ABSTRACT
This article discusses the relation between interface affordances and social interaction practices in online communication systems (OCS). The underlying premise is that social, cultural and cognitive elements are as important as structural, functional and aesthetic features in the development of technology adoption patterns. This hypothesis was examined through a comparative study of the preferred modes of interaction of a sample of users of two OCS that follow the 'microblogging' model (Twitter and Plurk) and instant messengers (MSN, Gtalk and/or Skype). Users responded to an online questionnaire and an in-depth interview. Each user also provided us with images of their screens during typical interaction sessions using the above OCS on desktop and mobile devices. The results led to the proposal of a categorization of socio-technical affordances and confirmed the mutual influence between online conversational practices and interface affordances. Moreover, the adoption of a socially-situated perspective has proven essential for the analysis of user-system interaction, as well as interpersonal interaction, using both mobile and fixed internet access.

Categories and Subject Descriptors
H. Information Systems; H.5 INFORMATION INTERFACES AND PRESENTATION; H.5.2 User Interfaces

General Terms
Design, Human Factors, Theory, Verification.

Keywords
Affordances; social practices; interpersonal communication.

1. INTRODUCTION
The notion of affordance was first introduced by Gibson [11]. The author's affiliation with the idea of ecological psychology is imprinted in one of the most promising aspects of the original idea of affordance. In Gibson, an affordance "cuts across dichotomies" and "implies the complementarity of the animal and the environment". This understanding that affordances are "equally a fact of the environment and a fact of behaviour" is one of the most promising aspects of the original proposal, as it places the influence of affordances at the intersection between the animal and its surroundings. Unfortunately, this perspective was lost when the concept of affordance was imported into HCI.

2. AFFORDANCES
The concept of affordance has been widely used – and heavily criticized – in the realm of HCI. This section reviews some aspects of the idea of affordances in HCI, highlighting specific points important to our study.

In Gibson’s original notion, affordances are essentially properties of the environment, but they are relative to the behaviour of a specific animal. Their existence is independent of the animal’s ability to perceive them, leading to an understanding of affordances as objective action possibilities. However, Gibson stressed that “actually, an affordance is neither an objective property nor a subjective property” and that “it points both ways, to the environment and to the observer”[11].

The perception of affordances occupies a more central position in Norman’s application of Gibson’s idea to design [17]. For Norman, affordances refer to the actual and perceived properties of an object, but the latter are much more important for design. Perceived affordances are the ones which effectively define the ways in which something can be used. In a later piece, Norman minimizes the importance of the notion of affordance for GUIs [18]. His reasoning is that the basic affordance of screens is that they can be touched, or a representation of an input device (usually a mouse) can be made to indicate that a specific pixel - or set of pixels – can be symbolically ‘activated’. Thus, icons on the screen are not visual affordances, they simply call attention to the fact that certain actions are possible.

We believe that this idea that visual elements in GUIs are not affordances per se, but induce the perception of some affordances, while hiding others, does not compromise the applicability of the notion of affordance in HCI. Our position is akin to Hartson's, who elaborated Norman's distinction between real and perceived affordances, identifying real with physical affordances and perceived with cognitive affordances [13]. Hartson defined cognitive affordance as “a design feature that helps, aids, supports, facilitates, or enables thinking and/or knowing about something”. This understanding of the cognitive role of affordances is very important for HCI. It points to a specific view of the relationship between interface designers and system users: one in which interfaces are designed to inform the users as to how to use the system. This is done by choosing and distributing cognitive affordances on interface spaces, recognizing the influence of affordances at the intersection between the animal and its surroundings. Unfortunately, this perspective was lost when the concept of affordance was imported into HCI.
efficiently informs the users how to interact with the interface in order to make the best of the system's possibilities.

This deterministic approach, in which the designer 'knows' what the user needs and informs him of the 'best ways' to achieve his goals persists also in some well-intentioned user-centered and user experience design practices. Ethnographic and participatory initiatives at times are not sufficient to prevent the confusion between the mental model of the user and the mental model of the designer about the user. Thus, interface design remains driven by the designer's idea about what the user needs and wants or about what he considers a desirable or pleasant HCI experience.

