Tracing Twitter: the rise of a microblogging platform

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Abstract

This article uses 'interpretative flexibility' as a concept to analyse the early development of one specific microblogging site: Twitter. By tracing microblogging's instable meaning in its early years (2006–10), we try to understand how the platform's meaning was shaped by a variety of human and non-human actors: technological design, usage, content and business models. By tracking microblogging's instable meaning in its infant years, we may get a fuller understanding of how this new technology plays out in a complex Internet milieu of push-and-pull forces. Reconstructing interpretative flexibility while the technology is still in flux – and thus open to manoeuvring – may give rise to new perspectives on how power relationships transpire in a networked environment.

Keywords microblogging; Twitter; social networking sites; Web 2.0; business models ; networking theory; media technologies; interface design

Introduction

In the new media ecology, networked tools and applications are launched almost every day and they compete to become standard services for channelling information, communication and media (ICM) activities. Although many would argue that the Internet has already yielded a number of stabilized user practices, such as online searching, e-mailing and blogging, Andrew Feenberg (2009: 80) argues many of these practices are temporary arrangements 'that may enter into flux again at a future date'. Each launch of an innovative technology service or

specific application may upset the Internet's feeble balance, so that stabilized use or interpretative closure is far from achieved. In this volatile environment, Twitter, a platform for microblogging, emerged in 2006. Five years after its launch, Twitter had become immensely popular as it attracted almost 180 million monthly users worldwide.[1] During this first stage, the platform's meaning was variable and contested on various grounds. Was Twitter a versatile communications service or an application embedded in social network sites (SNSs)? Was it a means of one-way mass communication or an interactive tool for community organizing? Was it a device for news updates or a mass marketing tool? Although Twitter has now become an established brand name, the meaning of microblogging has not stabilized for once and for all.

This article aims to look back on the early stages of Twitter's development between 2006 and 2010 – a stage characterized by competing usage, interface adjustment, change in content and variable business models. How did Twitter and the socio-technical practice of microblogging evolve in its first five years? What actors were involved in the struggle to define this platform's dominant meaning? In order to answer the first question – how to trace Twitter as a technology-in-flux – my theoretical frame of reference is inspired by social constructivists, who have taught us how and why some technologies achieve interpretative closure in a struggle for survival while others do not. Actor-Network Theory (ANT) will help to highlight how the mutual shaping of technology and users evolved during this initial stage (Bijker 1995; Pinch and Bijker 1987; Latour 2005). The second question requires the help of a specific social constructivist concept: interpretative flexibility. Interpretative flexibility contends that each technological artefact, during the first stages of development, has different meanings and interpretations for various relevant social groups (Pinch and Bijker 1984). These social groups can be users and producers but may also entail other relevant human actors, such as researchers or journalists. Besides, non-human actors, such as an information system's technical or content characteristics, might enable or limit the social construction of a

new tool (Doherty, Coombs and Loan-Clarke 2006; Latour 1992, 2005). To this I would like to add another non-human element affecting a tool's interpretative flexibility: business models. Few researchers recognize business models as a relevant non-human actor in the process of social construction (Orlikowski and Iacono 2001).

Analysing Twitter's first five years, I will particularly look at how its technological features (interface, hardware) evolved in close relation to mediated social practices, content and business models – integral aspects of the platform's transforming function. The concept of interpretative flexibility serves as a prism to look at a complex process of struggle to achieve a stable meaning. However, the larger aim of this platform analysis is to gain a better understanding of the power relationships involved in shaping emerging channels for communication *before* their meaning has fully stabilized and *before* commercial and ideological interests have settled. By tracking microblogging's instable meaning in its infant years, we may get a fuller understanding of how this new technology plays out in a complex Internet milieu of push-and-pull forces. Reconstructing interpretative flexibility while the technology is still in flux – and thus open to manoeuvring – may give rise to new perspectives on how power relationships transpire in a networked environment.

