

MOTIVATIONS FOR IMAGE PUBLISHING AND TAGGING ON FLICKR

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Abstract

Changes in photographic and internet technology have revolutionised the way people create, process and share digital images. This paper investigates people's motivations for image publishing and tagging on the web 2.0 site Flickr. Using an online pilot survey, 33 participants answered questions about their uploading and tagging practices, and whether or not they hope to make a commercial gain from their images. The results show that most people have two main motivational reasons both for using Flickr, and for the tagging of their images. However, whilst a person may be motivated to use Flickr for both personal and social reasons, tagging motivation tends to focus more exclusively on either one or the other of these two factors. Overall it was found that social organisation and social communication are the most popular motivational factors for both using Flickr and for tagging images, suggesting that Flickr is enjoyed for the community environment it provides rather than as a place to store images. However despite people's desire to share their images, most users are not hoping to make a commercial gain from the items they upload.

Keywords: motivations; digital images; tagging; Flickr.

1. Introduction

Advancements in photographic technology have resulted in a renewed interest in the role of the image in fields such as information and computer science, anthropology, economics, sociology and visual studies. Increasing numbers of individuals carry a camera with them every day: either a digital

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camera or a mobile phone with an inbuilt camera. Free from the limitations of a 24/36 exposure film, people are now able to point and click almost endlessly. Coupled with this advancement in photographic technology, there are significant changes in the way the population is using internet technology; the main change being the web 2.0 pronounced emphasis on collaboration and user contribution. Kirk *et al.* [1] point out that 'the traditional role of the user from one as picture "taker", into picture editor, developer and printer' is also contributing to the pervasive photography landscape and this has been supplemented with the development of web 2.0 image sites such as Flickr, PhotoBucket and Picasa. Such sites allow users to upload, store and share images either with selected friends and family or with the public at large. Images uploaded to such sites are generally annotated with 'tags', which are freely chosen keywords [2], assigned by the user, ostensibly to aid with subsequent search and retrieval.

These changes have had a dramatic effect on attitudes towards self presentation and publishing. The Web 2.0 revolution is 'enabling Internet users to author their own content...[a] technology platform [that] will radically democratize culture, build authentic community, [and] create citizen media.' [3] As a result of this influx of user-generated content on the Web, there are some big businesses and organisations which are now looking to take advantage of this new model of creation and authoring. One such example is Getty Images, the world's largest distributor of pictures and videos. Getty joined forces with Flickr in July 2008 and their editors will now be regularly browsing through Flickr for images they like and inviting selected users to become paid contributors to their team of professionals.

However, does Getty's new business model actually complement the desires of Flickr users and their user-generated content? Why do people actually publish images on Flickr and what do they hope to achieve from doing so? This pilot study investigates what motivates individuals to publish their images, what motivates them to tag their images, and whether or not people are seeking to make a commercial gain from the images they publish on Flickr.

2. Related work

Digital images are at the core of Flickr's existence (despite the fact that Flickr's creators originally intended it as an online game [4]). However, Flickr's attraction now lies in its ability to act as both an image storage site and as a

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place for people to share images and cluster in communities of like-minded people in order to converse, share tips and advice on photographic techniques and to gain comments and feedback on photos which have been uploaded. Most of the work to date which has looked at Flickr describe it as a social site and a place for sharing images rather than as a place for merely storing and backing up collections of digital images [5, 6, 7, 8].

Reasons for taking and publishing images

Kindberg *et al.* [9] carried out an in-depth investigation into camera phone use and differentiated between *social* and *individual* intentions behind image capture. In their investigation they found that two thirds of all images taken on camera phones are captured with the intent to share (i.e., taken with *social* intentions). Whilst the nature of taking pictures on a phone may be different to that of using a standard digital camera due to the ease with which images can be sent simultaneously to contacts in the phone's address book, Kindberg also found that the subjects in their study only knew on average eight people who had compatible camera phones who they could actually send images to. Subjects also expressed the intent to permanently save a selection of their images on either a PC, with the subsequent intention to perhaps share certain images with friends via email or by posting onto a webpage.