The role of cognitive affordances is therefore understood as telling the user "what actions can be performed on an object and, to some extent, how to do them" [17]. By trying to give maximum visibility to the interface affordances 'that matter', designers tend to focus on the interface itself rather than on the relation between user and interface.

However, in Gibson's original view, affordances are reciprocal relations between the environment and the animal. As such, "affordances are primarily facts about action and interaction, not perception." [11]. In the context of interpersonal communication systems, this perception calls for a differentiation between interaction with technologies and interaction with other individuals. This difference points to the importance of cultural and cognitive variations in the perception of affordances, as well as the influence of social characteristics of a given group as facilitators of certain modes of interaction. The combination of these influences converge in Vatrapu's notion of socio-technical affordances: "action-taking possibilities and meaning-making opportunities in an actor-environment system bounded by the cultural-cognitive competencies of the actor and the technical capabilities of the environment" [20].

This notion of socio-technical affordances goes against previous authors' claims that affordances do not belong to the socio-cultural world [10]. Nevertheless, we extend the proposition by claiming that socio-cultural configurations are closely intertwined with affordances. Thus, in our understanding, affordances are simultaneously related to the interface, to the user and to interaction contexts. Underlying this proposition is the claim that technology and society cannot be understood independently. On the one hand, any technological artefact reflects the socio-cultural, economic, political environment that motivated and supported its creation. On the other, the insertion of every new technology changes society. In other words, technology is a socio-cultural configuration and, at the same time, "society cannot be understood or represented without its technological tools" [4].

One of the most interesting results of the recognition of this interplay between technology and socio-cultural environments is the identification of the active role of the user in the definition of the meanings and uses of technology. Users do not simply take advantage of interface affordances: they play an active role in shaping those affordances.

3. SOCIAL PRACTICES

Our study targets the relation between interface affordances and social interaction in online communication systems. We believe that interface design can direct the user to specific modes of interaction with the system, but cannot prevent other possible modes being used.

People don't use technologies as they are expected to: they modify, adapt and even subvert technological features according to their needs or desires. This active and creative relationship between users and technologies goes against the previously described deterministic tradition in HCI. According to that line of interface design, interface affordances must inform users about the most efficient and effective ways to interact with a system. This assumption encompasses several others, starting with the belief that there is a correct (or, at least, a best) way of using software. The second inherent presumption is that designers know which way is that. Third, that good design is capable of directing the user towards it, ruling out other possibilities. Together, this set of beliefs implies that interface design can – and must – define the interactions between users and software.

During the last decade, the idea of active users modifying technologies according to their desires and convenience has become more popular in the field of HCI. The valorisation of customization, adaptation and re-appropriation of technologies by users can be seen in proposals such as Design for Appropriation [6], Design for Hackability [9] and Design for Serendipity [16]. This redefinition of the relation between designers and users restores the equilibrium between the technical and social foci of HCI research. Social approaches help overcome the limitations of deterministic design by focusing on the social forces that give rise to particular ways of interacting with technology, transforming the technological configurations that, in turn, feedback into society, closing the circle. This view is primarily inspired by Berger & Luckmann's notion of 'social construction of reality', according to which human reality is a social construct, built upon the institutionalization of shared beliefs about the external world [2]. As technology is part of social reality, the same reasoning applies equally to technological artefacts.

Recognising the importance of socio-cultural – and cognitive – forces for HCI does not imply a denial of the role of structural, functional and aesthetic features of technologies in shaping human interaction. It is a fact that interface affordances emphasize certain features while shadowing others and, in this process, inscribe preferred forms of use and even limit the range of possible user appropriations. However, whilst directing and constraining human-interface interaction, design cannot fully prevent the user from interacting with the system in unexpected ways. The way in which a technology is deployed is also determined by its users: this use is not inevitable, built into the technology, or fixed [15].

4. AFFORDANCES AND SOCIAL PRACTICES

The active role of the user feeds back into our original proposition that interface affordances help in shaping social practices, denoting a set of mutual influences. This perception calls for a more refined examination of affordances as socially situated technological features.