Twitter: hardware versatility and ubiquitous service

First described as the 'SMS of the Internet', the technology to send and receive text-based messages of up to 140 characters known as *tweets* was initially, in 2006, characterized as something in between a short message service, a phone call, an e-mail and a blog: less cumbersome than keeping a blog, less exclusive than talking to one person on a phone, less formal than e-mail exchange and less elaborate than most SNSs. The 140-character limitation was chosen because of its compatibility to mobile phone SMS services, even if the application quickly spread via a number of other hardware devices, such as personal digital assistants, laptops and desktops. Hardware versatility has been an important feature in the dissemination

of this new tool. Twitter's strengths, from the very onset, were its versatility as a tool and its brand autonomy as a ubiquitous service. At the 'Future of Media' panel in New York, Twitter co-founder and executive Jack Dorsey said he wanted 'Twitter to be like electricity, e-mail, SMS, or phone', indicating a strong preference for a multi-purpose tool and service (cited in Schroeder 2009). Twitter's capacity to deliver messages to various different hardware platforms has been essential to its success; tweets can originate from text-messaging on a cell phone or PDA. In a 2009 Pew Internet study, Lenhart and Fox reported that Twitter users are most likely to access the service through wireless Internet on mobile devices. From the very onset, the platform's intention was to be an open, mobile channel primarily for textual communication.

When Twitter was launched, it was not the only or even the first microblogging service; other stand-alone microblogging services such as Tumblr had already appeared on the scene. Some of these services were country-specific and some combined microblogging with other services such as file sharing. In contrast to its competitors, Twitter positioned itself as an 'autonomous' service, unconnected to one specific tool, one specific country or one specific (SNS) service. Even though many SNS services are designed to be multi-purpose tools – comparable to Swiss knives – users and markets are always looking for one specified exploit. During the first years after its emergence, Twitter was often called a service in search of a user application; the exact purpose of this new technology was discussed amongst journalists, and business analysts openly wondered about the technology's most evident usage, let alone its 'killer app' (Arceneaux and Schmitz Weiss 2010). Researchers 'followed the hardware' to understand the motives of early adopters who are commonly eager to tweak technologies to suit their needs or who invent needs for unspecified tools. Several information scientists attempted to characterize Twitter by analysing its activity streams (Krishnamurthy, Gill and Arlitt 2008); others tried to define Twitter's user rationale by mapping network nodes

in geographical space (Java, Finin, Song et al. 2007). These researches mostly observed how subtle adjustments in hardware affected interaction between technology and groups of users.

So how did Twitter adjust its tool in response to its early users, and, arguably, to its early competitors? Several times during the first two years, the microblogging service steered its technological design to favour integrated use over stand-alone purposes; in order to interlink with existing social networks such as Facebook, Twitter gradually adapted its hardware to fit other service's standards. About the same time when Twitter emerged, Facebook added its own microblogging tool to its already hugely popular SNS: NewsFeed highlighted information on recent profile changes, upcoming events and birthdays, among other updates. In 2007, Facebook also adopted Twitter on its site, which tremendously boosted the latter's popularity. Three years later, virtually every SNS provides links to Twitter, as do most major news and entertainment organizations. In April 2010, Twitter announced @anywhere, a feature that expands Twitter's reach but also makes it more compatible with services like Facebook and Google. Twitter's ambient integration into an environment of affiliated technologies required its owners to further specify its design, thus making the needs of its users subservient to standardized compatibility requirements.</IP>

In spite of Jack Dorsey's explicit wish for Twitter to be an open, versatile tool 'like electricity', it has gradually become an embedded microblogging service. The changes in hardware and interface may seem futile, but their significance becomes more poignant in the light of larger Internet developments. Jonathan Zittrain observes a general trend of Internet companies and hardware producers to turn generative, open technologies into specified applications, a trend he labels 'appliancization' (Zittrain 2008: 101–05). In terms of hardware, he illustrates this trend with Apple's iPhone, whose technology and design can no longer be tinkered with. In Zittrain's words, there is a 'wholesale shift of our information ecosystem away from generativity' towards 'tethered appliances and services which increasingly constrict a potential sea of uses' (Zittrain 2008: 102). He regards this trend as a response to

security demands but also as a consequence of global commercial interests. I will return to the question whether Twitter adjusted its interface and usability standards to facilitate incorporation in other major platforms – hence catering to monetizing interests – in a later section. Before including business models in the analysis of this platform's evolving meaning, we need to examine the relation between technology and its usage.

