Flickr and the culture of connectivity: sharing views, experiences, memories

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Flickr and the culture of connectivity: Sharing views, experiences, memories

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Abstract

Photo sharing sites such as Flickr are commonly regarded either as spaces where communal views and experiences evolve as a result of picture exchange, or as visual archives where sharing pictures in the present naturally leads to a collective interpretation of the past. This article proposes regarding Flickr as a social media platform annex database that enables the construction of infinite connections. Platforms such as Flickr are firmly embedded in a culture of connectivity, a culture where the powerful structures of social networking sites are gradually penetrating the core of our daily routines and practices. What is often called 'collective memory' or 'cultural heritage' in relation to digital photo sharing sites is largely the result of data linked up by means of computer code and institutional protocols.

Introduction

'Share your photos. Watch the world' is the motto featured on Flickr, currently the world's largest photo sharing website.[1] While Flickr was initially regarded mostly as a photo repository, it has quickly grown into a social network site the value of which hinges on interaction, dynamic exchange and a constant stream of added pictures. As a social network, Flickr's design allows users to upload photos by email, mobile phone or through the web, disseminate pictures through RSS or blogs, comment on postings, join groups, declare friends, click on favorite photos, and so on. As a photo repository, the site is a constantly evolving database, which never fossilizes into a stable archive. Less visible is Flickr's function as a source of information on user interactions; over the six years of its existence, many application programming interfaces (APIs) have been developed using Flickr as a database.[2]

Flickr's motto suggests the website links single photographic contributions to a naturalized, common view of the world. Behind this appealing slogan lie three assumptions that I would like to take issue with: the notion that sharing photos leads to *collective perspectives*, *experiences* and *memory*. First, the word 'sharing' connotes the idea of exchanging views to achieve an agreed upon

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viewpoint; through the accumulation of individually uploaded images a joint perspective on the world emerges. Second, the motto hints that sharing pictures leads to a collective experience. Individuals articulate their identities as social beings by uploading photographs to document their lives; they appear to become part of a social community through photographic exchanges and this, in turn, shapes how they watch the world. The third assumption underpinning its slogan is that Flickr functions as collective memory. The platform invites users to contribute photos, comments and information that then translate into a collective view on past events – the world as it was or a cultural heritage collection.

When it comes to digital platforms such as Flickr, we may question the appropriateness of the term 'collective' in relation to perspectives, experiences and memory. In the next section, I will take up Andrew Hoskins's argument that the idea of collective memory has become problematic in the age of digital networks (Hoskins, 2009). The traditional idea of collective memory is generally grounded in the presumption that the individual and the collective are separate entities that are associated *through* technological mechanisms, such as media, and *through* social institutions, such as archives. However, the formation of memory is increasingly structured *by* digital networks, and memory's constituting agency is both technological and human. Hoskins introduces the terms 'networked' and 'connective' memory to account for the construction of a new kind of memory that mixes not only the individual and the collective, the private and the public, but also past and future past into a permanent stream of visual 'present'.

In the subsequent sections, I will expand Hoskins' theory on connective memory as part of a more general *culture of connectivity* – a culture where perspectives, expressions, experiences and productions are increasingly mediated by social media sites. The culture of connectivity manifests itself particularly through platforms such as YouTube, MySpace, Facebook Twitter, and others. Here I will concentrate on Flickr – its interface, algorithm and database – as well as to APIs built on the website. My point is that Flickr does not simply enable but actively *constructs* connections between perspectives, experiences and memories. The idea of 'sharing' presumes a conscious, human activity, whereas in the context of social media platforms it has become mostly an unconscious technological pursuit. What is often called 'collective memory' or 'cultural heritage' in relation to digital photo sharing sites is largely the result of visual data and metadata linked up by means of computer code and institutional protocols. While Flickr's motto appears firmly rooted in singular notions of human collectivity, this article, by means of counterpoint, explores how the site is thoroughly structured by entwined human–machine interactions. Analyzing Flickr as a particular manifestation of the culture of connectivity may offer a comprehensive framework to understand how the 'sharing' of pictures leads to specific ways of 'watching the world'.

The connective turn and the culture of connectivity

Social media platforms such as Flickr are often promoted as a 'collective effort' where users engage in relationships and through which they establish communal experiences, resulting in collective memories. But what does this term 'collective' refer to? Cultural practices, such as the sharing and preservation of (analogue) photographs, have long been the focal point of research into individual and collective memory. As technologies of memory changed over the decades, so did theories of memory. For instance, Van House and Churchill (2008: 296) observe: 'What is remembered individually and collectively depends in part on technologies of memory and the associated sociotechnical practices, which are changing radically.' Recent theories re-examine the tight interlocking of memory and media, typically linking collective memory with mass media and individual memory with so-called 'personal' media. Since the emergence of digital platforms, memory is increasingly

defined by networked computers, which are in turn deployed by institutions or companies who (professionally) manage memory practices. Andrew Hoskins (2009) coins the term 'networked memory' to account for the intricate tension between individual expressions and collective memory in networked digital environments. He describes this relationship as follows:

> [C]ontemporary memory is thoroughly interpenetrated by a *technological unconscious* in that there occurs a co-evolution of memory and technology. Memory is readily and dynamically configured through our digital practices and the *connectivity* of our networks. … The increasingly digital networking of memory not only functions in *a continuous present* but is also a distinctive shaper of a new mediatised age of memory. (Hoskins, 2009: 96, emphases added)

Three concepts included in Hoskins's description of networked memory are important for this argument and will be elaborated upon in this section: the notion of a technological unconscious; connectivity versus collectivity; and the continuous present of mediatized memory.

