



## Incorporating user motivations to design for video tagging

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### ABSTRACT

User video tagging can enhance the indexing of large collections of videos, or can provide the basis for personalizing output. However, before the benefits of tagging can be reaped, users must be motivated to provide videos with tags. This article describes a two-stage study that aimed at collecting the most important motivations for users to tag video material. First, focus groups with internet users were held to elicit all possible motivations to tag videos on the internet. Next, 125 persons ranked these motivations for two cases via an online survey and responded to statements that assessed their acceptance of personalized output, based on their tags. Motivations related to indexing appear to be far more important for people than motivations related to socializing or communication. Furthermore, people were moderately positive about personalized output, based on their tags. Finally, important user barriers to tagging are discussed.

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### 1. Introduction

The Web 2.0 entails a trend on the internet in which a growing number of websites offer users the possibility to actively contribute content, commonly referred to as ‘user-generated content’. Where on the Web 1.0, content is generated solely by the supplier, in the Web 2.0 era, suppliers offer users the possibility to create their own website. Popular examples of this concept are YouTube and Wikipedia, websites which, respectively, let users create their own database with movies or their own online encyclopedia. In this context, suppliers become facilitators and motivating users to contribute to Web 2.0 applications is crucial, as the quality of output is dependent on the input provided by users (Högg et al., 2006).

Tagging is a user-generated means of contributing metadata to a resource. As the user is free to decide upon the actual content of a tag within the constraints of the system providing the opportunity to tag, we prefer to use an abstract definition of tagging so as to give in to this freedom and use the definition as formulated by Wu et al. (2006, p. 111): “labelling [resources] with free-style descriptors”. A resource can be any type of content item, ranging from photos to a specific area of a map, to videos. A typical example of a tagged resource would be a photo of a kangaroo which is tagged as ‘kangaroo’, ‘Australia’, ‘seen in Berlin zoo’ and ‘Marsupialia’. A total collection of tags on a given website is called a ‘folksonomy’. Well-known websites on which can be tagged are Flickr.com (an online photo sharing application) and last.fm (an online social music service).

The inclusion of tagging features can be very useful for internet users. As shown by Melenhorst et al. (2008), tagging can support users in finding information in large content collections. Tags describe a resource in the vocabulary of the user which may differ from the labels attributed to a resource by professionals (Matusiak, 2006). So when a search engine searches through collections of tags, resources can be found that comply with user terminology, thereby, presenting the user with what he or she needs (Melenhorst and Van Setten, 2007). Furthermore, when search engines search tags in addition to the regular web page content they scrutinize, the quality of the resulting search results is likely to increase (Morrison, 2008).

Besides the benefits of improved indexing, tagging can also be valuable to users when used to generate personalized system output. In this case, tags, related to a unique individual, can inform the system about user characteristics and attitudes (Carmagnola et al., 2007). Based on this information, a system can provide personalized search results or recommendations (Van Setten et al., 2006). For example, in an online music community, a user tags 20 video-clips as ‘Britpop’. The system might infer from this that the user is interested in Britpop (assuming that users would not look at videos and tag them if they did not like them) and consequently, recommend the 10 most watched Britpop videos to the user.

High user willingness to provide tags is a necessary prerequisite for using tags in content archives or personalized information systems. Therefore, it is crucial that systems, providing the feature to tag resources, tempt users to do so even though it costs them effort (to think of tags) and time (to type and submit them). This article discusses a two-stage study focusing on internet users’ motivations to tag video resources and is organized as follows. In Section 2 we will discuss user incentives to use internet technology, to contrib-

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ute user-generated content and to tag online resources. After an overview of the study in Section 3, after which Sections 4 and 5 address the first and second part of the study and the results they generated. Section 6 completes this article with a discussion, including design requirements and implications of the results of this study for tagging in general.

## 2. Theoretical background

Human motivation has intrigued psychologists for over a century. In general, the factors that have been found to affect human motivation are internal states (e.g., thirst), potential outcomes (e.g., monetary gain), and the perceived probability that invested effort will lead to a satisfactory outcome (Brehm and Self, 1989). Of course, the actual construction of motivation is more complex than a simple consideration of the aforementioned factors and is context-dependent (Ryan and Deci, 2000). As a result, motivations to act and how to increase human motivation have been studied in various contexts, like user instructions (e.g., Loorbach et al., 2006) or healthy eating behaviour (e.g., Dibsall et al., 2003).

One important distinction that has been made in motivation literature concerns *intrinsic* and *extrinsic* motivation. According to Deci and Ryan (1985), someone is intrinsically motivated when behaving in a certain way for fun or out of interest. One is extrinsically motivated when the displayed behaviour is instrumental to some other desirable end, like following a diet to lose weight. When an activity is not by itself fun or interesting, the added value of performing that activity needs to be clear to the individual, so as to create extrinsic motivation.

### 2.1. Motivations to use the internet

A large number of studies have pointed out that people's prevailing motivations to use the internet are extrinsic. Teo et al. (1999), for example, found that people use the internet mainly as a tool for getting work done and not as a source of enjoyment. In a literature review, Rodgers and Sheldon (2002) have listed four, more fine-grained motivations: acquisition of information, communication, exploration and acquisition of commercial goods.

Others have approached the issue of what motivates people to use the internet by means of the uses and gratification theory. According to this theory, humans have certain needs and they search for a suitable communication medium to gratify these needs (Katz et al., 1973). These gratifications can be interpreted as motivations to use a medium. Stafford et al. (2004) distinguished three gratifications to use the internet: content, process and social gratifications.

When focusing on single websites, a more nuanced picture emerges, in which incentives to use are not monopolized by extrinsic motivations. In the case of an online newspaper, usefulness has been found to be a greater motivator to use than ease of use (Lin and Lu, 2000), underlining the importance of the instrumental value provided by the website. But in the case of an online store, only intrinsic motivations explain people's use of the service (Shang et al., 2005), and when focusing on medical websites, both intrinsic and extrinsic motivations can play a role (Logan et al., 2000).

The aforementioned studies indicate that there is not a single list of motivations that explains website use. Instead, the motivations appear to be website-category specific.

### 2.2. Motivations to contribute user-generated content

As motivations are website-category specific, motivations to use the internet or a website do not necessarily apply to websites that offer users the option to contribute and share resources. The

relative importance of the different incentives to use websites may have changed or new motivations may have emerged, as in the last years, the internet has become more and more a social medium in which the focus has shifted from the provision of information to facilitating internet users to collaborate and communicate (Livingstone, 2003). YouTube, for example, has manifested itself not only as a website on which people can watch and share videos, but also provides its visitors the possibility to create and maintain a social network (Harley and Fitzpatrick, 2009; Lange, 2008).