Microblogging as a mediated social practice

During the first five years of Twitter's development, what kind of uses transpire as most typical or dominant? How did microblogging become a mediated social practice and how closely did Twitter's brand name become associated with microblogging? In August 2010, Wikipedia listed nine 'notable uses' for Twitter, each describing a real-life (and real-time) context in which Twitter had recently functioned as a central tool: in campaigning, legal proceedings, education, emergencies, protest and politics, public relations, reporting dissent, space exploration and opinion polling.[2] One can read Wikipedia's list of notable uses as an inventory of the various social grounds on which Twitter is shaped to become a *mediated* social practice. Social practices are everyday activities that have a routine status, for example 'talking to friends' or 'updating oneself about the world'. Once routine practices are permeated by a specific ICM tool we call them *mediated* social practices, for instance 'talking to friends *on the phone*' or 'watching *television* news'.[3] By tracing how media tools affect quotidian social practices – and, vice versa, how social practices are influenced by a tool – we may learn what forces are involved in this process of mutual shaping. It should be noted that a new social practice like microblogging, in order to become fully integrated in daily life, has to compete with older tools that have already nestled into a particular routine. For a new tool to become ubiquitously used, its brand name ideally becomes synonymous with an established daily routine, for example the way 'googling' has become virtually identical with Internet search.

One significant feature that helps distinguish mediated social practices is the interface's *mode of addressing.* As a microblogging service, Twitter.com allows registered users to deploy various addressing modes: senders may restrict delivery to a small circle of selected persons or to a specified number of subscribers known as 'followers' or, by default, may allow open access. Twitter's settings initially positioned it as a service for two-way communication, but how did it evolve? We can identify a number of activities where Twitter competed with existing media to become the preferred mediated tool. I have selected six general categories of use, based on modes of addressing rather than on actual uses, and added how they relate to older mediated practices:[4]

1. Conversation and dialogue (like small talk on the phone, but textual rather than oral and not restricted to one person; like chatting, but not tied to a PC or website interface).

2. Collaboration and exchange (like e-mail or SNSs, but directly addressed to specific users, not tied to PC or website interface).

3. Self-expression and self-communication (like blogging, but tweets are restricted in length, and not tied to PC or laptop).

4. Status updating and checking (like SMS, but sending updates is not restricted to addresses saved in one's phone memory).

5. Information and news sharing (like websites, but update alerts may be send through mobile devices like phone or PDA).

6. Marketing and advertising (like spam, but targeted in terms of location, expressed interests and/or connections).

Although this list is of course anything but exhaustive, these six social practices may arguably be the main grounds for Twitter to compete with other ICM tools in becoming a mediated social practice. Activities 1 and 2 are practices involving *two-way communication* between a circle of selected persons. Examples of this type of use vary from collaboration with a number

of colleagues resulting in a Twitter-mediated office project to Iranian protesters deploying Twitter as a means to organize their uprising against the regime in 2009. Activities 3 and 4 are forms of *one-to-many communication* through specified lists of subscribers, illustrated for instance by the concerted efforts of thousands of people to find a missing child. Twitter's most unique feature, as compared to competing media, appears its addressing mode that allows the activity of 'following': each user can choose whom she wants to 'follow', thus to receive tweets from, without requiring the latter to give permission first. For instance, a celebrity may use Twitter as a medium to continuously address his fan base or a politician uses the tool to update her following of the latest news in the election campaign. Activities 5 and 6 are social practices that involve *many-to-many communication* that may be unsolicited and open to everyone. Twitter is used by news organizations to send out alerts to thousands of enlisted subscribers, but is also used as an advertising tool to send restaurant tips to users in a specific geographic location.

By virtue of its open design as a multi-purpose tool, Twitter has kept open a variety of potential uses, and users engaged in exploring the full range of this potential. Social and information scientists, for their part, have been eager to find Twitter's most appropriate uses. Early research on Twitter's usage reveals a preference for the exchange of daily conversation between friends and for sharing information and news alerts at a community level – corresponding to practices 1 and 5 in the list above (Java, Finin, Song et al. 2007; Mischaud 2007). Other researchers singled out practices 1 and 2 to explore how and why they developed. Behavioural scientists Zhao and Rosson (2009: 243), for instance, restrict their research to Twitter's role as an informal communication medium in the work place (practice #2); they find that the web service can be used to enhance a feeling of connectedness and to build common ground for collaboration. Yet other researchers advocated specific usage of the tool to infiltrate a particular social practice. Information scientists Honeycutt and Herring (2009) observed that Twitter is most appropriate for conversational interaction (practice 1)

and collaboration in larger groups (practice 2). While these researchers acknowledge Twitter may not have been especially designed for informal collaborative purposes, they suggest that 'design modifications could make microblogging platforms such as Twitter more suitable for collaboration' (Honeycutt and Herring 2009: 9). Evidently, researchers actively tried to *shape* the tool's meaning by suggesting modifications to strengthen Twitter's interactive features and by pointing at implications of certain design choices.