The 'technological unconscious' is an important condition of new memory: it refers to the increasingly powerful digital environments that are operated without the knowledge of those who use these environments and upon whom they are taking an affect. To some extent, users are aware of what a technology does and how it works; users understand the basic operation of a platform from its interface features, which let them consciously deploy advanced technology to suit their (social) purposes. The technological unconscious, however, is a powerful steering agency that not simply facilities human activity but actually constitutes it. What David Beer (2009) calls the 'power of the algorithm' could be considered the core of the technological unconscious. Algorithms help connect and interpret users' metadata to reveal behavioral patterns, which in turn can be used to actually steer users' behavior by adjusting the interface. Users have little knowledge of how such underlying 'performative infrastructures' (Thrift, 2005: 224) work, which is not surprising if we look at most platforms' lack of transparency when it comes to their policies vis-á-vis the use of metadata.

In addition to recognizing the technological unconscious as a significant power in contemporary networked memory, Hoskins also introduces 'connective' as an antipode to 'collective'. The term 'collective' or 'collectivity', in relation to human memory, commonly takes on both a sociological and a historical meaning (Assmann and Czaplicka, 1995; Halbwachs, 1992). In a sociological sense of the term, collective memory means people experience a connection between what happens in general and how they are involved as individuals; in a historical or historiographical sense, it means that people somehow feel part of a communal past or ordering of that past (van Dijck, 2007: 10). The historical specifics of the debate on the relation between individual and collective memory are very interesting, but not immediately relevant to the point I am trying to make. Most relevant to my argument is the observation that notions of the 'collective' are grounded exclusively in anthropocentric terms: collective memory is the result of individual minds meeting one way or another. By contrast, networked memory requires a new understanding of agency where minds and technics are intertwined. In his forthcoming work, Hoskins goes one step further and declares the end of collective memory as a useful conceptual gateway to the digitized present because the very basis of future memory has been transformed; he proposes the terms 'connective' and 'connectivity', thus replacing an anthropocentric approach by a socio-technical one, which is needed to comprehensively assess digital practices in a networked environment. By introducing the 'connective turn,' he does not mean to build bridges between bipolar entities such as individual and collective or private and public. Instead, he proposes to reinvent the very meaning of concepts such as memory *in terms of* connectivity. The continuous presence of the network – both in its human-centred sociological

and historical meaning and in terms of its technological apparatus – substantially changes the definition of what counts as memory and experience.

Definitions of memory and experience are inextricably linked up with notions of place and time, notions that obviously affect our memories. As memories are increasingly mediated and thus constructed by networked technologies, the boundaries between present and past are no longer given, but they are the very stakes in debating what counts as memory. Memory after the connective turn, in Hoskins's view, is a new mediatized memory that challenges currently dominant concepts of time and space, which are generally still grounded in bipolar distinctions:

> Thus, the idea of active memory equating to the preservation of 'the past as present' and passive memory as the preservation of 'the past as past' fails to address the function of the continuous present of the networked Web and other digital media through which memory and technology co-evolve including the co-existing of previously more distinct modes of cultural memory, for instance: 'the private' and 'the public'. (Hoskins 2009: 101)

The 'continuous present' of the World-Wide Web manifests itself in the constant connectivity of people and digital networks. People do not generate memories by means of networked platforms, but the dynamic of connection constitutes memory's very condition. Therefore, any memorizing activity takes place in the current flow of contacts between people and machines and cannot be the result of *either* an individual *or* collective reminiscence.

I would like to take up Hoskins's concept and expand it from the specifics of memory to what I call the 'culture of connectivity' – a post-broadcast, networked culture where social interactions and cultural products are inseparably enmeshed in technological (and legal-economic) systems. The aforementioned three concepts – the technological unconscious, connectivity instead of collectivity and the continuous present of the mediatized age – are significant keys to understanding the 'performative infrastructure' of this culture. We can distinguish two major theoretical approaches to the culture of connectivity. Drawing on the constructivist idea of socio-technical ensembles, we may analyze the *social shaping of technology* and regard Web 2.0 platforms as mediators – rather than intermediaries – of social action (Latour, 2005). Drawing on the concept of 'affordances', we may study the *technological shaping of sociality* as both constraining and enabling materialities, and regard Web 2.0 platforms as nodes of interactions and relations (Hutchby, 2001). These approaches are not contradictory; in fact, they may even be complementary in explaining the processes of connecting information to people, technologies, institutions, computer systems and behavioral patterns. Many of these processes are invisible to users or are not perceived consciously. Especially if we look at the interface design and applications of specific Web 2.0 platforms, such as Flickr, it becomes possible to illustrate the intricate co-evolution of sociality and technicity (Niederer and van Dijck, 2010).