The traditional reason for taking photographs on a standard camera (whether it be an instamatic, an SLR, or a digital camera) is to document memories and events and to store them so that family, friends and future generations can look back on them. In an investigation into how people manage their collections of photographs, Rodden and Wood [10] found that the organisation of traditional photos requires significant effort, and is not usually done to facilitate searching but to create an attractive 'presentation' of photos for keeping as part of a 'family' or 'personal' archive. Digital organisation on the other hand requires much less effort and is much more likely to be carried out with the intent of sharing the photos and allowing others to view them in the near future.

Cox *et al.* [8] carried out open-ended telephone interviews with 11 Flickr users in an attempt to 'explore the use of the system within the context of the interviewees' photographic practices.' One of the questions which was asked of participants was: 'Why do you use Flickr?' Overall, the interviewees expressed that they used Flickr as, 'part of a wider nexus of self presentation or communication through the web' and their collection of photos on Flickr was, 'usually a selection of the best or most appropriate to be shared.' Flickr itself was also found to be an important motivation for taking photos in the first place.

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Similarly, Van House *et al.* [11] in their interviews and observations with 60 participants found that sharing is an important use of photos on cameraphones, and the authors argue that 'cameraphones will soon be the dominant platform for low end consumer digital imaging.'

Reasons for tagging images

Once images have been placed on the Web, if they are in a Web 2.0 archive then they may be tagged by the owner or others. Tagging is the process of adding keywords to something as a form of metadata. There is much debate concerning whether people tag their resources primarily for personal organisation or to aid in sharing and discovery [5, 6, 12, 13, 14]. Although categorised differently by authors and researchers, these tagging motivations can be largely grouped together to form two distinct bodies of motivational practices: organisational, selfish, personal, intrinsic; and social, altruistic, public, extrinsic, evangelical - or put another way, information management vs information sharing [15, 16].

Marlow *et al.* [6] claim that motivations to tag can be split into two high-level practices: *organisational* and *social*. Organisational motivations are associated with users attempting to develop a personal digital filing system, whereas social motivations are associated with users attempting to express themselves with other users of the system. Hammond *et al.* [12] similarly define these two practices as *selfish* and *altruistic*.

Ames and Naaman [14] extend the notions of *organisational* and *social* in an investigation which explored 'the various factors that people consider when tagging their photos' and the authors offer a taxonomy of tagging motivations based along the two dimensions of: sociality and function. The authors conducted in-depth semi-structured interviews with 13 Flickr users and they found that users generally had one or two primary motivations for tagging their images rather than solely one motivation, and that the motivations could be placed along the dimensions of sociality and function, rather than fitting into a mutually exclusive category (See Table 1.)

The sociality dimension relates to the tag's intended audience (i.e., for oneself, or for others: friends/family/public). The function dimension relates to the actual purpose of the tag (i.e., is it to aid in organisation: placing the image into a category or classifying it somehow according to when/where it was taken or perhaps grouping images into common themes. Or, is it to aid in communication: providing context about the image content, or perhaps tagging it as a way of drawing attention to it from other Flickr users).

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Table 1. A taxonomy of tagging motivations (Ames and Naaman [14])

		Function	
		Organisation	Communication
Sociality	Self	<ul style="list-style-type: none"> • Retrieval, directory • Search 	<ul style="list-style-type: none"> • Context for self • Memory
	Social	<ul style="list-style-type: none"> • Contribution, attention • Ad hoc photo pooling 	<ul style="list-style-type: none"> • Content descriptors • Social signalling

From their findings, the authors suggest that most of the participants were motivated to tag by organisation for others (social organisation), with self organisation (adding tags for later retrieval) and social communication (adding context for friends, family and the public tied for second). This offers a more complex insight into motivation than previous research which has tended to crudely split tagging intention into either a manifestation of organisation for the self, or having the intention to share with others. The work of Ames and Naaman [14] proves that organisational tagging can often be carried out more so for the benefit of others than for the self.

As part of the telephone interviews carried out by Cox *et al.* [8], the authors also asked their participants, 'how do you choose descriptions, tags etc?' They found that a key motivation for tagging was in order to increase the amount of people who could find and view the interviewee's photos.

In a study which looked at whether users of social tagging systems use such platforms for the purposes of personal information management or for information sharing [16], 48 Flickr participants were recruited from the Mechanical Turk service. From qualitative judgements taken from free text comments, these Flickr users showed a strong tendency towards information sharing with friends and family, although personal information management still played a big factor in their motivations. Flickr users also perceived tags as helpful for information retrieval and users often search through image collections other than their own.