Over the years, Twitter's interface has indeed been modified to promote certain types of usage over others, but not the way the above-mentioned researchers had anticipated. In the fall of 2009, Twitter changed its design, allowing users to follow *lists of authors*. As a result, status updates increasingly happened through organized networks rather than via self-selected lists of receivers, indicating a shift in addressing mode from interactive communication (practices 1 and 2) to one-way (self)communication and status updating (practices 3 and 4) on the one hand, and to information and news sharing (practice 5) on the other. Indeed, this decisive shift in interface settings results in changed user routines. In 2010, information scientists Kwak, Lee, Park et al. reported from their comprehensive data analysis of all Twitter users that only 22 per cent have reciprocal relationships, while 68 per cent of users are not followed by any of their followings in Twitter. After 2009, Twitter has indeed become more of a followers listing and information tool, while its use as a conversational microblogging platform has decreased: 'People follow others not only for social networking but for information, as the act of following represents the desire to receives [sic] all tweets by the person' (Kwak, Lee, Park et al. 2010: 594). By adjusting its addressing mode, Twitter chose to accommodate unidirectional (mass) communication at the expense of its function as an interactive communication channel, even if it can still be used as such.

Underscoring the shift in user practice is a swing in Twitter's user demographics. Most social media, such as Facebook and MySpace, gained their popularity from large contingents of young, educated users – teenagers, college students, young professionals – at a stage of

their lives when they are looking for contacts and relationships, both professional and personal. Twitter's user demographics have been different from the beginning. Of Twitter's initial users, the majority consisted of older adults who might not have used other social sites before. During Twitter's first two years, the social network gained popularity in business settings and news outlets, resulting in an early adopter profile of older (35 and up) professional users.[5] However, as the Twitter audience soared, markedly after May 2009, the group of younger adults grew at a much faster rate, resulting in an overwhelmingly majority of users aged 35 and under (Lipsman 2009). Along with this shift came a gravitation towards few heavy Twitterers: a small but prolific group of 10 per cent of Twitter users account for over 90 per cent of tweets (Heil and Piskorski 2009).[6] What we can derive from these demographics is that Twitter is beginning to filter more into the mainstream by catering news feeds and celebrity updates, a trend that is also underscored by a notable shift in gender demographics.[7] From this proliferation of user groups, we can conclude that after May 2009, Twitter has gravitated away from its use as an interactive communication tool ('a friend's tool') used by professional adults towards a 'followers listing tool' used mostly for entertainment and news updates by young adults.

In the light of the above, what kind of mediated social practice does 'microblogging' currently refer to? And what has 'Twittering' in everyday life come to mean? Arguably, status updating (practice 4) as well as information and headline news sharing (practice 5) have become the dominant social uses of microblogging. Twitter's prevailing mode of addressing has shifted away from two-way communication towards being primarily a one-to-many or many-to-many publishing service (Huberman, Romero and Wu 2009; Weng, Liang and He, 2010). In 2011, the common meaning of microblogging is still somewhat ambiguous, but less variable than it was in the beginning. As a mediated social practice, 'Twittering' has become synonymous with microblogging – which is why Facebook and Google have allowed Twitter as part of their services, likely at the expense of their own microblogging services Newsfeed

and Buzz. And yet, this does not mean that the period of interpretative flexibility has resulted in a fixed meaning. The balance between various corporate social media platforms is precarious and vulnerable to change. To further substantiate this shift, we also need to look at microblogging's changing form and content.

Tweets as form and content

The interpretative flexibility that surfaced in the discussion of microblogging as a mediated social practice also relates to the content of its messages. Tweets can be characterized by various features, only one of which appears beyond dispute: the fact that messages are less than 140 characters in length. But apart from their maximum length, the nature of tweets' contents is subject to interpretative contestation by various actors. Debates revolve around the question whether tweets are conversational, expressive or informational in tone and whether messages contain essential or non-essential information. In discussing the quality of content, researchers also touch upon the meaning of this mediated social practice: what function does microblogging serve?