Given the increasing popularity of sites with user-generated content like YouTube, it may be more informative for our study to focus on the incentives to produce user-generated content, of which tagging is an example. As in the case for motivations to use the internet, general motivations to produce user-generated content have been investigated. A study by Stoeckl et al. (2007) uncovered six motivations: external economic incentives, personal documentation, enjoyment, passing time, information dissemination and contact with others. These motivations include intrinsic as well as extrinsic incentives. Furthermore, the authors identified two crucial barriers for users to create content: the investment of time and concerns about privacy. Other studies that delved into motivations to produce user-generated content have focused on specific websites or applications. In the case of Wikipedia, the intrinsic motivation of fun is the number one motivation for Wikipedians (fanatic Wikipedia contributors) to write parts of the online encyclopedia (Nov, 2007). Lee (2006) found that users of del.icio.us (a social bookmarking tool) annotate their bookmarks more when they perceive their contributions to be appreciated by others.

A specific form of user-generated content that has received much attention from researchers interested in contributors' motivations is online knowledge sharing. In the setting of a professional community of practice, increasing one's reputation and strengthening social ties have been found to be the most important motivations to contribute knowledge (Wasko and Faraj, 2005). Ardichvili et al. (2003) uncovered that increasing one's reputation was also a motivator for contributing knowledge in the online community of one corporation, along with a feeling of moral obligation. Interestingly, the participants of this study indicated that their motivations were highly influenced by the corporation's culture. In the case of a non-professional setting, other (more community-related) motivators play a role: community interest, reciprocity and altruism (Wasko and Faraj, 2000), or, in the case of Yahoo! Answers: social motivators (Rafaeli et al., 2007). All these motivations have an extrinsic nature.

The motivations to contribute user-generated content, as described above, do not present a coherent picture. Sometimes intrinsic motivations play a dominant role and sometimes extrinsic motivations influence behaviour. We can only conclude here that the motivations to produce user-generated content seem to differ per kind of content and per context. Therefore, we will now focus on the kind of user-generated content that is the focus of this study: tags.

### 2.3. Motivations to tag

Although the amount of literature on user motivations to tag is currently somewhat limited, some incentives to tag on the internet have been reported. From collections of tags on books and music, Zollers (2007) deducted three motivations for users to tag a resource: opinion expressing, performance (creatively using tags to show off to others) and activism (to propagate a group view to the user audience). Marlow et al. (2006) listed six different, often cited, motivations for users to tag:

1. *Future retrieval*: marking items to retrieve them later.
2. *Contribution and sharing*: making resources findable for others.
3. *Attract attention*: making people look at one's own resources.
4. *Play and competition*: tagging resources by a set of rules.
5. *Self presentation*: making people know one is familiar with a resource.
6. *Opinion expression*: sharing one's opinion with people.

Furthermore, Marlow et al. state that people's first motivations to tag are egocentric (increasing the importance of an incentive like future retrieval). Only later on, a part of the taggers begin to appreciate the social aspects of this activity and social incentives start to play a role. However, Marlow et al. (2006) do not provide research that supports this assumption. They also state that there is no general set of user motivations that applies perfectly to every kind of system, as they may differ per kind of resource or system. Therefore, it is very fruitful to investigate user's motivations to tag *per kind* of resource (e.g., bookmarks or videos) and within a modality perhaps even per system.

Some studies investigated user motivations to tag on a system-specific level. From a collection of tags assigned to bookmarks, incentives like 'identifying what a website is about' and 'identifying who owns a website' were deducted (Golder and Huberman, 2006). As a result of interviews with users of two websites in the context of photo sharing, Ames and Naaman (2007) listed eight motivations to tag, including 'tagging to organize one's photos' and 'tagging to communicate contextual information to others'. Unfortunately, in both studies the authors were unable to rank the different motivations, and as a result, did not provide guidelines to system designers as on which incentives to focus, in order to encourage people to tag. For the case of Flickr.com, Nov et al. (2008) could make a distinction between the different motivations and found that social motivators are the most important for making people tag photos.

The motivations to tag, as discussed in the literature, are mostly extrinsic. Except for tagging as a game, labelling resources seems to be a means to achieve a goal. What the different sets of motivations to tag have in common with the motivations to use the internet or to produce user-generated content, is that they do not lead to a definite list with motivations to tag, generalizable to multiple kinds of resources or even systems. Therefore, it is wise to study user motivations to tag on a resource-specific basis (e.g., tagging books or videos). Furthermore, the discussed studies that list motivations to tag, mostly do not more than this: listing. This does not provide us with much information on the relative importance of each motivation and does not tell us which motivation(s) to focus on if we want to persuade users to tag. This study seeks to answer this question for the case of video tagging. Video has become a very important modality on the internet (e.g., YouTube alone is responsible for 10% of the North-American traffic on the internet (vnu-net.com, 2007)) and the number of videos available on the internet is growing every day. By first eliciting possible motivations to tag videos and then ranking them, we will get a clear picture of what will drive people to tag video content. Incorporating these motivations is crucial if one wants to seduce people in tagging (Fogg and Eckles, 2007). Finally, we will generate several user requirements for applications on which one can tag videos. This can ultimately lead to better opportunities for indexing video content and personalization of output associated with online video.

### 3. Study overview

The first stage of our study focused on generating a list of possible motivations to tag video resources on websites. Therefore, we conducted focus groups with internet users, which is a good means

to explore a topic that has not been documented (Morgan, 1996), like user incentives to tag videos. Besides a list of motivations, we also aimed at eliciting the most important barriers to tag video resources. In the second stage of our study, we wanted to assess the relative importance of the different motivations for two specific Dutch online video platforms. Via an online survey, we made a large number of people rank the different motivations for each video platform. Furthermore, we asked them which kinds of personalized output, based on user tags (e.g., commercial recommendations) they find acceptable. As a result, we will be able to formulate concrete design guidelines for video platforms that encourage users to tag. The user-centered focus we applied in this study has, besides the interviews conducted by Ames and Naaman (2007), not been applied before, but will result in information that is extremely valuable when one wants to design according to user wishes and needs.

### 4. Study 1: eliciting user motivations to tag

#### 4.1. Focus groups setup

We conducted two focus groups, each with a distinct set of participants: young (five participants, aged 18–23) and middle-aged (six participants, aged 34–57) internet users. By talking to the 'information elite' (the young participants) with high digital skills and high internet usage, as well as the 'regular user' (the middle-aged participants) with normal digital skills and ditto internet usage, we wanted to consult different views on tagging, collect all possible motivations, and discuss user barriers to tag for different user groups.

Both focus groups were audio-recorded and lasted about 1 h. The participants were informed that they would remain anonymous. First, we questioned the participants about their experiences with tagging and their self-reported digital skills. Then, we showed the participants four websites on which one can tag video resources.

1. Youtube ([www.youtube.com](http://www.youtube.com)). A platform offering all kinds of videos to a general audience.
2. Hyves ([www.hyves.nl](http://www.hyves.nl)). A Dutch social network site (comparable to Facebook or MySpace) that features uploading and sharing videos with a specific audience such as family or friends, or alternatively, the whole world.
3. Skoepe<sup>1</sup> ([www.skoeps.nl](http://www.skoeps.nl)). A Dutch news website offering news videos to a general audience.
4. 3voor12 ([www.3voor12.nl](http://www.3voor12.nl)). A Dutch online music community offering music videos to a general audience.