As previously mentioned, Norman's initial application of the concept to design implied a distinction between two basic types of affordance: real affordances (those that indicate actions that are effectively possible) and perceived affordances (those that the user perceives to be possible) [17]. Gaver [10] proposed a categorization that relates affordances to the perceptual information about them. Binary combinations (affordances exist or not, are perceptible or not) resulted in 4 categories, namely: perceptible, hidden and false affordances and correct rejections. Perceptible affordances are real affordances about which perceptual information is available (they exist and they are
directly noticeable). Hidden affordances are real, but cannot be directly perceived (their existence has to be inferred). False affordances are not real, in the sense that they do not correspond to a real possibility of action, but perceptual information suggests they do. Finally, correct rejections are affordances that do not exist and there is no perceptual information suggesting that they do.

Harton [13] has developed Norman's distinction between real and perceived affordances into a different set of four categories: physical, sensory, cognitive and functional. Physical affordances comply with Norman's strict definition of real affordances as material properties that allow for certain modes of bodily interaction. Hartson believes that the idea of perceived (or perceptible) affordances should be divided in two more specific categories. One is sensory affordances, that relate to the reception of sensory inputs (seeing or hearing, for example) but not to interpretation of this information. A cognitive affordance, on the other hand, "helps, aids, supports, facilitates, or enables thinking and/or knowing about something" [13]. Roughly, sensory affordances are about perception and cognitive affordances about understanding. This distinction is important at the conceptual level, but poses a great empirical challenge. Hartson's fourth category, functional affordances, are about the purpose and the usefulness of application features: they extend beyond the limits of interface design to higher levels of interaction and system.

Kreijns e Kirschner [14] define social affordances as social-contextual properties "that facilitate the triggering of a communication episode". These are particularly important in studies of conversational and collaborative systems. We consider it relevant to differentiate between socio-technical affordances that emphasize the interaction between user and system and those that relate more directly to the interaction between users. We refer to the former as interactivity affordances and to the latter as interaction affordances. Both encompass the various types of affordances discussed up to this point and facilitate certain types of social interaction while making others more difficult.

In the context of an investigation of voice and text communication with mobile phones, Fraser and Reid [8] addressed two types of socio-technical affordances: expressive control and conversational involvement. Expressive control affordances are related to the conscious control of the elements involved in the presentation of oneself to others during social interaction, as described by [12]. This is relevant to this research as (a) presentation of the self in inherent to interpersonal interaction, mediated or not; (b) presentation of the self is particularly explicit in online communication systems, in the construction of profiles and choices of usernames and avatars. Conversational involvement affordances involve the addressability of messages, the speed of message transmission and the portability of the support device.

Two other features of socio-technical interactions mentioned by Kreijns e Kirschner are group awareness and commonality [14]. Group awareness relates to the perception of other individuals with whom it is possible to interact. Commonality refers to the shared elements that contextualize group awareness. Group awareness "is limited to those engaged in the underlying commonality", but the "use of more than one commonality allows different kinds of concurrent group awareness" [14].

5. METHODOLOGY

Our study of the relation between interface affordances, uses and appropriations targeted two types of online interpersonal communication system: microblogging tools and instant messengers (IMs). Twitter was an obvious choice of microblogging tool, given the importance of appropriations throughout its history. Twitter was launched in 2006, with a leading question (what are you doing?) that suggested that it had been designed as a tool for sharing personal information. Its fast popularity growth was accompanied by the development of a large range of other practices, such as synchronic conversation, news dissemination and crowd sourcing information sharing. This diversification called attention of other social actors, such as businesses, newsgroups and media celebrities, who joined Twitter as a professional platform [1, 7]. Twitter's history also includes user's inventions of functionalities that have been later incorporated by the platform. The most prominent example is the 'retweet', i.e., the reproduction of someone else's message (tweet), preceded by RT and the username of the person responsible for the original post (RT @username)[3, 19].