The most poignant debate occupying researchers during Twitter's first five years concerned the question whether microblogging supports everyday small talk or whether it has broader social or cultural significance. For instance, a study performed at the apex of Twitter's popularity in August 2009 by marketing agency Pear Analytics (Kelly 2009) analysed 2000 tweets over a two-week period by classifying them into six categories: news, spam, self-promotion, pointless babble, conversational messages and pass-along value (Twitter's so-called cc-function or retweet). The study found 'pointless babble' to be the largest category of Twitter content, making up over 40 per cent of the total number of messages sampled. Conversational messages accounted for 37 per cent, while self-promotion made up almost 6 per cent and news from mainstream publications almost 4 per cent. The researchers conclude that approximately 83 per cent of all tweets comprise of short conversational, expressive and promotional statements that form the heart of social talk. This

categorization of tweets was promptly disputed by social networking researcher danah boyd (2009), who responded to the survey stating that what the Pear researchers labelled 'pointless babble' is better characterized as 'peripheral awareness' or 'social grooming'. In her earlier work, boyd had argued that the meaning of tweets reflects a form of 'networked sociability' aimed at maintaining social or intimate relationships with friends, following high-profile users and connecting with other people – close and remote (cf. boyd and Ellison 2007). Clive Thompson (2008), in his journalistic-ethnographic study of Twitter users, had already called this phenomenon a paradox of ambient awareness:

> Each little update – each individual bit of social information – is insignificant on its own, even supremely mundane. But taken together, over time, the little snippets coalesce into a surprisingly sophisticated portrait of your friend's and family member's lives, like thousands of dots making a pointillist painting.

In other words, the value of textual communication in real time lies in an everyday routine that favours phatic rather than cognitive messages.

While some academics and journalists emphasized the conversational nature of tweets, a fair number of researchers focused on their informational content, by looking at Twitter's function either as a headline-news distribution system (Kwak, Lee, Park et al. 2010) or as a journalistic tool for facilitating online dissemination of short fragments of information from a variety of official and unofficial sources (Hermida 2010). Couched in terms of information, a similar dilemma arose in relation to defining the meaning of tweets and gauging their 'weight': news tweets may be about the latest development in the Middle East or about Lady Gaga's cold. In line with the debate above, information scientists Blake, Agarwall, Wigand et al. (2010) concluded, 'Twitter has shown how a medium for social networking and micro-blogging can be used as both a tool for delivering essential information, i.e., news, as well as a medium for delivering non-essential information, i.e., personal messages'. The discussion about a tweet's typical content foregrounds the tool's essential ambiguity as a channel both

for lightweight communication and for news information. However, essential and non-essential contents have always coexisted, even in what we call quality newspapers; therefore, I do not think it is surprising to find these two types of content emerge side-to-side in a new medium. What is more remarkable, though, is how tweets have been increasingly used as sources for old media to attract new audiences and to trigger conversations about the news they produce (Arceneaux and Schmitz Weiss 2010). A number of newspapers signal 'trending topics' by analysing Twitter's most popular tweets of the day, because microblogging is where things happen first. Journalists laud Twitter's potential to tap into near-boiling topics – content that surfaces in conversations before it hits the news.[8]

The debate on Twitter as a lightweight conversational tool or a serious tool for news gathering once again reflects the site's interpretative flexibility in the first years of its existence. Of course tweets carry both meanings, but if we look at the adjustment of Twitter's interface over time, we can observe a subtle but decisive change in favour of the latter interpretation. When the site was first launched, Twitter users were asked to respond to a simple four-word prompt: 'What are you doing?' This prompt emphasized the conversational and personal nature of a tweet and gave a specific directive to its content. In November 2009, Twitter changed its guidance posting from 'What are you doing?' to 'What's happening?' Both prompts are starters for everyday small talk. And yet, there is a difference between the two: whereas the first prompt invites tweets that can be described as 'interactive personal talk', the second prompt triggers news and information that also goes beyond the personal. The motto of Twitter's home page now reads, 'Share and discover what's happening right now, anywhere in the world'. This subtle but meaningful change in Twitter's interface indicates a strategy that emphasizes (global, public) news and information over (personal, private) conversation in restricted circles, corresponding to the technical adjustments made to the interface in terms of lists of followers.

The modification of Twitter's prompt is perfectly aligned with a shifting emphasis from Twitter's interactive conversational function to its informational followers' function, as outlined in the previous section. Twitter's exponential growth as a worldwide medium has likely spurted its metamorphosis into a mass medium for (self) communication, explaining the adjustment as a way to invite news and information as well as personal messages that attract large numbers of people. While some researchers, such as Marwick and boyd (2011), have recently examined how Twitter users adapt to this newly inscribed usage as a many-to-many tool by conceptualizing an imagined audience evoked through their tweets, others explain the shifts in Twitter's interface design by exploring the site's growing interest in commercial entertainment value (Beer 2008; Demerling 2010), which brings the issue of interpretative flexibility to the next important element: the economic context in which microblogging services such as Twitter evolve.