The culture of connectivity comprises networks of multiple dyadic and technological relations that define and redefine not only the nature of memory, but also the way our perspectives and experiences are formed. Embroidering on Hoskins's concept, I want to show how essential the notion of connectivity has become to our understanding of culture – especially photographic or visual culture – and of cultural practices – particularly archiving photographs as 'cultural heritage'. As I will argue, the anthropocentric notion of collectivity is often naively transferred onto digital practices, even if the conditions for communication and preservation have substantially changed. In the next three sections, I will analyze Flickr as a specific example of how 'collective' views, experiences and memory can be accounted for in terms of connectivity.

Flickr as a platform for connecting views

According to Flickr's motto, its function as a social media platform is to collect individual 'views' – quite literally, shots taken from one person's camera – and to bring about shared perspectives or common viewpoints. Flickr assembles thousands of photos uploaded by individuals on its website by virtue of an interface design that visibly and invisibly channels user activities. For one thing, Flickr has its own search function, a helpful tool to find like-minded people and interesting pictures. Most information for the search function comes from tags or profiling information consciously submitted by members, thus enabling users to find images related to particular topics, such as people's names, places or subject matter. Tags can be searched alphabetically or by popularity, as can all words provided in the comment sections. Flickr was also one of the first sites to implement tag clouds – a visual depiction of user-generated tags, which can be categorized alphabetically or by importance (indicated by font size or color).

Besides its many visible features, the site also has a number of features that belong to the realm of the 'technological unconscious' – features that are less easily recognized as socio-technical directives, but that are instrumental in Flickr's ability to gather metadata on users' preferences, theme choices or mode of interaction. In order to find meaningful patterns of social activity triggered by picture sharing, metadata are ordered and interpreted by information scientists and statisticians. Some APIs developed by academics are used, for instance, to develop sophisticated search engines for image recognition, while some advanced applications aim at measuring the intensity of cross-linking between users in order to study social interaction (Mislove et al., 2008). Statistical analysis on large image repositories can reveal distinctive patterns of individual and collective behavior. For instance, Swiss researchers Negoescu and Gatica-Perez (2008) found distinctive patterns of photo-to-group sharing practices, such as group loyalty, degree of active participation and group affiliation. Aggregated content and metadata may thus offer insights into large-scale behavioral trends (who shares pictures with whom and how often?), as well as into characterizing relations between users by means of preferred content (who shares pictures of dogs?). Flickr's free metadata are a bounty to data miners who are interested in classifying user preferences and affiliations, and in finding statistical correlations between patterns of use and visual content. Even if a Flickr user's profile remains private, links to groups and group affiliation are visible to the public, because Flickr does not allow users to hide their group memberships (Zheleva and Getoor, 2009).

Flickr's metadata and statistical analyses are not simply meant to *track* users' preferences, but this information may be used in turn to *stimulate* users into engaging in particular group behavior or group formation. By analyzing metadata, commercial and government organizations can take advantage of a social network such as Flickr to distillate and predict user characteristics. Flickr itself exploits information derived from cross-referencing and tagging through selective placement of ads next to searched content. For instance, if you search for 'recovering addicts' in the Flickr database, you find pictures posted by random contributors spread across a large number of groups who are identified by self-added tags or by visual features. The advertisement showing up next to the results page – my first attempt revealed an ad for Glenlivet Single Malt whiskey – may be coincidental, or may be the result of automated connections between pictures and profile data, generated by Flickr algorithms. Search algorithms for tagged metadata can yield information that was never meant to be revealed, but that results from automated connectivity signals between tags and visual content (Lerman and Jones, 2007). In much the same way as Amazon's recommendation system steers individual buyers' appetites, APIs built to mine Flickr's visual content and metadata allow researchers to extract profiles. Information derived from these data analyses may in turn be

used to develop algorithms that provide automated personal recommendations featured by the website's 'explore' button.

