone is a way of offering a starting point for this investigation.

In order to build the IntroText, data regarding day of last action (d), number of visits (n), number of days from registering until day of last action (t), number of tagged contents, number of rated contents, number of days passed since last action (dp), most frequent searched repository, visit frequency (n/t), number of visits/number of tagged contents (n/tg) and number of visits/number of rated contents (n/rt) are analyzed and used to define introductory sentences regarding three temporal levels: long-term, middle-term and last visit behaviors.

In the long-term level, general behavior of the users are defined based on their visit frequencies (active time/time since registered) and time passed since last action. This data is interrelated and transformed in phrases such as: “eventually shows up”, “is on vacation”, “is a continuous loyal visitor”, “had fun for a day”, etc. If recurrent actions are recognized, they are added to the phrase as favorite occupations. For instance, if the main action is tagging, the system prints the expression “who has made valuable contributions to the organization of contents”. If adding new resources is the main action, it prints “who spends most of the time contributing new resources”, and so on.

For the outline of mid term and last visit behavior, IntroText analyzes action sequences such as entered search term, number of results viewed, time spent throughout the search, and the action performed on a viewed content (tagging, commenting, viewing). These action are translated into sentences that suggest the theme in which the user is currently involved, e.g. “Lately user name hastily browsed classification terms”, “Quite a while ago, user name briefly labeled tagged resource with given tag”, “Last time here, user name quickly found checked resource while searching for searched term” (see Figure 2 for more examples).

Each temporal level presents a different set of possible sentences. Though they are likely to be expanded in the future, at the moment, the long term behavior level includes two group of sentences: one offering 25 and the other 15 phrases possibilities, the mid term level counts with three groups of 5 possibilities and the last visit level has three groups of 2, 4 and 6 possibilities. The combination of such sentences allows for 225000 different profiles descriptions. We also dedicated special attention to the definition of sentences for low levels of activity. From the figures above 450000 sentences correspond to very low levels of activity. Furthermore, the variety of sentences is actually even higher, since the middle term and last visit descriptions include the display of tagged and/or searched terms as well as viewed resources, which are likely to vary from one user to another, even if they have the same sentence structure.

Activity is stimulated in order to communicate with others. By visiting one’s profile it is possible to know the themes in which this user has been recently and/or constantly interested, and it is possible to realize how long he/she has been involved with such themes. The general description based on the long-term analysis gives a hint to the amount and kind of resources that can be found in the profile page of each user. Adjectives, like hasty, intensely or cautious are used to form a perception of the momentary mood of the user. Latest search terms, ratings, comments, tags or added resources inform about user’s research topics, the way they performs research or the preferred actions and contents. IntroText also informs about the given possibilities to handle research with the help of MACE tools. It inspires curiosity.

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2MACE is a research project, founded by the European Union over the eContentplus programme, to interconnect and disseminate digital information about architecture over Europe.
without being frustrating, because no goals or competition levels have to be achieved.

Though MACE only includes academic and educational content, we understand that the divulgation of metadata produced by users in a non-intentional way (such as most performed actions and most entered searched terms) could change search behaviors or lead to a feeling of privacy violation. Allowing users to deactivate default features also don’t help much, since it is known that most users don’t change the default definitions when registering to a system. In order to better understand the effects of the divulgation of such data we carried out a questionnaire with the MACE users a short period after its implementation, as presented in the next section.

It is interesting to remark that the tension between privacy and visibility assumes a crucial role here. It is known that what people say and do with another person depends on who, and how many, are watching [10]. Because students access the website influenced by professors, once their searches are made public, they are likely to focus searches on themes considered as valuable within the community. The divulgation of non-intentional metadata, however, is not an innovation, other systems are fully based on it [1], and some even claim it to be able to define more reliable user profiles [?].

4. INTROTEXT IMPLEMENTATION

The IntroText has been implemented on the 29th of January 2009, as the first step of a wider community experiment. During the first month of implementation some changes in the tracked data could be already perceived (see Figure 3).

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3 A study about privacy in online networks, for example, found out that more than 99% of the Twitter users retained the default privacy settings upon their profiles [18].

4 Activity of MACE users started to be tracked one month after the portal has been launched on September 2008, and...
At the time the IntroText was launched, the viability and contacting users and an enhanced access to users’ profile pages. However, additional community features must be improved refined in an iterative process. In order to improve results, suitability of many features were under study, being not yet implemented, such as an adaptive interface that presents users with activity profile that match the activity of the logged user, or the possibility of automatically receiving updates of previously defined users’ activities.

5. FUTURE WORK

In the near future the IntroText will be monitored and refined in an iterative process. In order to improve results, however, additional community features must be improved or implemented in the MACE portal, such as ways of contacting users and an enhanced access to users’ profile pages. At the time the IntroText was launched, the viability and about 3 months before the implementation of the IntroText

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7. REFERENCES


Figure 4: Results of the survey carried out with MACE users, green represents positive answers, red and orange negative ones.

3). For instance, a slight increase in the visits of users profile was identified. We assume that, as the IntroText is continuously changing, users return to the system to not only check profiles of other users, but also to check for updates in their own profile pages. Additionally, a slight increase of activity in general (regarding page views, actions and searches) could be observed which might be caused by users trying out different ways of shaping their introductions.

As mentioned, in order to evaluate users’ concerns upon privacy issues involved in the divulgation of metadata produced in a non-intentional ways, 3 weeks after the implementation of the IntroText, we carried out a questionnaire composed by three multiple questions. The first question asked about their general impression over the new feature, offering the options: a) is great, I enjoyed it / b) is somehow funny / c) has nothing to do with me on MACE / d) bothers me a bit / e) is insulting. The second and third questions asked how they felt about the possibility of having others seeing their most performed actions (tagging, commenting, etc.) and their most entered searched terms on MACE, both questions presented the same alternatives for answering: a) I’m glad to share / b) I even enjoy it / c) I don’t mind / d) It eventually bothers me / e) I don’t like it / f) Other... (please tell me). The questionnaire was sent to all registered users, 24 answers returned and are illustrated on the graph of Figure 4.

Results from this preliminary survey were mostly positive. 87.5% of users evaluated the feature as great or amusing, only 16.6% did not support the communication of their most performed actions (tagging, commenting, etc.), and 29.2% disapproved the display of their entered search terms. These figures show the general acceptance of the system by MACE users.