These systems represent the plurality of video platforms available on the internet, as categorized by Sen et al. (2005). After an explanation of each system, we asked the participants why they would tag (or not) when either viewing or submitting video content.

The focus groups were transcribed and scrutinized for motivations by the authors. Barriers to tag videos were identified from the transcripts and participants' reactions to each barrier were grouped, as proposed by Patton (2002).

#### 4.2. Focus groups results

The young participants could indeed be classified as the information elite. They were all attending college at a university and

<sup>1</sup> After data collection, Skoepe ceased providing its services and the website cannot be consulted anymore.



were daily internet users with high self-reported digital skills. All but one had experience with tagging and were users of Web 2.0 systems like Wikipedia and Amazon. Two persons used Flickr.

The middle-aged participants appeared to be regular users. They were middle or highly educated and all of them were frequent or daily internet users, who typed their own digital skills as sufficient. Their experience with Web 2.0 systems was mixed.

The focus groups resulted in three categories of motivations to tag video resources: motivations related to indexing, socializing and communication.

#### Motivations related to indexing:

- *Tagging as a means to re-find a movie:* to be able to search for it yourself using these words in a query.
- *Tagging as a means to make others able to find a movie:* to enable others to search for it using these words in a query.
- *Tagging as a means to clarify or add information to a movie:* to explain what the viewer sees.
- *Tagging as a means to be able to find information, related to the movie, later on:* to help yourself remember what keywords are related to the movie which can be used in search queries in other systems.

#### Motivations related to socializing:

- *Tagging as a means to recommend a movie to others:* to advice people to watch a movie or not.
- *Tagging as a means to find friends or likeminded people:* to create a user profile so it can be matched with other people's profile and recommendations can be derived.

#### Motivations related to communicating:

- *Tagging as a means to express a personal opinion:* to let the world know what you think about a movie-related subject.
- *Tagging as a means of communication:* to send a message to other viewers of the movie.

Besides the user motivations, the focus groups brought forth some user barriers to video tagging. The first barrier is *privacy*. Especially the middle-aged respondents hesitated to label videos because of privacy issues, as they feared the possible consequences of submitting information that could be traced to their person. These fears were fed by negative media publicity about user-generated content (e.g., employers searching the internet for information on future employees and finding harmful information). One middle-aged participant stated it as follows.

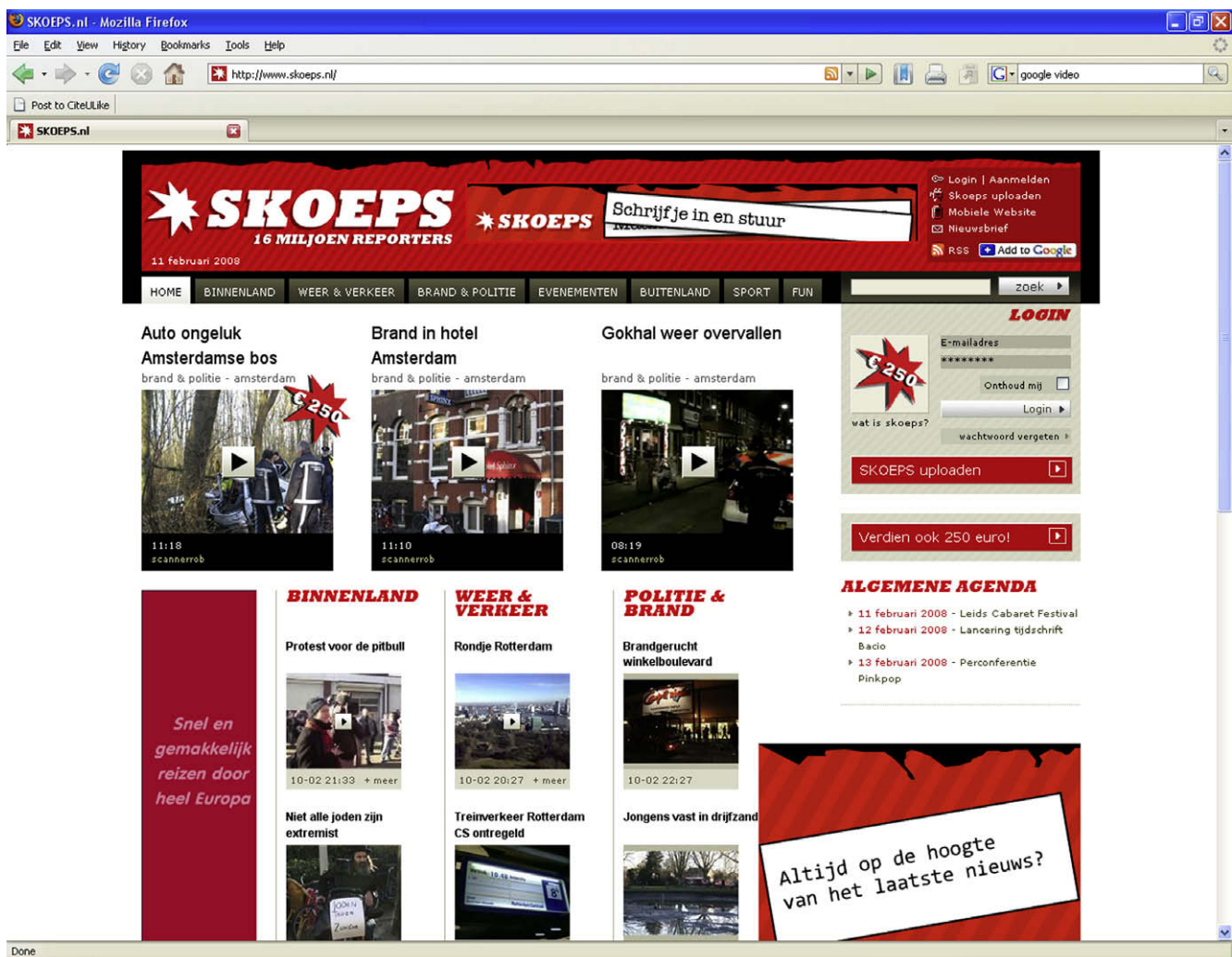


Fig. 1. Skoeeps homepage (in Dutch).

"You give a lot of information to a website [...] How can you remove that information? What will people do with it? How confidentially is it treated? You don't know. Out of principle, I won't give that kind of information."

The young participants however, saw no harm in tagging videos and were not concerned about their privacy in this case.

The second barrier concerns the fact that all participants typed themselves as *information consumers*. They explicitly indicated that, out of principle, they only wanted to profit from the work done by others. However, after discussion, the participants agreed that they would tag video content for which they felt a passion, indicating that high personal relevance of the video content is an important antecedent for users to tag. As one young participant stated it:

"It has to do with your passion for music. You want to share that with other people who also have that passion. I don't have a passion for news [...] On a site with movies I would also be more eager to tag. Because of your interests you are more closely connected to such a site and you don't just scroll through it. In that case you would just let the people who are interested do the tagging."