Some researchers have lauded Flickr's potential as a platform for individuals to develop and shape their aesthetic norms and discuss their personal inclinations to discover common taste (Murray, 2008). In this vision, platforms such as Flickr are mainly facilitators for human interaction. However, the exclusive emphasis on human interaction and collaboration eclipses the role of automated algorithms in the production of social norms (whether aesthetic, ethical or intellectual) by systems such as Flickr. People spend energy on managing and cultivating their social networks online, and in doing so, they unconsciously release profiling information on what they like, whom they relate to and for what purposes. Combining tag-based, location-based and visual content-based analysis in mining the Flickr repository, researchers Huang and Hsu (2006), for instance, are able to reconstruct 'personal social networks' by connecting five types of data: people pictured in the photos, events tagged, time stamp, location and ownership of the upload. A personal network indicates a social structure between actors, either individuals or organizations, through various social bonds, which can be any kind of relationship (kinship, social, professional, affective), a material exchange, a common behavior, etc. For instance, a person showing up in an x number of pictures at close distance to two other persons, showing up in the same location, or sharing a pattern of browsing behavior with a number of other users, betrays much about his or her social kinships. As Huang and Hsu (2006) conclude: 'The digital imaging revolution has not only changed our personal experience in photography but also offered *a new perspective on our social life*.' In other words, by tracking shared information between people, events, activity, expressed interests and locations in time, patterns of social interaction are not merely reconstructions but active constructions of social behavior shaped by the 'technological unconscious'.

While some information is added manually by users, data concerning the where and when of pictures are increasingly derived automatically from uploads. Flickr's homepage boasts over 90 million 'geotags': location data transmitted by default from location-aware camera phones and digital cameras. Geotags enable a social dynamics based on geographical proximity called 'geosocial networking'; users may choose interactions relative to location and time and Flickr's interface can be deployed to visualize users interactions. The inclusion of geotags in Flickr's database has triggered the development of a score of new application programming interfaces. Kennedy et al. (2007) analyzed Flickr's geodata to generate aggregate knowledge in the form of 'representative tags' for specific areas in the world. Combining information from visual content (what is shown in the picture) to location data as well as to user-added tags, they automatically identify clusters of images of, for instance, the Golden Gate Bridge and other landmarks in the San Francisco Bay area. These researchers' main goal is to analyze, extract, and interpret patterns from random user-generated data – visual content, tagged and location data – in order to 'enhance … our understanding of the world' (Kennedy et al. 2007: 631). A conclusion like this reiterates the 'collectivist' paradigm underlying the Flickr website: if we all share pictures about one topic or place, a collective view of this object naturally emerges.

With photo sharing systems such as Flickr, a new regime for *shaping* views has emerged: 'sharing pictures' means the site mediates the construction and interpretation of connective knowledge. Collecting and connecting data are equally important functions. Thousands of people consciously upload pictures to social media platforms and link up to others, hence feeding the 'technological unconscious'. The power of the algorithm defines how pictorial and other data are interpreted to yield patterns of judgment or shared perspectives, which may subsequently be used to steer the user. Flickr is not just a neutral information system; it is value laden and plays a role in determining

the wider social and cultural order of information. In more than one way, Flickr has become an instrument to shape common views of the world. As such, photo sharing sites appear to fall between 'an information system that might be understood within the paradigms of information studies and a mass medium that can be approached by methods prevalent within media or cultural studies' (Cox et al., 2008). This observation leads us to raise the question of whether and how Flickr and similar platforms also shape what is commonly called 'collective experiences'.

Flickr as connective experience

'Flickr is an amazing community with sharing at its heart', as the homepage of this site puts it in self-affirmative terms (see Flickr, n.d. d). This secondary motto refers to the supposed function of Flickr as a platform for shared experience and community building – two activities that go hand in hand. The motto conjures up images of active communities who upload, download and comment on pictures and, by doing so, turn their activity into a collective experience. Notions such as 'sharing pictures' are used interchangeably with 'sharing experiences' and are often mentioned in one and the same breath as 'telling (life) stories'. For instance, information scientists Huang and Hsu (2006) argue: 'While doing experience sharing, photos are indeed the most popular and convenient media we use today to translate daily happenings and tell life stories'. Not surprisingly, the idea of sharing photographs as a community-based social activity is firmly rooted in analogue practices of photography. Until the 1990s, sharing laminated pictures (and stories) was indeed a shared social experience conducted commonly within the social circles of family and friends. Very few pictures were actively exchanged beyond those private circles, but this changed as soon as digital cameras penetrated the markets of amateur photography (Pauwels, 2008). Since the emergence of photo sharing sites such as Flickr, electronic platforms by default encourage the exchange of personal pictures with strangers. Prieur et al. (2008) tout this transformation as a change from a 'Kodak culture' to a 'Snaprs culture' where the former refers to a small group of persons (friends and family) sharing oral stories *around* or *about* images, and the latter refers to photos used to tell stories *with* images to anonymous audiences.