Twitter's emerging business model

Just as media watchers initially called Twitter a service in search of a user application, four years after its launch market analysts wondered whether Twitter was still in search of a business model (Miller 2009b). Until 2010, the company's owners remained vague about plans to monetize their popular service; they raised enough money from venture capitalists to allow time to find a suitable revenue model.[9] At some point, though, business analysts began to ask whether Twitter's owners were interested in business models at all (Smith 2009). Like other social networking sites, such as YouTube and Facebook, Twitter relied on the strategy to build an audience of users first and find revenue streams later. Choosing a business model seemed subordinate to building a user base, but in fact, selecting a revenue model is also the result of a company's ability to develop the site's potential usages and to build trust among user bases before testing the effectiveness of a commercial tactic. Business models are not

ready-made strategies, but they formed an important element in the shaping of Twitter's meaning during its first five years.

Since the beginning of this century, Web 2.0 platforms have defied traditional business models, stimulating economists and managerial experts to develop new perspectives on value creation through technological services. In contrast to old media strategies, leveraged by the entertainment and culture industry to sell products to consumers, digital tools and services generated by contemporary creative industries yielded a new complex logic of usage that no longer fitted the model of producers versus consumers, or products sold by advertising (Potts, Cunningham, Hartley et al. 2008). The networked information environment necessitated the question whether a new economic model is needed to provide a sustainable alternative to market-based models of provisioning information, communication and knowledge. Even if many SNSs boom before developing business models, in the long-term they have to survive in a space that is profoundly commercial and dominated by large corporations. In the course of five years, we have witnessed how Twitter's economic viability was explored in various ways. First, Twitter was exploited as a general communications tool that helped businesses create (customer) value. Several years into the site's existence, there were already a number of books explaining the tool's power to 'dominate your market' or how to 'get rich with Twitter' (Comm and Burge 2009; Prince 2010). Second – and this will be my main point of analytical interest – Twitter was busy to develop its own business model as an autonomous, stand-alone microblogging service. This process has been watched minutely by market analysts interested in the site's monetizing strategy, whether as a stand-alone company or as potential take-over target for other platforms.[10]

Since 2005, networked sociability has become a valuable resource in a commercial Internet environment populated with competing social media platforms. The question how this resource can be capitalized was a topic of deliberation among economists and marketers – once again emblematizing microblogging's interpretative flexibility. Conventional

advertisement- or subscription-based models never really applied to Web 2.0 platforms. SNSs hinge on people's willingness to make connections and to fill space and time with communicative and cultural content, giving users power over the network. Microblogging platforms, more than other SNSs, rely on user's ability to initiate and maintain 'weak ties' and to manage substantial numbers of contacts. As Clemons (2009: 46) argues, online social networks need to be viewed as meeting places where people congregate to exchange information and social talk, observe each other, check out people's status and enjoy novel entertainment. Selling anything directly through these networks or steering traffic for commercial reasons might destroy the delicate balance of trust and usefulness, so owners of social networks need to develop strategies based on principles other than plain advertising. As the ecosystem of microblogging is volatile, the choice for one particular revenue strategy likely has consequences for the site's number of users, its user demographics and user behaviour.

Over the years, Twitter has always been extremely cautious in selecting (a combination of) revenue models, to avoid antagonizing its customers. A number of suggestions for monetizing Twitter were made by strategists and analysts, including offering various subscription levels, service fees, revenue fees, search deals (the Google model), sponsored content and selling meta-data. Until 2009, Twitter appeared mostly concerned with business models that involved generating service fees or revenue fees. The company gave away (meta)data and technical secrets to outside programmers who developed applications; they watched as outside programmers and start-ups developed interesting monetizing services and tested them in the marketplace, sometimes buying them back or making deals to split the revenue (Miller 2010a). For instance, CoTweet, a San Francisco-based start-up, successfully developed services to manage large companies' Twitter accounts (e.g. Coco Cola) by tracking interactions with customers and letting employees respond.