In a study into the use of Flickr, Van House [5] interviewed 12 Flickr users and found that most participants saw Flickr as, 'a social site, a place for sharing images...and since they rarely searched back over their own images, tagging was almost exclusively for others.'

The findings of Nov *et al.* [7] and Ames and Naaman [14] indicates that social presence plays a role in tagging behaviour. It could be hypothesised that if people are motivated to use and publish their images on

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Flickr in order to share them with others, then this 'social presence' should motivate them to tag in a way which is socially orientated.

The previous research presented in this paper provides an excellent framework of motivational factors from which to base future studies on. However such research has either analysed Flickr image tags [17, 18, 19]; or motivations to tag [5, 7, 14, 18] and these studies have tended to adopt either a wholly quantitative (tag analysis) or qualitative (open ended in-depth interviews) approach. An investigation combining both qualitative and quantitative methodologies may help us to better understand people's motivations behind image publishing and image tagging, so that conclusions can be drawn about the potential uses of web 2.0 image sites. To date there has been no empirical research which has investigated if users of Flickr wish to make a commercial gain from the images they publish there.

3. Research questions

This pilot study which is part of a programme of research into tagging with Flickr aims to combine a qualitative and quantitative approach via the use of a structured online questionnaire and it aims to directly compare motivation to use Flickr with motivation to tag within Flickr.

Using an information science and webometric approach this research paper addresses the following questions:

- What motivates people to publish their images on Flickr?
- What are the key motivational factors for tagging images?
- Are people seeking to make a commercial gain from the images they publish?

4. Methods

In order to investigate what motivates people to publish and tag their images on Flickr, a pilot questionnaire was developed and administered on the Web to a sample of Flickr users utilising both a direct and indirect approach. This will be followed-up with a larger sample in a future study.

Questionnaire Design

As the target sample for the questionnaire was Flickr users, it was decided that an online questionnaire would be more appropriate than a paper based

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version. The questionnaire was designed using the online survey software and questionnaire tool, surveymonkey.com. Utilising the SurveyMonkey software, a custom designed questionnaire could be created fairly quickly and assigned its own unique URL. In order to try to increase the response rate of the questionnaire and also to make the questionnaire as user friendly as possible, a number of measures were taken:

- The questionnaire was kept short and consisted of only 1 page of questions with minimal scrolling needed
 - A clean, simple and uncluttered layout was used
- The questionnaire was comprised of four main sections:
- A series of question statements relating to a respondent's motivations for tagging their images (using a 5 point Likert scale)
 - A free text box asking respondents to explain why they upload their images to Flickr
 - A question asking if respondents hope that their images will be picked up by a commercial stock photography organisation or the media
 - Demographic questions such as age, gender, and nationality

Question construction, wording and order

Based on the findings from the literature review, motivations for image tagging seem to naturally align with the two dimensions as put forward by Ames and Naaman [14]; the first dimension being *sociality* (relating to whether the tag's intended usage is by the individual or others i.e., self or social) and the second dimension being *function* (referring to a tag's intended uses of either facilitating later organisation and retrieval or to communicate some additional context to viewers of the image). In light of these two prominent dimensions, it was decided that the survey questions relating to motivations for tagging would be based on these two constructs. Therefore four questions were developed, one for each of the two main tagging motivations within each of the two dimensions, thus creating four main possible reasons for tagging. In order to increase reliability, a further set of four questions were then developed which could be paired with the first set. Respondents were asked to express their level of agreement/disagreement with these statements using a 5 point Likert scale.

It was decided that the demographic questions would be placed at the end of the questionnaire as the respondents may be more likely to disclose information such as their age once they had already answered some questions and felt a greater sense of involvement with the questionnaire as a whole. However whereas the motivational statement questions were a compulsory

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aspect of the questionnaire, the demographic questions were not, and a respondent could skip these questions if they felt uncomfortable disclosing such information. The researchers tried to ensure that all questions were worded in a short and concise manner in order to reduce ambiguity

Data collection

In order to try to increase the response rate of the questionnaire, both a direct and an indirect method of data collection were utilised. For the direct approach, the URL of the questionnaire was posted to the discussion forums of two public Flickr groups (*Flickr Social* and *Surveys&Quizzes*). The indirect approach utilised advertising the questionnaire URL on the researchers' Facebook and Twitter profiles, and also on their personal web pages. In all instances, the questionnaire URL was accompanied by a small paragraph of explanatory text, briefly stating the purpose of the questionnaire and advising that all responses would remain confidential and any published results would be anonymised. A URL was also provided which linked to the first author's webpage where further details on the questionnaire and the study as a whole could be found. The questionnaire was available for a period of 3 weeks during March 2010.