The anthropocentric concept of sharing photographs as a collective community experience is smoothly transposed to the digital age where it translates into interface features. The formation of groups, for instance, is a prominent feature on Flickr. Its website's overall design strongly favours group activity as we can read on its starting page: 'Groups are a fabulous way to share content and conversation, either privately or with the world. Believe us when we say there's probably a group for everyone, but if you can't find one you like, feel free to start your own' (see Flickr, n.d. b). Flickr groups can either be public (open to all), semi-public (invite only) or completely private, and every group is a discussion board for talking with members. Groups offer space for many-to-many contacts, and almost half of all Flickr Pro users participate in at least one group.[3] A group's initiator automatically becomes the host of a pool of photos posted by users who have joined the group, as well as the administrator of the accompanying discussion forum. Groups on Flickr are formed around social or thematic principles: they may be centred on someone (John's pictures) or something (pictures of San Francisco, desert flowers, recycling practices, etc). People consciously form groups to share ideas or aesthetics, or simply because they are interested in someone's photographic work or comments. The comment function is an important aspect of developing community bonds, particularly in building a shared aesthetic judgment; by exchanging photos and comments, Flickr's functionality as a communication device facilitates the construction of narratives about our selves. As Murray (2008: 149) concludes 'Flickr has become a collaborative experience: a shared

display of memory, taste, history, signifiers of identity, collection, daily life and judgment.' Murray, like most researchers, presumes the primacy of human collaboration and collective experience and pays scant attention to the mechanical forces that steer connections in digital photo sites.

We can notice a similar assumption of shared individual pictures giving rise to a 'collective experience' in applications built on the basis of Flickr. Photosynth, now a widely available software package, was developed in 2007 by Microsoft engineers using Flickr as its testing ground. The software has the capability of taking a wide variety of images from a database, automatically analyzing them for similarities, and stitching them together into a smooth three-dimensional space that can be viewed from multiple angles, endlessly zooming in and out, thus enabling detailed looks and bird-eye's views.[4] Thousands of pictures of the Arc de Triomphe, Notre Dame and the Golden Gate Bridge are uploaded on Flickr; each of these pictures is either voluntarily or automatically enriched by a variety of metadata (e.g. added tags and comments vis-à-vis time stamps and geotags, source information etc). Computer programs such as Photosynth allow the recovering of higher-level information from the spatial distribution of photos, such as tourist sites or landmarks, mechanically selecting suitable images to be stitched together into homogenized 3D viewpoints.

Photosynth is a helpful tool to create 'ideal' enhanced images out of set of available shots, but computer scientists involved in the development of this software appear to affix much higher goals to their technological pursuit. Some information scientists predict this kind of 3D imaging may have significant impact on education, science, commerce (tourism) and everyday life; they argue that new knowledge about geographical sites or cultural heritage is created out of thousands of pictures taken by individuals and repurposed to form our 'common knowledge' of the world's popular places and cultural treasures (Snavely et al., 2008). Another example is provided by a webcast TED-talk in which Microsoft engineer Blaise Aguera y Arcas commends Photosynth's potential to take data 'from our social environment' and make something emergent that is 'greater than the sum of its parts' and that 'grows in complexity as people use it.'[5] Photos tagged by numerous uploaders and retrieved by Photosynth software, according to Aguera y Arcas, result in a 'cross-model, cross-user experience' – a model of every interesting part of the world 'collected not only from flights but also ... from the collective memory.'

Once again, we may notice how a technological framework largely based on algorithmic connections is explained almost exclusively in terms of human collectivity and interaction. The conjecture of individual pictures resulting in collective experiences raises several objections. First of all, the assumption that 'cross-model experiences' are the sum total of individual takes is fallacious: the sum of individual camera shoots has nothing to do with the 'experiences' of people taking these pictures. Second, the idea of Photosynth enabling a 'cross-user experience' is equally overstated, because there is no such thing as a shared social activity arising out of the mechanical stitching of millions of photographs. The convergence of imagery from different individual sources lies in the interface that strategically selects and combines useful images from a database, linking them according to semantic, geometric or perspectivist principles. 'Cross model, cross-user experience' are thus terms rooted in automated connectivity, not human collectivity. Finally, one could argue that Photosynth software does not render a (3D) photographic *representation* of an object or place, but a (re)construction or model that can no longer be called a photograph. Marsh (2009) has coined the term 'phototrix' to describe the result of Photosynth: a digital artifact assembled from uploaded images, filtered through algorithms and automated processing mechanisms.

Flickr, by virtue of its technological design, which privileges many-to-many exchange, foregrounds the site's experiential and social functions – functions that are primed in algorithms. In contrast to what Aguera y Arca suggests by using the term 'collective memory', Photosynth is not

the outcome of a process of negotiating various views, but is the result of a process of manipulating individual takes into an artificial 'consensual' perspective. For this reason, Photosynth software is not a mediation of collective experience or perspective but a tool to create homogenized views. Not coincidentally, Photosynth, just like Adobe Photoshop, may be used to *doctor* photographic representations of public events that may in turn *affect* the way we experience or watch the world (Sacchi et al., 2007). The prefix 'collective' is injudiciously deployed to accentuate social-human activity involved in sites such as Flickr. Here, the term 'connective' would be much more appropriate to indicate the intricate entanglement of technological and human interaction involved in the digital mediation of experiences, perspectives and memory.