Current *tagging interfaces* are the third barrier. The young participants indicated they only sporadically tagged information on the internet as they were often unaware of the possibility to do so. This finding implies that current user interfaces do not confront

the user with the option to tag successfully, hence limiting the amount of tags users provide to the system.

## 5. Study 2: ranking user motivations to tag

### 5.1. Case descriptions

After eliciting possible motivations for tagging videos on websites, we established their relative importance via an online survey for two specific cases: Skoeeps and 3voor12. As we mentioned above, Skoeeps is an online news website which offers users the possibility to upload and watch videos containing local news, mostly shot with mobile phones. The homepage of the website is shown in Fig. 1.

When uploading a movie, one can add tags to it, which are used to match movie metadata to search queries. An example of an uploaded movie about a carnival procession which featured a float resembling a farm house can be found in Fig. 2. It is tagged as 'farmer', 'carnival', 'events', 'Hilvarenbeek' (the town in which the procession was held) and 'procession'.

The online music community 3voor12 offers music, concert registrations and music clips to its user group. The website offers the possibility for users to search for resources via tags, to organize listened or watched resources in categories of tags, or to browse

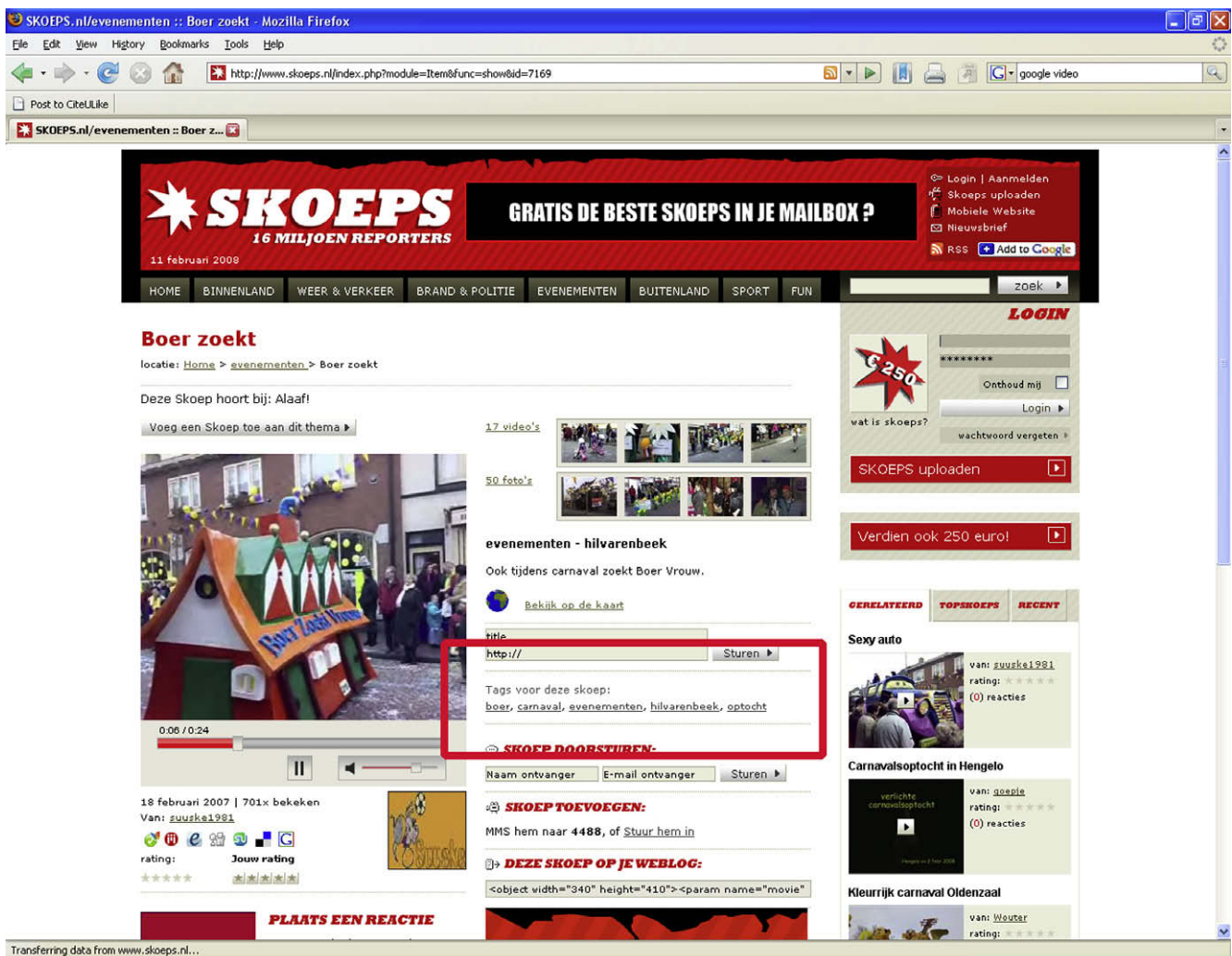


Fig. 2. An uploaded movie in Skoeeps (text in Dutch; tags are highlighted by red box). (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

other users' favourite music as indexed by their tags, which can be used as an instrument to discover new music. Fig. 3 shows the 3voor12 homepage and Fig. 4 shows a video clip of *The Kooks*, titled 'Ooh La', which is tagged as 'hit song', 'England', 'charming guy with curly hair', 'sixties' and 'Paris'.

## 5.2. Online survey setup

We created a survey with items, derived from relevant sources and cited below. If there was no source available, we created the items ourselves. Next, the items were checked by an expert in survey construction. The complete survey can be found in Appendix A and consists of the following parts:

1. *Demographics and Web 2.0 use.*
2. *Familiarity with tagging.* We asked the respondents whether they know what tagging is. Then we gave them an explanation of tagging, supported by the example of Flickr.
3. *Experience with tagging.* We asked whether respondents ever tagged something on the internet, and if so, how often and where. If they stated to have tagged more than 10 times in

the past, we asked them to rank the Marlow et al. (2006) incentives for tagging for their personal situation. If they tagged less than 10 times, we assumed they did not have different goals in mind while tagging, and therefore, could not successfully rank these incentives. We used the Marlow et al. classification here, as it focuses on tagging in general.

4. *Case 1: Skoepe.* After an explanation of Skoepe and its tagging features, we asked whether the respondents were familiar with Skoepe or not, and if so, for what purposes they used the website. Then, we made them rate their affinity with local news, using four statements and 7-point Likert scales. In order to determine the context in which Skoepe is used, which may influence how and why people tag, we asked the respondents to rank six reasons to watch a movie on Skoepe, derived from Lee and Lee (1995) and previously used successfully by Van Setten (2005):
  - *Committed/ritualized viewing:* watching videos out of habit.
  - *Mood improvement:* watching videos for fun.
  - *Informational/cognitive benefit:* watching videos to learn.
  - *Social learning:* watching videos to learn how to deal with other people.