5. Results

A total of 33 valid responses to the questionnaire were received. 51.5% of the respondents were female, and the mean average age of the respondent was 30 years. The majority of the respondents originated from the UK and Denmark. See Figure 1 for a full breakdown of nationalities

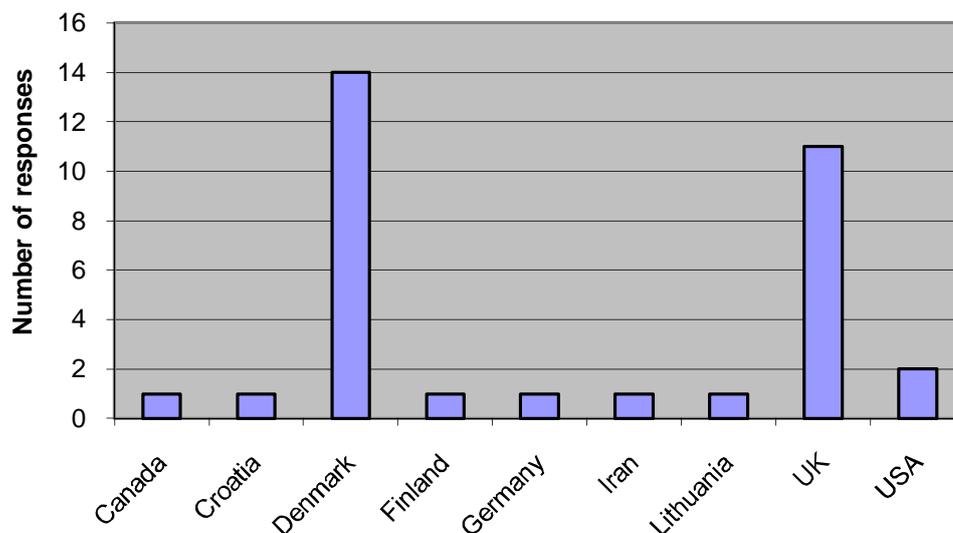


Figure 1. Respondent's country of origin

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Why people upload their images to Flickr

Participants were asked to briefly explain why they upload their images to Flickr. The responses were then broken down into the reasons stated and these reasons were grouped together according to the motivational factors as put forward by Ames and Naaman [14] (i.e., social organisation, social communication, self organisation, self communication).

Most respondents (48%) reported two main reasons behind their use of Flickr, with the two most predominant reasons being to share images with friends and family (social organisation), and to promote their work and connect with other people in the photography community (social communication).

P22: "I use Flickr to promote my creative work, get feedback, and share with friends/family."

P31: "To keep a nicely presented, easily shared record of my photography and to get feedback, encouragement and advice from other users about technique."

45% of respondents reported that they had only one main motivation for using Flickr, and 6.5% reported that they had three main reasons. Figure 2 shows respondent's overall preferences between each of the four main motivational factors.

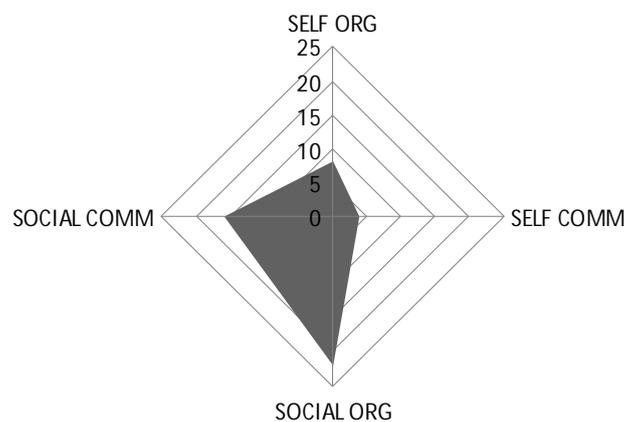


Figure 2. Number of respondents who exhibited each of the four motivational practices

The results support the general consensus that people are drawn to Flickr because of the social aspects and the 'community environment' it provides, rather than using it solely as a place to store and archive images.