A second microblogging service was included with the intention of maximizing our chance of encountering and of having the capability to analyse different types of social practices in OCSs. Twitter's success motivated the creation of several other microblogging systems, most of them with functionalities and interfaces very similar to Twitter's (identi.ca; Jaiiku, Quikku, Sina, etc.). At the time of writing, a few remain active and hold a reasonable amount of users (for example, Jaiiku, Sina). Amongst the microblogging services with interfaces remarkably different from Twitter, we chose to focus on Plurk. One of the advantages of Plurk is that we knew in advance, from personal experience, that a reasonable quantity of users held active profiles in both platforms. Also, we were sufficiently active in both systems to be confident of our capacity to interpret the practices we would eventually encounter. Both Twitter and Plurk have mobile and desktop versions, allowing for cross-platform comparison.

IMs (MSN, Gtalk and/or Skype) offered a counterpoint to the microblogging model.

Users were sampled by a snowball procedure, starting in Plurk, which has a smaller number of users than Twitter. The starting 'plurker' was known to access the system more than 5 days a week and during most of her online hours. Her Plurk profile page showed all possible badges and karma above 100 . She was also known to be a heavy Twitter user, with more than 3,000 followers, and to make frequent use of different IMs. This and subsequent users were asked to respond to an online questionnaire with 14 questions, one of which concerned their willingness to participate in an in-depth, semi-structured online interview. The questionnaire also asked which IM would be preferred for the interview, and why. Finally, respondents were asked to suggest a pair of users of both, Plurk and Twitter. The first suggestion should be someone with a pattern of usage believed to be similar to the respondent's own and the second someone who appeared to make a different use of Plurk and Twitter.

Each interview lasted about 90 minutes and the interviewees were invited to send us an image of their profile and timeline or conversational screens in Plurk, Twitter and their chosen IM, in their desktops and mobile platforms (when applicable).

1 Karma is a numerical value displayed in the profile of each individual Plurk user. Badges are icons displayed under the Karma level. Both are indicators of engagement with Plurk (posting, replying to posts, inviting friends to join Plurk, etc.)
Data gathering was considered complete when an equilibrium between variation and redundancy was reached in the responses to both, questionnaires and interviews.

6. RESULTS

We developed a qualitative study, based on a small sample of users of two microblogging systems (Twitter and Plurk) and at least one IM. Data was collected via three different instruments: questionnaire, interview and visual interface analysis. The snowball sampling procedure lead the sample away from Plurk users with considerable speed – the first 9 questionnaires were responded to by Plurk, Twitter and IMs users, the next 4 respondents used Twitter and IMs, but not Plurk. The questionnaire answers of the latter were taken in consideration, but they were not included in the interviews.

All Plurk, Twitter and IM users who responded our questionnaire were asked to participate in an online interview. All agreed, but only five were available during the interview period. Four of them agreed to send us the images of their profile and interaction screens, as seen in their own desktop and mobile platforms.

6.1 Questionnaire

Questionnaires are usually associated with surveys and statistically representative data. This is not the case in a qualitative study, as the reduced size of the sample renders statistical relations meaningless. For this reason, we present and discuss questionnaire answers in absolute quantities.

6.1.1 System Use

All 13 respondents used Twitter, GTalk and Skype. Twelve used MSN and 9 were Plurk users. Only one indicated MSN as their preferred IM for the online interview, all others chose to be interviewed via Gtalk.

6.1.2 Frequency of use

All reported using Plurk on a daily basis. Twitter followed a different pattern, with 6 users accessing daily and 5 weekly. Two respondents have profiles in Twitter but never use them. Use of IMs was more diversified, with 9 using them every day, 2 weekly and 2 only when previously agreed with someone (Figure 1).

6.1.3 Quantity of contacts

The number of people one can communicate with is an important indicator of how a conversational system is used. The quantity of contacts was measured on a Lickert Scale, varying from ‘0-49 contacts’ to ‘more than 1,000 contacts’. In Twitter, we considered the number of users followed by the respondent (those whose tweets the respondent chose to read) rather than the number of followers (those that chose to read the user’s tweets). The number of contacts in Plurk is significantly smaller than in Twitter (Figure 2). The latter has the largest number of contacts, indicating different usage patterns in relation to Plurk. The number of contacts in IMs present higher levels of variation.