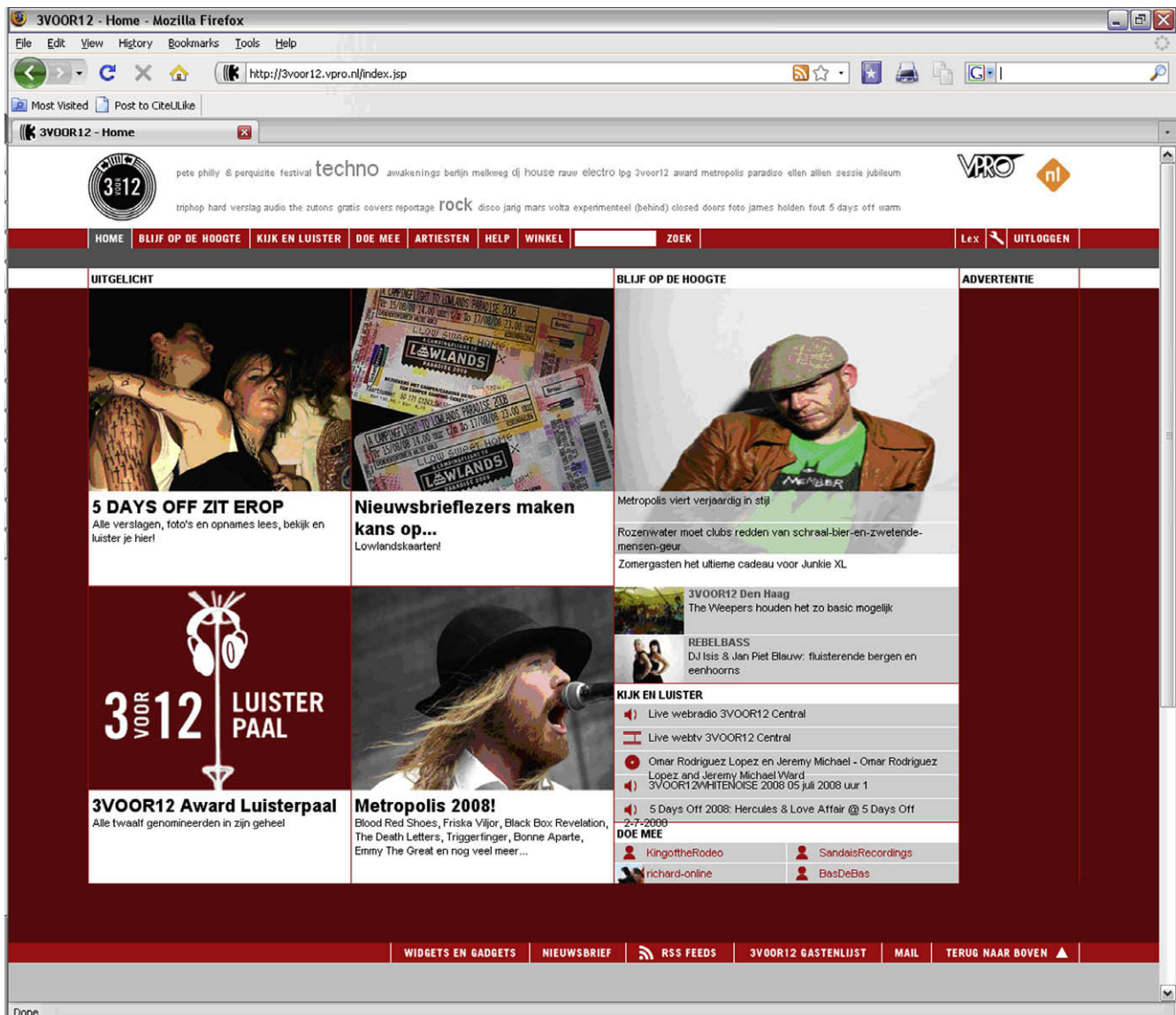


Fig. 3. 3voor12 homepage (in Dutch).



- *Social grease*: watching videos so as to have something to talk about with others.
- *An engrossing different world*: watching videos to experience something new.

The respondents' propensity to tag on Skoepe when uploading a movie was assessed by a statement, where agreement was to be scored on a 7-point Likert scale. In order to assess the importance of the different motivations to tag videos for this case, we made the respondents rank them. Finally, we asked the respondents to indicate their agreement on four statements on acceptance of using tags for personalized recommendations with 7-point Likert scales. Each statement represented a different kind of personalized recommendation, as set out by Kobsa et al. (2001): recommendations concerning products, recommendations concerning information and navigation recommendations.

5. Case 2: 3voor12. The same procedure as described for Skoepe was applied to 3voor12.

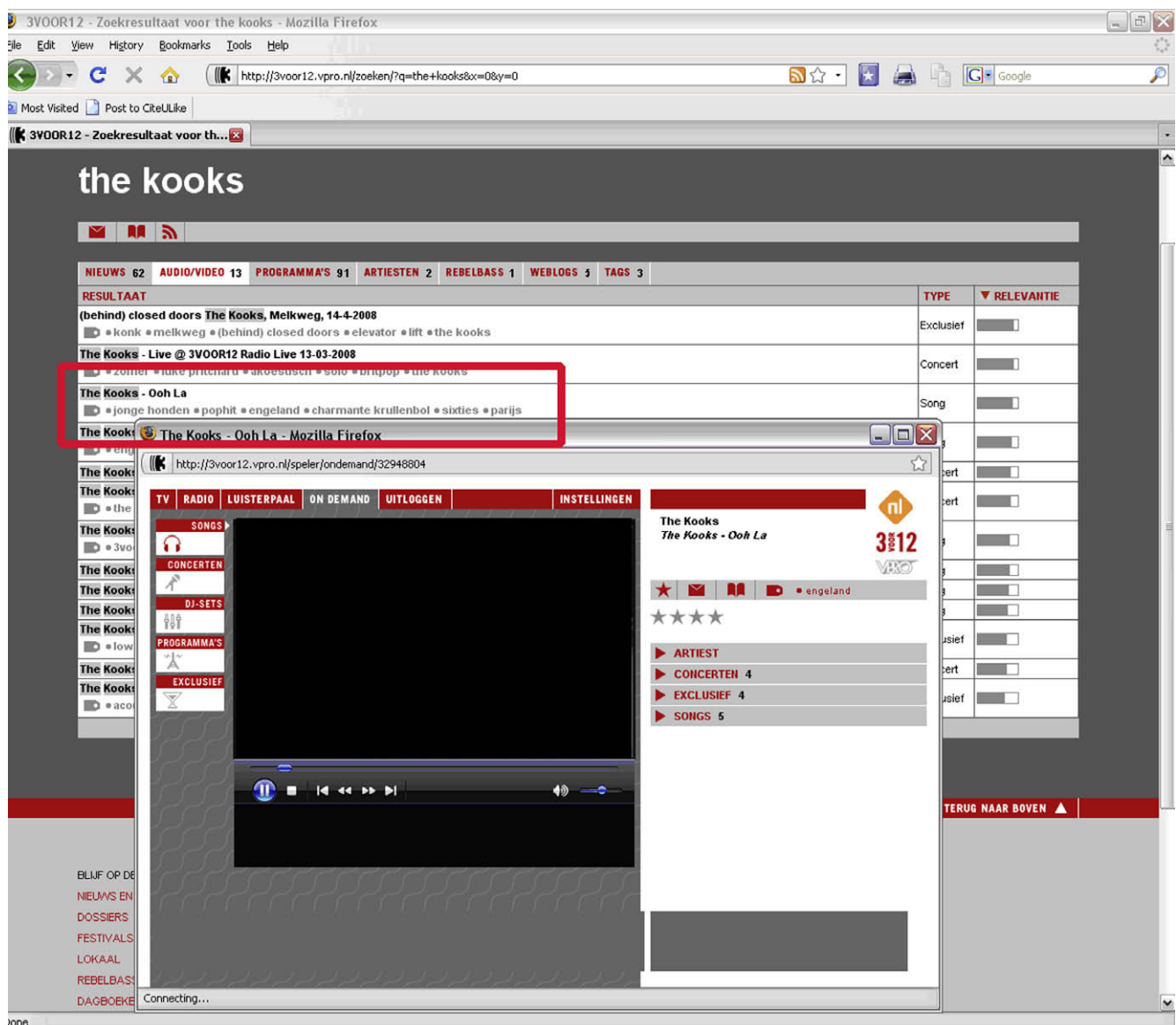
We aimed for a group of respondents that partly did have and partly did not have experience with tagging, so as to be able to