.In recent years, though, Twitter has become more active in pursuing other, more commercial, revenue sources. For one thing, the company sold the rights to include Twitter posts in search results to Google and Microsoft in 2009. In the spring and summer of 2010, other steps in Twitter's slow-rolling business model could be observed: the site launched @earlybird Exclusive Offers, offering followers time-sensitive deals on products and events from sponsors. Another new feature was called 'points of interest': Twitterers automatically reveal where they are, so people will be able to search for a certain location, like a market square or a concert hall, and view all the posts written from that spot. Earlier that year, Twitter bought up Summize, a successful start-up that exploits search engines linked to geo-location systems. By adopting these new features, Twitter paved the way to include sponsored content – push-based, pull-based or geo-based – next to Twitter messages. Indeed, almost immediately, the company introduced Promoted Tweets and Promoted Trends, a service linking keywords to advertisers in order to insert promoted tweets into the stream of real-time conversation (Miller 2010b).[11] The gradual incorporation of Promoted Tweets and Trends into Twitter's search results and customized feeds signalled a definite shift towards push-based sponsored content – a test bed that will be monitored closely by other social media platforms.</IP>

<IP>Management experts who compare revenue models of various social networking sites have argued that the largest possible user base is crucial to the site's sustained profitability (Enders, Hungenberg, Denker et al. 2008). Some economists, though, advocate a discovery-driven approach, favouring business models that are developed gradually; McGrath (2009), for instance, emphasizes the centrality of controlled experimentation. Twitter's strategy in its first stage may reflect a combination of both models. In 2010, as the need for generating revenue became more pressing, the company introduced several distinct changes in its business model, reflecting a shift from revenue and fee raising to sponsored content. Twitter rolled out these changes gradually because every choice in business model involves

the risk of losing users: if users resent promoted tweets in their personal content stream, they may instantly quit Twitter. If we interpret these changes in relation to Twitter's gradual modifications in hardware and interface features, as well as to its profound shift in user addressing modes and tweet content, we have to conclude that business models, too, actively shape a technology's meaning. Twitter's pursuit of reaching a large, worldwide user base prompted the modification of its hardware to become interchangeable with other global platforms; changing its interface to promote follower lists in turn accommodated the insertion of sponsored content. Through the insertion of geo-based tracking features, users could be monitored more precisely; hence, certain revenue options became more viable. In other words, the site's technology, usage, content and business strategies mutually affected microblogging as a process and product.[12]

Conclusion

For Twitter, the shift from being primarily a conversational communication tool to being a global, ad-supported followers tool took place in a relatively short time span. This shift did not simply result from the owner's choice for a distinct business model or from the company's decision to change hardware features. Instead, the proliferation of Twitter as a tool has been a complex process in which technological adjustments are intricately intertwined with changes in user base, transformations of content and choices for revenue models. By tracking the interpretative flexibility of microblogging in its first five years, I have tried to sketch a multifaceted picture of how a new technology develops in close connection to its usage and interface design, content and the larger socio-economic matrix from which it arises. Tracing this process opens up new perspectives on the dynamics between the various human and non-human actors involved in the development of an Internet service, and thus on the power relationships at stake in a networked environment.

In 2011, the meaning of microblogging is still flexible but less so than five years ago. Although Twitter still supports a number of uses, in recent years it has proliferated most distinctly as a 'followers-listing tool' for frequent news and entertainment updates. Whether Twitter will retain its capability for two-way communication for collaboration in small groups and restricted circles remains to be seen. Twitter has conquered a leading position as a brand name, rendering the verb 'twittering' almost synonymous with microblogging. The platform's integration in virtually every major social media environment, such as Facebook, as well as in 'old media' proves its success as an autonomous brand but also attests to its increasingly 'appliancized' nature. Twitter's integration of push-based and geo-based features in its software may predict a definite choice for sponsored content as its preferred revenue model, but any eventual selection of a business strategy will depend on the loyalty of user bases. In that respect, Twitter's meaning has not stabilized yet. Every subtle change in the platform's hardware, software or business model may affect its users' behaviour as well as the impact of tweets as communicative content. By the same token, changes in the Internet environment – e.g. the introduction of new services or modifications of competing platforms – may instantly affect Twitter's significance and status as the world's leading microblogging platform. Whatever the outcome of future processes, they will be contingent on the mutual shaping of technology, users/usage, content and economic factors.