6.1.4 Common contacts

Users’ perception of intersections between their contacts in Plurk, Twitter and IMs was addressed with a Lickert scale question varying from ‘none’ to ‘all’ (Figure 3). All users considered that at least half of their contacts were the same in all conversational systems.

6.1.5 Purpose

In order to verify whether different systems were used for different purposes and/or with different social groups, the questionnaire included questions about the frequency of use of each system to communicate (a) with friends, (b) with family, (c) for professional networking (for example, to improve one’s visibility in the job market) and (d) to keep up to date with national or international events (including news). Figures 4, 5 and 6 present the results.
Responses indicated there were clear variations between the types of interactions in different systems. Plurk is predominantly used to talk to friends (two respondents said that they preferred Plurk for family interactions, but this appears to be a distortion of our sample, as we later confirmed that these respondents were husband and wife). Consistent with results in previous literature [21], questionnaire respondents use Twitter predominantly as a source of information about national and international events and, less often, as a professional platform (for networking or visibility). IMs were most frequently used to interact with friends and family.

6.1.6 Customization

Finally, we asked whether people chose to customize their profile and communication pages. Customization proved popular, being adopted by all Plurk users and most Twitter and IM users (Figure 7).

6.2 Interviews

Interviews were structured in two topics: patterns of adoption and preferred device. Interviewees also provided images of their screens that have been comparatively analysed.

6.2.1 Adoption

Plurk and Twitter are seen as many-to-many interaction systems, while IMs were most often referred to as one-to-one conversational tools. However, all interviewees were aware of the possibility of group conversations in IMs and also reported using one-to-one, non-public interaction modes in Plurk [private Plurk] and Twitter [direct message]. One user apologised: "I used Plurk for private conversations, but this is something I don't usually do"

The limitation of characters direct Plurk and Twitter to short interventions, while IMs were seen as more appropriate for long conversations. However, Plurk as Twitter users circumvent this limitation by dividing longer messages in parts and posting them in sequence.

Users consistently indicated preference for Twitter as an information gathering tool and a platform for professional networking and business promotion, while Plurk and IMs were considered more suitable for conversation. "If I want to chat, I use Plurk or GTalk. Twitter is for information", "to make yourself known" and "to spread the word about your business'. Trivial matters, however, were thought not to belong in Twitter: "people don't know how to use Twitter, they post 'I have a headache', 'I woke up early'. This you should do on Plurk".

These opinions reflect a general perception that Twitter is a more public system than Plurk. One user mentioned feeling comfortable posting pictures of her child on Plurk, but not on Twitter. Another user said "I use DMs [direct, private messages] in Twitter when I want to give an address or book a meeting with someone specific. It does not matter whether my Twitter timeline is private, someone can retweet any of my tweets and make it public". Awareness of this possibility is reflected in the fact that only one interviewee had a private profile in Twitter (only authorized users can read their messages). On Plurk, however, where the number of contacts tend to be much smaller, the profile of all interviewees were private.

Some differences were also reported in the use of GTalk, MSN and Skype. The former was said to be the best for fast pace conversations and more suitable for mobile platforms, because it is lighter than MSN or Skype. It was also frequently mentioned as
All interviewees confirmed that they choose different systems for different types of interaction, independent of having the same contacts available in more than one, or in all of them. One user said "This difference is deliberate. I know that in each place I will find different information: in one more general things, in another facts about people who are closer to me." One notable exception is the choice of system to interact with family members, that is mostly defined by which system is already used by one's relatives. New systems are suggested to friends, but not usually to family: "the level of digital literacy of most members of my family is very low, thus most of my relatives prefer to use systems they already know, the simpler ones"

6.2.2 Preferred Device

All interviewees manifested a preference for using conversational systems in notebooks and desktops instead of mobile platforms. On the one hand, this preference is due to hardware interfaces (the availability of keyboard and larger screens). Problems with mobile visual interfaces were also reported, the suppression of information to fit on smaller screens, or, in Plurk's case, the alteration of the timeline structure by a popular mobile application. The interface of Twitter's most popular mobile application is very similar to the one used on desktops and the purpose of the system is identified with portability "Twitter was created to be used with mobile phones". However, certain limitations of mobile platforms also affect interaction practices in Twitter, as indicated by a user who said "When I use Twitter on the mobile phone I post less links, because it is not so easy to access websites with the phone."