Flickr as connective memory

Ever since Flickr's popularity as a photo sharing website exploded in 2006, its function as a picture repository as well as a site for community building has not gone unnoticed by so-called 'memory institutions': archives, libraries and museums. The major role of memory institutions is to 'link the past with the present' and to 'interpret and contextualize cultural heritage for it to become meaningful to people in their present lives' (Manzuch, 2009: 3). In the context of memory institutions, collective memory commonly refers to a shared remembrance of past (public) events, enabled either by individuals sharing memory objects such as pictures or stories with others to enhance social cohesion in communities, or by institutional decisions (e.g. museums, archives) to expose such objects to the public eye. But as Manzuch (2009: 5) points out, memory is not the same as heritage: the distinctive feature of a memory institution is not merely holding a cultural heritage collection, 'but also performing activities that transform heritage into a cultural intermediary of memory'. Digitization projects are regarded as effective tools for engaging users in (the building of) collective memory and as facilitators of cultural heritage collections.

Again, I think the term 'collective' may be an inapt concept for understanding the dynamics of memory in the context of photo sharing sites. For starters, Flickr's function as a depository for uploading pictures is often mistaken for an archive or photo library; yet Flickr is a constantly changing database that lacks even the most elementary principles of an archive's ordering and preservation system. Second, Flickr is not a logical place to nurture interpretations of the past because the site is primed by the *present* – a constant flow of images whose uploading is premeditated by users' motives that vary from aesthetic preference to political conviction. And finally, even if photo sharing sites are not considered mere containers for, or transmitters of, collective memory, their function as tools for engaging users in building cultural heritage collections seems to be overstated while the substantial role of *institutional* mechanisms for selecting, connecting and presenting visual and narrative data is downplayed. Let me illustrate these three misconceptions by looking at some specific features of the Flickr website and one application based on Flickr Commons.

Even if Flickr is seen by some as an archive or a stock image bank, the idea of a *photostream* much better fits the ideology of its design. This functionality can be clearly identified on the Flickr homepage, which prominently features buttons to view 'Interesting photos from the last 7 days' and 'Most recent uploads' as well as an automated teller of 'Uploads in the last minute'. Flickr's default settings and home page are designed to reward recent activity: constant updates and uploads keep up visits to the site, boost traffic and generate interest in current affairs. Nancy Van House (2007: 2719) who conducted in-depth interviews with Flickr users, concludes from her research that most participants 'described their Flickr collections as transitory, ephemeral, "throwaway", a stream, not an archive'. The question of 'what's happening' rather than 'what happened' triggers

the news function of photo sharing sites, and users are encouraged to check the site for its constant feeds and endless streams of new pictures being taken somewhere in the world, reflecting a general cultural value generated by media values about news.

Newsworthiness turns out to be an important functionality of Flickr, promoted in close relation to its self-acclaimed function as a platform for shared experience. The emphasis on recent events has led to the claim that many users 'watch the world' through the eyes of amateur photo journalists who upload their pictures just seconds after they witness an event. Flickr has become a significant forum for eyewitness photography, especially in times of disaster. Groups are created purposefully in response to natural disasters, such as wildfires, hurricanes and earthquakes, or political news events, such as metro bombings or plane hijackings. In their content analysis of disaster-specific Flickr groups, for instance those devoted to the London Transport bombings in 2005 and to the Virginia Tech shooting in 2007, Liu et al. (2008) found that amateur photography is becoming a documentary practice and that Flickr has become a significant podium for amateur photographers to reach a wider public. Yet these groups not only share eyewitness reports, but also swap stories about traumatic events people experienced. Flickr groups, in that respect, have both an informative and a therapeutic function. Consequently, Liu et al. describe Flickr as an *image aggregator* as well as an *experience aggregator*. In contemporary news discourse, photos increasingly serve to communicate experiences – personalized stories illustrated with visual evidence. It is therefore no surprise that news organizations began contacting administrators of Flickr groups to seek permission for using both photos and comments in their news coverage.

One could argue that social platforms such as Flickr reinforce feelings of belonging to a group whose shared experiences of current events shape a collective perception of the world – a so-called 'first draft of history'. And yet, this argument tends to ignore the fact that any perspective collected by the site's users is also substantially shaped by institutional and technological mediators. For instance, when the Iranian elections, in 2009, led to an uprising, sites such as Flickr, YouTube and Twitter were the preferred communication channels for the Iranian resistance. On Flickr, several groups actively published pictures of beatings and protests, which were in turn picked up by western media and broadcast all over the world. However, the role of Flickr – and for that matter, Twitter or YouTube – was less to organize Iranian protesters than to feed traditional news channels with images and stories. The use of Flickr has little to do with collectivity – communities sharing a shared sense of experiencing current affairs – but everything with global connectivity. Flickr connects personal uploads to group activities, (news) organizations, networked media and worldwide audiences. Visual and verbal eye-witness reports, in this example, are not only filtered by journalistic practices of news selection, but are also steered by the technological and institutional filters of Web 2.0 platforms and news organizations.