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Do people hope to make a commercial gain from their images?

Despite the fact that 51% of the respondents in this investigation specifically mentioned using Flickr as a way of promoting their work and receiving feedback on their images, 75.8% of respondents said that they did not use Flickr with the hope that their images would be picked up by either a commercial stock photography organisation or by the media. So whilst the 'sociality' element is a big factor for many Flickr users, people are predominantly interested in having their images found so that they can gain feedback and encouragement from other Flickr users, rather than hoping their images will be picked up by a commercial agency or the media.

What motivates people to tag their images?

Motivation to tag images slightly differs from people's motivations in using Flickr to publish their images. Whereas people strongly state that social organisation is the main factor in using Flickr, social communication comes out slightly on top in terms of people's motivations for tagging their images (see Figure 3). Social organisation and communication are the top two motivational factors in both instances. This finding differs from the work of Ames and Naaman [14] and Cox *et al.* [8] who found that social organisation was the top motivating factor in tagging practices.

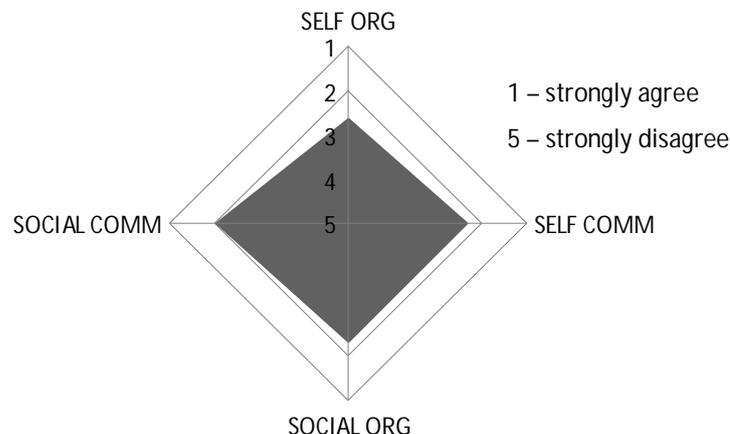


Figure 3. Motivations for tagging images

Similar to the finding which suggests that most people have two main motivations for using and publishing their images on Flickr, most people were also found to have two main motivations for tagging their images (42.4% of respondents).

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Whilst people seem to be primarily drawn to Flickr because of the social function and community environment that it provides, tagging practices don't necessarily follow this primary motivation, with self organisation and self communication reasons appearing as fairly high motivational factors overall. It would seem that people are much more dominantly motivated by the desire to either please themselves or others when it comes to describing and adding context to their images.

Using a Spearman correlation and a Mann-Whitney test it was found that age and gender had no influence on tagging motivation.

Factor analysis

Despite a fairly small sample size, a factor analysis was performed on the survey items relating to the motivational constructs of self, social, organisation and communication. The correlation matrix shows that people gave similar answers to the two survey statements relating to social motivations, suggesting that this was a particularly coherent construct.

Table 2. Factor analysis correlation matrix

		Self1	Self2	Social1	Social2	Comm1	Comm2	Org1	Org2
Correlation	Self1	1.000	.387	-.351	-.514	.253	.265	.168	-.026
	Self2	.387	1.000	-.821	-.654	.162	.044	.095	-.125
	Social1	-.351	-.821	1.000	.622	.037	.085	.043	.165
	Social2	-.514	-.654	.622	1.000	-.077	-.100	-.172	-.162
	Comm1	.253	.162	.037	-.077	1.000	.354	.100	.127
	Comm2	.265	.044	.085	-.100	.354	1.000	.169	.164
	Org1	.168	.095	.043	-.172	.100	.169	1.000	.418
	Org2	-.026	-.125	.165	-.162	.127	.164	.418	1.000

However, the 'social' and 'self' statements tended to pair up with each other, so that someone scoring high on one would tend to score low on the other. This means that there are three main types of motivation rather than the predicted four.

This finding is further corroborated by the results shown in Table 3. Factor 1 is a social factor – the two social factors load on it and the two self factors negatively load on it (so are strongly not associated with it). Factor 2 is an organizational factor. Factor 3 is a communication factor, with negative loading on the self questions, suggesting social and self motivations are polar opposites in Flickr.