6.2.3 Interface Analyses

Plurk, Twitter, GTalk, Skype and MSN offer limited possibilities of customization. Apart from cosmetic alterations, such as background pictures and interface colours, we found very little difference between the images of the screens of our interviewees.

The profile of all interviewees in all conversational systems included information that facilitated offline recognition. Only one interviewee did not use a recognizable picture of their face in Plurk's case, the alteration of the timeline structure by a popular mobile application. The interface of Twitter's most popular mobile application is very similar to the one used on desktops and the purpose of the system is identified with portability "Twitter was created to be used with mobile phones". However, certain limitations of mobile platforms also affect interaction practices in Twitter, as indicated by a user who said "When I use Twitter on the mobile phone I post less links, because it is not so easy to access websites with the phone."

One very important difference between Plurk and Twitter is the organization of their timelines. Following the usual pattern of blogs, Twitter's timeline is vertical, featuring the tweets of all followed profiles, in descending chronological order. This distribution creates difficulties in holding a conversation on Twitter's timeline and, at the same time, transforms followed users conversations into informational noise on one's timeline: "It is annoying that conversations that don't interest me invade my timeline, reappearing every time someone I follow tweets something, independent of being a reply to a previous post".

Plurk's messages are distributed in a horizontal timeline. Replies are nested in the original message, constructing secondary vertical structures, with the last comment at the bottom. This organization in topics is highly favourable for conversations: "Plurk is better organized, each plurk is placed as a different topic and each interaction is linked to the original topic. It is much easier to follow a conversation and even to enter a discussion that started when you weren't online". Plurk also allows the user to select between seeing all plurks, only plurks created by himself, only plurk he has previously replied to, only private plurks, or only favourite plurks and replurks. Additionally, Plurk periodically indicates how many new plurks haven't yet been read and allows replies from unknown users to be seen by anyone who follows the Plurker responsible for the original message. It is important that "you can read what the friends of your friends said about their plurks and reply to their replies: this creates a special setting for group conversation". These features make Plurk the most convenient for social interaction within tightly knitted social groups: "I normally say that Plurk is for the people I would welcome to my house."

Indications of who is currently available for interaction have been mentioned as a positive feature of IMs: "I can see if the person is online and wanting to chat by the colour - I look there and if there is a green light, I know that they want to be called"

7. DISCUSSION

The qualitative nature of our study does not allow for broad generalization of results. However, the small size of the sample allowed us to obtain in-depth information, that would not be verifiable in different circumstances. Combining data from questionnaires, interviews and interface analyses, we have identified several aspects of different interaction patterns with Plurk, Twitter and IMs. These respond to a complex set of system and interface affordances and socio-cultural and cognitive contexts of adoption. Our results suggest that these can be understood in three broad categories of affordances that we chose to call representational, technical and social affordances. Representational affordances can be understood as a combination of Hartson's sensory and cognitive affordances [13] and therefore are related to the perception and interpretation of sensory inputs (sounds, images, texts). We encountered three sub-types of representational affordances: perceptible, false and hidden, the latter with three more sub-types: concealed, unintentionally hidden and inconspicuous. Technical affordances embrace Hartson's physical and functional affordances and the interactivity affordances we proposed earlier in this paper. We identified three sub-types: physical, functional and architectural. Socio-cultural affordances are related not only to the social or cultural influences but also to the political, economic, geographic, and cognitive aspects that influence user interaction. Six sub-types have been identified: representational, awareness, conversational, ambient, communal and contextual.

The intersection between the three broad categories of affordances are represented by interaction and interactivity affordances, the former predominantly related to socio-cultural affordances and the latter to technical and representational affordances. Together, they comply with the notion of socio-technical affordances [20] (Figure 9).