The idea of Flickr as collective memory in terms of creating a shared experience of the past seems a corollary to the notion of photo sharing sites spurring a first draft of history. As mentioned earlier in this section, memory institutions consider Flickr an enabler of cultural heritage for communities interested in (building their) shared history. Active participants in photographic communities, many of whom are Flickr users, are increasingly mobilized to contribute to emerging online heritage services such as the European Library, the World Digital Library or the Library of Congress. The Library of Congress selected Flickr Commons as a (non-commercial) venue for sharing historical photographs from their collections with a large number of global users.[6] In January 2008, two collections of historical photographs were made public on Flickr Commons to achieve three goals: to increase awareness and thus improve access by sharing photographs from the Library's visual collections; to gain a better understanding of how social tagging and community

input could benefit the library and users of collections; and to increase 'common knowledge of the past' by adding tags or comments to items from the library's visual collections (Springer et al. 2008). The idea behind this global project is to facilitate a community by having them engage with, and build on, their common cultural heritage. During the first year of the project, dedicated Flickr users actively tagged and commented on the worlds' visual heritage: over 67,000 tags were added by 2500 unique Flickr users, and info on more than 500 photos was verified by the US Library of Congress and moved into the library's permanent records. In a relatively short period, the Library of Congress as well as a number of its counterparts in the western world, managed to draw a group of amateur historians into active heritage building.

While the aims and outcomes of this project are laudable, I am somewhat skeptical about the overstated ambitions and results. Digital projects like these are considered the perfect intermediaries between a sheer infinite number of knowledgeable citizens, who actively participate in Flickr communities, and libraries or archives that are eager to use their 'collective memory' to built cultural heritage collections. The actual number of active participants in this project, however, was not overwhelming. Heritage institutions such as the Library of Congress have always received input from amateur historians to enrich their knowledge of pictorial objects. What is new about the Flickr Commons project is that it draws a wider variety of contributions that are delivered electronically. Yet the most important – and largely invisible – work is performed by a small number of about 20 'power commenters' who take care of connecting specific annotations to vital information sources, such as archives and encyclopedias, as well as by the professional staff of the heritage institution who control the site's input and output, select and promote its content, and connect it to interested audiences (Springer et al., 2008: 25). The euphoric claim that cultural heritage is emerging 'at the click of a mouse' erroneously suggests that information is 'out there' waiting to be collected, and that sites such as Flickr Commons magically turn all uploaded data into knowledge about the past.[7] Such claims ignore the fact that individual uploads only acquire meaning and impact through the connective work of human contributors, networked technologies and institutional protocols (e.g. selection mechanisms) – which are in turn already prefigured by the institution's and project's *modus operandi* for defining what cultural heritage actually is.

In sum, the adjective 'connective' rather than 'collective' much better describes the memory function of photo sharing sites. It is not just the images that configure a communal view of the past, but the connective work performed on the basis of uploaded data. Historians should be careful to conceptualize digital platforms such as Flickr as archives, because their deployment and interpretation is ultimately contingent upon the connective quality of its mediators, whether human or non-human. In the culture of connectivity, photo sharing sites are practices of memory mediated by social *and* technical protocols (Bowker, 2008; Galloway, 2004). Social protocols include the rules by which we produce data and databases, and how we access and distribute knowledge. Technical protocols refer to automated search algorithms which enable channel sharing activities; these processes are continuously fine-tuned on the basis of information derived from metadata concerning identified patterns of user activity. Flickr Commons never simply yields a collective vision of the past, but at best offers a platform where algorithms, professionals and pro-amateurs select uploaded photos and connect them to groups, interpretations, audiences, institutions, and so on.

Conclusion

Flickr's inviting motto 'Share your pictures. Watch the world', as I have argued in this article, suggests a self-evident transformation from individually uploaded pictures into shared perspectives,

experiences and memories. The word 'sharing', much like the term 'collective', appears to be uncritically transposed from a context defined primarily by social interaction to an environment largely defined by digital platforms. Photo sharing sites tend to be presented either as spaces where communal perspectives and experiences evolve as a result of picture exchange, or as visual archives where the exchange of pictures, experiences and interpretations in the present naturally lead to a communal sense of the past. Photo sharing sites such as Flickr are neither photo exchange sites nor archives, but rather social media platforms based on databases that enable the construction of infinite connections. These platforms are firmly embedded in a culture of connectivity, a culture where the algorithms of social networking sites are gradually penetrating the core of our daily routines and practices, such as sharing photos or exchanging stories about the past.

Photo sharing sites are first and foremost nodes of information and people, where pictures and data are intentionally and mechanically provided; these data are mined to reveal patterns of social exchange, patterns that may in turn be reconnected to information systems that are firmly embedded in institutional practices. In the words of sociologist Bruno Latour (2005: 39), these socio-technological ensembles are *mediators* rather than *intermediaries*. Any stream of uploaded data, then, may be repurposed by (un)consciously provided (meta)data and processed by invisible algorithms and protocols to render new objects, to steer social activity or to affect human behavior. The logic of sharing personal pictures to watch the world hides an ideology of digital platforms being neutral intermediaries between individual and collective views, when they are in fact mediators of social reality. Some recent analyses of Web 2.0 platforms duly recognize their potential to actually shape social practices; for instance, in his analysis of Wikipedia as a global memory place, Pentzold (2009: 264) concludes that the site is 'not only a platform to constitute and store knowledge, but a place where memory – understood as a particular discursive construction – is shaped'. However, whereas Pentzold regards these sites primarily as *discursive* negotiations of *collective* memory, I argued the importance of regarding them as socio-technical, performative infrastructures that channel the connection of views, experiences and memory.