compare the different opinions they hold about tagging. Because tagging is a technique that may not be widely used by the average internet user, we choose to ask the information elite to complete the questionnaire. The information elite is a group of internet users, which can be typed as active information seekers and communicators who are keen on using digital media (Pieterse et al., 2005) and therefore, we assumed, a large part of them would be familiar with tagging. As information elitists are highly educated (Van Dijk, 2005), we approached social sciences undergraduates and young professionals. The social sciences undergraduates were asked to complete the survey in exchange for credit points, while the young professionals were asked to complete the survey after which they had the chance to win one of five gift vouchers.

### 5.3. Online survey results

#### 5.3.1. Demographics and Web 2.0 use

In total, we received 125 questionnaires, of which 88 originated from the students and 37 originated from the young professionals. The respondents consisted of 40 men and 85 women with an aver-



**Fig. 4.** A music clip on 3voor12 (text in Dutch; tags are highlighted by red box). (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

age age of 22.95 years ( $SD = 6.04$ ). Almost all of them were highly educated: 13.6% completed university, 12.8% completed college and 70.4% was a University student. All respondents used computers on a daily basis and 96% also used the internet every day. Table 1 displays the activities for which they used the internet, while Table 2 displays the Web 2.0 services, used by the respondents. It shows that many respondents had some experience with Web 2.0 services, although the percentage of people that used Web 2.0 services containing the possibility to tag was low.

When we asked whether they knew what tagging on the internet is, 20% of the respondents responded positively, while 80% did not know what tagging entailed. The number of people that had actually tagged on the internet was 21 (16.8%). Seven of them had tagged only 1–5 times, while another seven were more fanatic taggers and had labelled resources more than 50 times. Most tagging was done on Google (five persons) and YouTube (four persons). As only nine participants had enough experience with tagging to rank the Marlow et al. incentives, and therefore were not large enough in number to representatively represent the total population of the information elite, we did not analyze these results.

### 5.3.2. Watching and tagging videos: results from two cases

We investigated the respondents' motivations to tag in two cases: Skoepe and 3voor12. Just one participant ever used Skoepe, while 3voor12 was used by nine respondents.

A Friedman rank test was applied to ascertain how the participants ranked the motivations to watch videos on Skoepe and 3voor12, and is displayed in Table 3, where the lower a rank, the more important the motivation was for the respondents. The ranks of the motivations differ in the case of Skoepe,  $\chi^2(5, N = 123) = 184.76, p = .000$ , and in the case of 3voor12,  $\chi^2(5, N = 123) = 321.01, p = .000$ . In both cases, the respondents' main motivations to watch the movies are for fun or for their informative value: intrinsic motivations.

The possible motivations to tag videos, as distilled from the focus groups, were presented to the respondents for both cases. Next, they were asked to rank these incentives. Again, we applied a Friedman rank test to determine the relative importance of each

**Table 1**  
Respondents' internet use.

	Activity	% of respondents
1	E-mail	100
2	Searching information	98.4
3	Electronic banking	87.2
4	Chatting	81.6
5	Watching films/listening to music	80.8
6	Surfing	79.2
7	News, weather and sports	72.8
8	Downloading software	60.8
9	Watching tv/listening to radio	56.8
10	Using government services	40.8
11	Online telephoning	40.0
12	Gaming	38.4
13	Searching for job vacancies	35.2

**Table 2**  
Respondents' Web 2.0 use.

	Website	% of respondents
1	Wikipedia	90.4
2	Hyves/facebook/myspace	67.2
3	Amazon	38.4
4	iGoogle	21.6
5	Flickr	12.0
6	Last.fm	7.2

**Table 3**  
Ranked motivations to watch videos on Skoepe and 3voor12.

Motivation	Friedman rank	
	Skoepe	3voor12
Committed/ritualized viewing	2.89	2.90
Mood improvement	2.43	1.54
Informational/cognitive benefit	2.89	2.99
Social learning	5.14	5.08
Social grease	3.35	3.52
An engrossing different world	4.31	4.97

motivation. Results can be found in Table 4. In the case of Skoepe, the ranks differed,  $\chi^2(7, N = 124) = 249.73, p = .000$ , as was the case for 3voor12:  $\chi^2(7, N = 123) = 261.39, p = .000$ . The table shows that, in both cases, the respondents' main motivation to tag was to make others able to find a movie. Furthermore, motivations related to indexing appear to be more important for the respondents than motivations related to socializing or communicating. In both cases, this last group of incentives even seems to play no or a very marginal role in motivating users to tag videos.

The propensity to tag videos on Skoepe and 3voor12 was tested by means of 7-point Likert scales (from 1: low propensity to 7: high propensity). The propensity to tag a video, uploaded to Skoepe, was awarded a mean score of 4.75 ( $SD = 1.85$ ) and the propensity to tag a video watched on 3voor12 was awarded a mean score of 3.44 ( $SD = 1.83$ ). The difference between these scores is significant  $t(122) = 6.60, p < .01$ , which shows that the respondents are more willing to tag a movie they upload themselves to Skoepe than they are willing to tag a video they watch on 3voor12.