We are convinced that this framework facilitates the identification of affordances and their relation to social interaction practices mediated by online conversational systems. However, it is important to emphasize that we do not understand this differentiation between types of affordances as a closed set of clearly delimited categories. As previously mentioned, social and
technical affordances are not mutually independent. The same is true of representation affordances, which depend on technical features (that make some types of sensory inputs feasible, for example) and on socio-cultural configurations (that shape understanding and interpretation of the sensory inputs). This is not a flaw of this specific analysis into types and subtypes of affordances, but an inevitable consequence of the imposition of analytical order on a complex reality by any categorization.

An example of a false affordance, that is, an action that is not possible, but is suggested by system and interface design, is the sending of direct messages to a group of Twitter users (multiple direct messages).

7.2 Technical affordances

Physical affordances are also important influences on online conversational practices. The idea of microblogging has always been connected to portability (the limit of 140 characters is said to derive from mobile phone standards). However, all interviewees preferred to use post from desktop or notebooks, mostly due to mobile phones' physical restrictions.

Functional affordances correspond to higher level system definitions, that enable certain actions (but not others). The possibility of posting images directly on Plurk's timeline, but not on Twitter, is a good example.

The difference between the social appropriation of Plurk and Twitter derives significantly from the distinctive structures of their timelines. The relevance of this feature suggested the existence of architectural affordances, that correspond to information architecture (at system level) or information design (at interface level).

Interactivity affordances affect the interaction between the user and the system, embracing physical and representational affordances. The difficulty of publishing links when using Twitter on mobile platforms, for example, derives from constraints manifested as interactivity affordances.

7.3 Socio-cultural affordances

Interaction affordances derive from established practices of interaction with a system. A clear example is the use of retweets, a practice introduced by users that led to the inclusion of new technical (functional) and representational (perceptible) affordances in Twitter's web interface.

Presentational affordances are related to the expressive control of self-presentation [12]. The openness of Twitter, for example, leads to privacy concerns that limit expression in that system when compared to Plurk or IMs. On the other hand, it creates a potentially large audience, that is emphasized by the explicit information about the number of followers on user profiles, inviting appropriations such as business and self promotion. Plurk's equivalent features are, for example, the quantity of karma or badges. Both are conquered by high levels of effective participation (plurking and having one's plurk responded to; inviting friends that effectively join Plurk, being a Plurk user for a certain period, etc.). The result is a different set of presentational affordances that attempt to induce community involvement rather than popularity.

Awareness affordances facilitate the perception of the presence and or availability of other users. Indications of who is currently available for conversation on IMs for example.

Conversational affordances are composed of three features: addressability of messages, speed of transmission and portability [8]. Addressability is one of the main differences in the use of Twitter, Plurk and IMs: the first is used to address larger audiences, the second is restricted to conversations with smaller groups and the third are mostly seen as best for one-to-one conversation. Addressability is also related to speed of transmission and portability: this combination is responsible, for example, for Twitter's capacity for real time information-sharing.
Ambient affordances contextualize group awareness within the system. For example, the content and mode of expression of the original plurk define the tone of subsequent comments. Also, the user responsible for the original message can delete the topic, but cannot delete specific comments about it.

Communal affordances facilitate the development of strong social ties. Plurk's nested comment system is one such affordance: by emphasizing conversation, it calls attention to the interests and opinions of other plurkers.

Finally, contextual affordances are related to socio-cultural contexts of system use and social interaction. A good example is changing the language of tweets depending on the group of followers that constitutes the target public for that message.

8. Conclusion

We proposed the existence of an interplay between technology and socio-cultural settings, leading to the recognition of the mutual influence between interface affordances and user practices. This perception led to our challenging deterministic interface design practices. Drawing upon the idea of socio-technical affordances, we undertook a qualitative study of mediated interactions in online conversational systems.

The results obtained support an analytical framework for the study of affordances as socially-situated technological features. This perspective has proven fruitful for understanding both, interface affordances and social interaction practices within online interpersonal conversational systems. Moreover, it has revealed the relationship between system and interface affordances and socio-cultural and cognitive contexts of adoption, which directly affects the way in which those conversational systems are used.

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10. REFERENCES