The concept of interpretative flexibility enabled an analysis of Twitter as an emerging technological playground where the sociocultural meaning of microblogging as a mediated social practice is contested and shaped by various interests. When adopting this concept from social constructivists, I did not contend that a technological object invites multiple points of view from owners or users. Some theorists have preferred terms like 'co-creation' or 'collaborative enterprise' to describe how owners and users of Web 2.0 platforms are equally engaged in defining a tool's development (Tencati and Zsolnai 2008). Contrastingly, the concept of interpretative flexibility assumes this process to be one of struggle and competition

rather than the result of a collective effort towards finding a stabilized meaning for a tool. In other words, a stable meaning is the very *stake* in a battle for signification. Twitter's meaning as a tool and service will be as much the result of conscious steering by its owners as of accepting and/or resisting such steering by users, researchers, journalists, business analysts and others. The outcome of this process is never gratuitous or contingent: at stake in this battle is the *shaping of our very channels for communication*. While the Internet is still in flux, every newly launched tool is a contested object that gets moulded by the larger political, economic and social forces in our societies (Castells, 2010). Since the connections between actors (hardware and software, usage, content and business models) remain largely invisible, it is therefore important to demonstrate how specific technologies and services gradually permeate our social fabric and patterns of social interaction and how power relationships in communication networks are constructed and maintained.

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N O T E S

[1] For an update on the latest Twitter figures, both in the United States and worldwide, see http://www.quantcast.com/twitter.com#summary, last checked 17 April 2011.

[2] http://en.wikipedia.org/wiki/Twitter#cite_note-72, checked on 14 August 2010.

[3] Jay Bolter and Richard Grusin (1999: 55) have called this phenomenon 'remediation', arguing that this concept offers us a means of interpreting the work of earlier media as well.

[4] Note that this selection was made on the basis of *modes of addressing* rather than on the tool's actual use by

[4] Note that this selection was made on the basis of *modes of addressing* rather than on the tool's actual use by actual users, as examined by a number of sociologists. The concept of interpretative flexibility, in contrast to more sociological approaches, encourages to look at actors traceable in the technology itself, and the way usage is *scripted* through for instance hardware and software (Akrich 1992). Specific social uses of Twitter, such as the branding of the self (Marwick and boyd 2011) or the organization of political activism (Morozov 2011), are sociologists' object of research, yet they can easily be categorized into these more abstract categories of usage.

[5] Evan Williams, one of Twitter's co-founders and chief executives, said in an interview with the *New York Times*:

<EXT>Many people use it for professional purposes – keeping connected with industry contacts and following news. […] Because it's a one-to-many network and most of the content is public, it works for this better than a social network that's optimized for friend communication. <SRC>(Miller 2009a)</SRC></EXT>

[6] The considerable drift towards popular Twitter lists and their following is underscored by public rankings of 'The Top 100 Twitterholics based on followers' (http://twitterholic.com/).

[7] According to a statistical analysis of some 300,000 Twitter users in 2009, Harvard researchers Heil and Piskorski found that men comprise a minority of users (45 per cent) while they have 15 per cent more 'followers' than women and they also have more reciprocated relationships. Both men and women are more likely to follow men than women; in fact, an average man is 40 per cent more likely to be followed by a man than by a woman, while both tweet at the same rate. This gender division is unlike other social network sites, where most of the activity is 'focused around women and where men follow content produced by women they do and do not know, and women follow content produced by women they know' (Heil and Piskorski 2009: no page numbers)

[8] Alan Rusbridger, editor-in-chief of *The Guardian*, explains why Twitter has become an indispensable news source for journalists by listing fifteen features (Rusbridger 2010).

[9] Since 2006, Twitter has relied primarily on investments from investors like Fred Wilson, a vice-chairman and principal of Union Square Ventures. In a 2010 round of funding, six investors, including T. Rowe Price (TROW), Insight Venture Partners in New York and Spark Capital in Boston, reportedly pumped $100 million into the company.

[10] Rumours of Twitter's impending takeover by Google and Facebook, in early 2011, were quickly denied by the site's owners. See, for instance, Neate (2011).

[11] Promoted Tweets and Promoted Trends work as follows: if you look at the right side of users' Twitter feeds, one 'promoted trend' is added to the traditional top ten of most popular tweeted topics. By adding a paid-for eleventh trend to the list – for instance Disney-Pixar's most recent movie title – the sponsor hopes the item will rise up the list.

[12] The interdependence of technology, use, content and business strategy also surfaces in specific national implementations of Twitter. For instance, when Japanese cell phone carrier Softbank announced the inclusion of Twitter in the interface design of its new handsets, Twitter's owners predicted a big boost to their service in Japan (Tabuchi 2010). This prediction was based on three factors related to Japanese context: the popularity of the cell phone in everyday communication, the Japanese herd mentality when it comes to following celebrities and politicians, and the compact nature of the Japanese script, which befits the nature of Twitter's messages.</EN>