The intention to tag might be influenced by the affinity a person has with the content of a video, as suggested by the focus group results. In this study, the content focuses on local news (Skoepe) or pop music (3voor12). For both cases the affinity with the subject was assessed by means of four 7-point Likert scales. Reliability analysis resulted in a Cronbach's alpha of .83 for 'affinity with local news' and a Cronbach's alpha of .68 for 'affinity with pop music'. We conducted regression analysis to determine whether higher affinity with the content (local news or pop music) led to a higher propensity to tag this content. We did not find an influence of the affinity with local news on the propensity to tag videos on Skoepe ( $\beta = .00, n.s.$ ), nor an influence of the affinity with pop music on the propensity to tag videos on 3voor12 ( $\beta = .15, n.s.$ ). Interest in a topic does not appear to be a motivator to tag videos.

### 5.3.3. Personalization on the basis of tags

We investigated users' acceptance of personalization on the basis of tags in order to determine whether this functionality will be

**Table 4**  
Ranked motivations to tag videos on Skoepe and 3voor12.

Motivation	Friedman rank	
	Skoepe	3voor12
<i>Motivations related to indexing</i>		
To re-find a movie	3.91	3.15
To make others able to find a movie	2.28	2.76
To clarify or add information to a movie	3.48	3.70
To be able to find information, related to the movie, at a later instant	4.44	3.82
<i>Motivations related to socializing</i>		
To recommend a movie to others	4.31	4.57
To find friends or likeminded people	6.19	5.89
<i>Motivations related to communicating</i>		
To express a personal opinion	5.89	5.93
As a means of communication	5.49	6.18



**Table 5**

Acceptance personalized output, based upon user tags.

Personalized output	Skoeps	3voor12
Commercial product recommendations	2.84 (1.68)	4.19 (1.76)
Resource recommendations	4.55 (1.53)	4.90 (1.42)
Personalized overview maps (e.g., tag clouds)	4.45 (1.59)	4.79 (1.61)
Personal homepage	4.18 (1.68)	4.42 (1.73)

used when implemented in the future. The acceptance of personalization based upon user tags was assessed by means agreement on four items on using tags for four different kinds of personalized recommendations. Item scores and standard deviations can be found in Table 5. The table shows that commercial recommendations by Skoeps, based on user tags, are not appreciated by the respondents. In the case of 3voor12, the average respondents' disposition towards this kind of personalized output was neutral. This difference is significant  $t(124) = -8.45, p < .01$ . The differences between the scores for resource recommendations was also significant  $t(123) = -2.79, p < .01$ , as was the difference between the scores for personalized overview maps  $t(124) = -2.78, p < .01$ . The difference in scores for the personal homepage were not significant:  $t(124) = -1.81, n.s.$  In the case of 3voor12, people seem to be more willing to accept personalized output.

We combined the answers to the four personalization items for the cases of Skoeps and 3voor12 to calculate Cronbach's alpha. The items assess the acceptance of personalization on the basis of user tags well ( $\alpha = .76$ ). We analyzed whether affinity with the website content influenced the acceptance of personalization. In the case of Skoeps, the affinity with local news had no influence on the acceptance of personalized output, based upon tags ( $\beta = .08, n.s.$ ). The influence of affinity with pop music on the acceptance of personalized recommendations did turn out to be significant ( $\beta = .34, p < .001$ ). The higher acceptance of personalized output in the case of 3voor12 can partly be explained by the content offered by the system. Pop music seems to be a suitable candidate for personalization on the basis of user tags.

## 6. Discussion

### 6.1. Designing for tagging on video platforms

Motivations related to indexing appear to be the most important incentives to tag videos, with the motivation to make others able to find a movie as the most important one of all. The motivations to tag related to socializing are less important than the motivations related to indexing, while the motivations related to communicating only play a marginal role in driving users to tag videos. The social motivations to watch videos on both sites were also not ranked on top by the participants, thereby underlining the relatively low importance of behaving socially when interacting with video platforms. As the results showed, high affinity with the topic of a video does not lead to a higher propensity to tag. This finding implies that users do not tag, just because they are interacting with something they like, and therefore want to share it with the world. Tagging is mainly done with a clear purpose in mind, like making it easier for oneself to retrieve a particular video. The situation differs when it concerns videos uploaded by users themselves. In that case they are involved in such a manner with the resource, that it encourages them to tag. Clearly, tagging is driven by extrinsic motivations and therefore, the added value of tagging needs to be made explicitly clear to users.

Our findings can be translated into specific interface and feature requirements for applications in which users can tag videos. The interface requirements are:

- The system should display the tagging input mechanisms prominently on the interface.
- The tagging input mechanism must be accompanied by a brief explanation of the added value of tagging.
- The explanation of the added value of tagging must stress the usefulness of tagging for (re)finding videos.

The implementation of the following feature requirements must seduce users into tagging videos because they will be rewarded with functionality that will increase system usability. This functionality enables users to re-find watched movies, or to find related video content.

- The system must display a personal list of the 10 most used tags. Each tag in this list must link to a list of movies the user tagged as such.
- The system must recommend video content based on tags provided by a user.

The results of this study also have some limitations when it comes to explaining users' motivations to tag video content. First of all, we mainly questioned people who were either unfamiliar with tagging or did not tag on websites themselves. Therefore, the motivations we identified in this study do not directly explain the behaviour of current video taggers, but list the reasons that are most likely to persuade non-taggers into tagging video resources. Furthermore, Marlow et al. (2006) suggested that the social aspects of tagging only start to play a role after a tagger has some experience with labelling resources. Although their statement was unfounded; this study supports this assumption in the sense that motivations related to indexing were more important than motivations related to socializing. Whether the motivations of users to tag change over time, we are not able to say on the basis of this study: a longitudinal setup will be necessary to generate this information. Despite these limitations, the study has provided valuable design input for future applications that support video tagging. By incorporating the requirements we listed above, more (currently non-tagging) users will be encouraged to tag videos, thereby increasing the number and diversity of tags, ultimately increasing the quality of video metadata.

### 6.2. Representativeness of folksonomies

We were surprised by the low percentage of respondents familiar with tagging. Especially since all the respondents can be typed as members of the information elite and, therefore, were expected to adopt new technologies (like tagging) at a very early stage. If only 20% of the information elite is familiar with tagging, the percentage of the total population of internet users, familiar with tagging or taggers themselves, will be considerably lower. This has its consequences. As tags are only provided by a small number of users, folksonomies (the total collection of tags in a given system) only represent the word choice and interests of this small group. A folksonomy, not representative of the total user group's word choice and interests, has limited value for the complete user population: tags may be too difficult to understand or may not lead to interesting resources, due to conflicting interests. Indirectly, unusable tags will not motivate non-taggers to label resources as they will not see the added value. These negative developments can be prevented by motivating all users to tag resources from a system launch on, thereby creating a representative folksonomy. The design guidelines we suggested in Section 6.1 can be a valuable help here.