By analyzing *how* photo sharing sites mediate views, experiences and memory, I elaborated Hoskins's theory of the dynamic of connection; concentrating on one specific platform, I have followed David Beer's suggestion to 'understand how the material infrastructures of Web 2.0 play out in the lives of individual users, how the software constrains and enables, how it formulates hierarchies, shapes the things people encounter, and so on' (Beer, 2009: 1000). Flickr, like most other Web 2.0 platforms, enables information analysts to track everyday behavioral patterns and translate them into predictive informational structures. Beyond this one example, I have tried to explain Flickr in the wider context of the culture of connectivity, where platforms such as Twitter, Facebook and YouTube are increasingly penetrating the core of our daily routines and cultural practices, such as catching up with friends or watching videos. We are just beginning to understand the implications of the culture of connectivity through the prism of specific examples, but, of course, the repercussions of widening the scope to include multiple reciprocal connections between various Web 2.0 platforms raises the urgency of this critical exercise. The automated exchange of metadata on user behavior through an infinite number of software applications renders a comprehensive analysis of the culture of connectivity impracticable. It is hoped that focusing on the specific dynamics of one specific photo sharing site helps reveal some of the principles sustaining the fabric of this culture.

What is troublesome in the many superlatives promoting the use of Flickr as a unique platform for sharing experiences and collective memory is their undue emphasis on human interaction – especially the contributions of thousands of anonymous users – and their virtual ignorance of the

connective construction work performed by institutional, professional and technological agents. Grounding Flickr's functionalities almost entirely in motives of human collectivity seriously hampers a critical understanding of how and for what purpose connections between people and ideas are actively constructed. The link between individual views and common knowledge is never the bare result of accumulating data; the relation between a thousand pictures and a global perspective is not as self-evident as many claims imply; and between present experiences and future memories stands a complex structure of technological, social, economic and institutional mechanisms. As it turns out, there is a meaningful gap between the two sentences comprising Flickr's motto. It is precisely the fissure between 'share your pictures' and 'watch the world' that makes you wonder what connects these two imperatives.

Acknowledgments

Notes

1. Flickr was launched in February 2004. The site was developed by Ludicorp, a Vancouver-based company, and was originally created as a tool for a multiplayer online game. In March 2005, Yahoo! acquired Ludicorp and Flickr for a reported 30 million dollars. In 2007, all Flickr members were required to sign up with a Yahoo! ID. Flickr has currently a database of 4 billion photos and 36 million users worldwide. In April 2008, Flickr began to allow paid subscribers to upload videos, limited to 90 seconds in length and 150 MB in size, and in 2009, Flickr added the ability to upload and view high-definition videos (see Flickr, n.d. d). There are a large number of photo sharing sites besides Flickr: Kodak EasyShare, MyAlbum, Photobucket, Picasa, to name just a few.
2. Flickr's owners allow researchers (both academic and commercial) access to its metadata by granting API licenses so that they can create programs or services based on Flickr resources. Flickr's website announces that 'The Flickr API is available for non-commercial use by outside developers. Commercial use is possible by prior arrangement'. For more information on API, see Flickr (n.d. a).
3. Flickr has a bias towards high-degree users who constantly link to other users and who respond to incoming links (Mislove et al., 2008). As Negoescu and Gatica (2008) find in their statistical group analysis, almost 60 percent of Flickr users at least shares one photo in one group, but it is unclear how groups function as an organizing feature for the website. Users can shift photos from a user's photostream to a 'group pool'.
4. Photosynth was co-created by Blaise Aguera y Arcas, who is an architect at Microsoft Live Labs, and architect of Seadragon, a program that computes which parts of which photos are visible on the screen and at what resolution each photo, or part of the photo, is viewed.
5. Aguera y Arcas's remarkable demonstration of the Photosynth software for TED can be viewed on TED's website (TED, n.d.).
6. Purpose of The Commons project is explained on the Flickr website as: 'The key goals of The Commons on Flickr are to firstly show you hidden treasures in the world's public photography archives, and secondly to show how your input and knowledge can help make these collections even richer. You're invited to help describe the photographs you discover in The Commons on Flickr, either by adding tags or leaving comments' (Flickr, n.d. d). Participants include George Eastman House, Library of Congress, Brooklyn Museum, Nationaal Archief, National Archives and Records Administration, State Library of New South Wales, and Smithsonian Institution.
7. Manzuch (2009: 2) refers to visionary statements issued by the European Commission to promote the national library's push for large-scale digitalization projects. See, for instance, Europa (2006, 2010).

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