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In summary, the factor analysis suggests that sociality (self vs. social), organization and communication factors are the three main independent types of motivation.

	Factor		
	1	2	3
Social1	.910		
Self2	-.869		
Social2	.765		
Self1	-.469		.438
Org2		.848	
Org1		.482	
Comm2			.610
Comm1			.541

Table 3. Rotated factor matrix

6. Discussion

The results from this investigation suggest that whilst it is possible to have a number of different motivations for using Flickr, as well as a number of different motivations for tagging images, tagging motivation will tend to be driven by only one direction of sociality (i.e., for oneself or for others) even if a person states that their motivation for using Flickr in the first place is for a mixture of self and social reasons. Tagging tends to be driven exclusively by either self or social reasons, with the factors of organisation and communication being less exclusive and in many cases playing a dual role.

The results of this investigation give a valuable insight why people publish and tag their images on Flickr, however the results cannot be generalised too widely due to the small sample size. Whilst some literature suggests that it usually takes no more than 12-25 cases to reveal the major difficulties and weaknesses in pre-test questionnaires [20] this is referring more to the design of the questionnaire and the discovery of things such as suppositions, awkward wordings or missing categories. In order to test the underlying assumptions of the information contained within the variables being questioned, it is suggested that, 'a minimum of five subjects per

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variable is required for factor analysis.' [21]. This investigation was therefore seven subjects short of the 40 required in order to fully test the 8 statements included in the factor analysis. However the results from the factor analysis were clear and conclusive in suggesting that there were three main factors which made up the motivational statements rather than the predicted four. Therefore as a pilot investigation this proved to be a worthwhile finding, which could be further tested using a larger sample.

Despite the heavy bias towards UK and Danish participants, no noticeable differences were found in the motivational intentions of these two nationalities, so the main factor is the European bias, which could be further investigated by having a larger sample from a more internationally representative set of countries.

As with all surveys there is the possibility that participants may have lied when answering questions. People often answer questions in the way that they think they are expected to answer, and people also often answer questions quickly, without giving much thought to their answers. In order to try to overcome this problem, the main motivational statement questions were paired up, to test the assumption that people should answer similarly on the pairs of questions.

As stated in the Results section of this paper, it is possible for someone to have more than one main motivation to use Flickr, as well as more than one main motivation for tagging their images. However, whilst motivations to use Flickr can be for a mixture of both self and social reasons (i.e., using Flickr as a personal archive as well as using it to share images with friends and family), tagging motivation was found to be exclusively for either self or social reasons. This is particularly interesting given that a number of participants in this investigation specifically stated both self and social reasons for using Flickr:

P17: "I use Flickr to archive for myself and also to promote my work." P25: "to store my images and to share with friends." P30: "as storage and for displaying my images to friends and family."

These statements would suggest that perhaps people are not fully aware of how much their tagging practices differ from their main motivations for using Flickr in the first place.

7. Conclusion

Whilst motivations for using Flickr and uploading images can be for a number of different reasons at the same time, motivations for tagging images tends to have a more predominant role. People may use Flickr as both a personal archive and as a place to share images with friends and family, but their reasons behind choice of tags will tend to be very distinctly either a 'self' or a 'social' action, with less hesitation in the mind of the tagger as to who will ultimately benefit from their choice of tag. People don't appear to want to use a mixture of highly personal and social tags; they will adopt one strategy or the other, regardless of if they are tagging for archive and storage or communicative purposes.

However in support of much of the previous work carried out on Flickr, the respondents who took part in this investigation seem to use Flickr for the social aspects and the community environment which it provides with social organisation and social communication being the two most popular motivational factors overall. Despite people's desire to have their images found and commented upon, as a general rule, people aren't interested in making a commercial gain from the images they upload – the community spirit of Flickr and its ability to connect people both known and unknown to the image uploader is its most appealing feature.

The responses from the pilot questionnaire have given a valuable first insight into why people publish and tag their images on Flickr, and also into the changing nature of self-publishing in the world of user-generated content.

Acknowledgements

The authors would like to thank Dr Ann O'Brien (Loughborough University) and David Goda (University of Wolverhampton) for their input and advice on the development of the questionnaire. A big thank you also goes to all of the participants who took the time and effort to complete the questionnaire and for providing such useful comments and feedback on their use of Flickr.

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