A different approach to creating a useful collection of tags is to let professionals tag resources until the audience at large is familiar with tagging and more interested in tagging resources. This way, a folksonomy created by a small group of users, and the pos-

sible negative consequences can be prevented. However, if tagging by professionals leads to the same problems by putting together a difficult to understand and nonvalue-adding collection of labels as well, nothing is gained. Therefore, future research should focus on the agreement between tags provided by professionals and the 'average' user. A related question that plays a role here is whether the 'average' user understands tags provided by a professional. In the case of video or photo sharing websites, these hypothetical problems may seem like non-issues. After all, a photo of a basketball player does not quickly lead to difficult or non-representative tags. However, in other domains, like e-government or e-learning, where tagging can be used to enhance the indexing of difficult and lengthy resources (e.g., legislation or learning material), these matters are crucial to success.

### 6.3. Personalization on the basis of user tags

The respondents did not like to receive commercial recommendations from Skoepe, but were not negative about this kind of personalized output, when provided by 3voor12. This implies that users' like or dislike towards commercial personalized output, based on tags, is system dependent. The large concern about user privacy in the case of personalization, as discussed in the literature (e.g., Pieterse et al. (2005)) is justified, but should not lead to a boycott of personalization, as for some cases it is accepted and value-adding (see, for example, the success of Amazon's recommendations (Linden et al., 2003)).

The other forms of personalized output were not dejected by the respondents, who had either a neutral or positive disposition towards them. Furthermore, the results indicated that for at least one subject (pop music), a higher affinity with the subject results in a higher acceptance of personalized output. We think these findings are most encouraging for the development of personalized systems. If users are not negative about the possibilities offered to them via personalization without actually experiencing them, but on descriptions alone, they may also be interested in using them when implemented on a larger scale in the future. Of course, the user acceptance of tailored output is unsure as long as we do not conduct case studies with (prototypical) systems offering these features in real life. The fact that we did not include systems that could demonstrate the personalization of output based on user tags can be considered a drawback of our study setup, as the results describe a hypothetical situation. Nonetheless, the results can be of value for future studies that delve deeper into the matter and are a first indication of how people will respond to this novel phenomenon on the internet.

We are of the opinion that tagging and personalization will become intertwined in the future, in the form of, for example, the display of filtered tags for a resource, so as to show only the tags provided by taggers like the operating user, thereby increasing their value. On the short term, we think the forms of personalized output, as assessed in the survey, are more feasible to realize. We urge researchers and designers to take this development into account when constructing their research or when designing a tagging application. Even though the rise of tagging has only been short, and it has not proven to be a permanent presence on the web yet, technical developments already transform the way tags can and will be utilized.

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### Appendix A. Online survey (translated from dutch)

#### [Questions on demographics]

1. Nowadays you can tag on many websites. Do you know what tagging is?

- Yes
- No

#### [Explanation of tagging]

2. Did you ever tag something on the internet?

- Yes
- No

3. [If yes on 2] How often did you tag something on the internet?

- 1–5 times
- 5–10 times
- 10–25 times
- 25–50 times
- 50 times or more

4. [If yes on 2] On which websites do you tag most often?

5. [If tagged more than 10 times on 3] Below are six reasons to tag on the internet. Can you rank these in order of importance? So, which reason has been most important for you to tag in the past, which one after that, which one after that, etcetera. You can do this by awarding the numbers 1–6 to the reasons: 1 for the most important reason, 2 for the second most important reason, until 6, the least important reason

- To be able to retrieve information (e.g., text or a photo) later on more easily
- To add information to a (part of a) website
- To bring information to the attention of others
- As a part of a game
- To make my own interests and characteristics known
- To make my personal opinion known

#### **Skoeps**

##### [Explanation of Skoepe]

6a. Do you know Skoepe?

- Yes
- No

7. [If yes on 6a] What do you do on Skoepe?

- Watch local news
- Add local news

#### **3voor12**

##### [Explanation of 3voor12]

6b. Do you know 3voor12?

- Yes
- No

7. [If yes on 6b] What do you do on 3voor12?

- Keep up with news on pop music
- Listen to music
- Watch video clips or concerts
- Keep a weblog
- Talk on forums
- Search for new, unknown bands/ artists

8. The following statements assessed affinity with local news (Skoeps) or pop music (3voor12)

- I think local news is interesting
- I keep up with the local news in my region
- When my region is on the TV news, it attracts my attention
- I know what happens in my region
- I like pop music
- I keep up with the news on pop music
- When my favourite artist is on TV, it attracts my attention
- I often consult concert agendas

9. Below are six reasons to watch a video on Skoepe/3voor12. Can you rank these in order of importance? So, which reason is the most important for you to watch a video on Skoepe/ 3voor12, which one after that, which one after that, etcetera. You can do this by awarding the numbers 1–6 to the reasons: 1 for the most important reason, 2 for the second most important reason, until 6, the least important reason

**Appendix A** (*continued*)

– Because I often watch videos on the internet	– Because I often watch videos on the internet
– To relax	– To relax
– To keep up with local news	– To keep up with pop music
– To learn about myself	– To learn about myself
– To have something to talk about with friends	– To have something to talk about with friends
– To watch something I will never experience myself	– To watch something I'll never experience myself
10. The following statement assessed the propensity to tag on Skoeeps or 3voor12	
If I upload a video with local news to Skoeeps, I will tag it	If I watch a concert or videoclip on 3voor12, I will tag it
11. Below are six reasons to tag on Skoeeps/3voor12. Can you rank these in order of importance? So, which reason will be the most important for you to tag on Skoeeps/3voor12, which one after that, which one after that, etcetera. You can do this by awarding the numbers 1–6 to the reasons: 1 for the most important reason, 2 for the second most important reason, until 6, the least important reason	
– To retrieve my video later on	– To retrieve a video later on
– To enable others to find my video	– To enable others to find a video
– To add information to a video or make it clearer	– To add information to a video or to make it clearer
– To find related information later on	– To find related information later on
– As a way to recommend a video to others	– As a way to recommend a videoclip or concert to others
– As a way to find friends or people with the same interests	– As a way to find friends or people with the same interests
– As a way to give my personal opinion	– As a way to give my personal opinion
– As a way to leave a message for other visitors	– As a way to leave a message for other visitors
12. A website can use the tags you have given, to provide you with tailored information. In other words, you get information designed for you personally. Please indicate whether you agree with the following statements or not	
Skoeeps may use my tags to...	3voor12 may use my tags to...
– Recommend products (e.g., offers from restaurants in municipalities where you made videos)	– Recommend products (e.g., CDs or concerts)
– Recommend other videos on Skoeeps	– Recommend other artists or bands on 3voor12
– Map the subjects of which I create videos (e.g., a top 10 of your favourite subjects)	– Map the concerts or videoclips I watch (e.g., a top 10 of your favourite music styles)
– Create a personal Skoeeps homepage, based upon my interests	– Create a personal 3voor12 homepage, based upon my musical taste

All statements were to be scored on a 7-point Likert scale, ranging from negative (1) to positive (7).

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