

# Challenges and Opportunities for Knowledge Organization in the Digital Age

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Porto, Portugal

Organized by  
International Society for Knowledge Organization (ISKO),  
ISKO Spain and Portugal Chapter  
University of Porto – Faculty of Arts and Humanities  
Research Centre in Communication, Information  
and Digital Culture (CIC.digital) – Porto

Edited by  
Fernanda Ribeiro  
Maria Elisa Cerveira

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## **Challenges of organization and retrieval of photographs on social networks on the Internet**

### **Abstract**

The purpose of this study was to analyze the evolution of the behavior of social network users on the Internet regarding the storage and retrieval of photographs, and how knowledge organization has been introduced in a natural and progressive way, through platforms and applications, in their day-to-day lives. This makes the experience of photograph sharing quicker, simpler and more attractive. Through the observation of how the sharing, storage and organization of photographs in these environments is done, it is our aim to record and contribute to a study of the impact on personal and collective memory in a society that has been using social networks as a place to store personal photographs and records of daily activities and events.

### **Introduction**

It has been only 27 years since Tim Berners-Lee made the World Wide Web available to the public. Since then, the Internet has become popular and today is an integral part of the daily lives of half the world's population, totaling 3.7 billion users (Hootsuite 2017). As Internet connection increased in reach, quality and speed, users and developers began exploring more functions and Internet applications, which caused the emergence of many sites with high user interactivity, among them, social networks. Since 2004 this scenario has been known as Web 2.0, characterized by mechanisms of collaboration directed to the user, where usability predominates, such as the use of free language, folksonomy, and keywords in tags. Despite synonymy and polysemy problems, it has high usability and the more it is used, the more useful it becomes (Moreiro Gonzalez 2011, 35). Globally, since 2007 the time spent on social networks has surpassed e-mail time. Similarly, the number of social network users has overtaken those of e-mail since 2009. Thus, the most important activity on the Internet occurs through social networks, and these sites are becoming platforms for all types of activities besides friendships: e-commerce, education, marketing, media, entertainment, sociopolitical activism, among others (Castells 2015, 40).

Digital network technologies allow people and organizations to manage their own content and messages and share them with friends, family, customers, and so on. A significant part of this is done through photographic images, which are used for various purposes, such as informing, communicating, remembering and, by not requiring words or a language to be understood, they have almost universal reach. According to Layne (1994, 583-588), an image can say something that a text alone cannot, and perhaps for its ability to communicate so much in such a short time, photography has been used so much and in so many ways on the Internet.

With the increase in the available space on Internet servers and the increasing amount and speed of information to which we are exposed daily, users and developers have begun to look for means of administering the content that traffics on the web. Parallel to this, the growth of personal photographic files on social networks on the Internet requires urgent attention and intervention as to the security and integrity of these documents and to the consequences in individual and collective memory. In this context, knowledge organization brings concepts that can solve one of the biggest challenges of the Internet, the organization and retrieval of photographs on social networks. Knowledge organization and representation schemes can help users and developers to save time and space on the web, optimizing the search, retrieval of information and access.

The purpose of this study is to analyze the behavior of social network users on the Internet in relation to the storage and retrieval of photographs, and how knowledge organization has been introduced in a natural and progressive way, through platforms and applications, in their day-to-day lives, thus making the experience of photograph sharing quicker, simpler and more attractive.

Accordingly, we performed a historical and analytical study of the use, sharing and custody of photographs in the main social networks created particularly for this purpose, a bibliographical review of how some knowledge organization instruments have been used in social networks on the Internet for organization and retrieval of photographs, and to understand and analyze social network users' behavior, we conducted an online questionnaire about their experience regarding the use of photographs on the Internet. The questionnaire was available online between 13th and 29th December 2017 and obtained 2,126 answers. The Google Forms App was used and the dissemination was done mainly by social networks Facebook and WhatsApp. Considering that the number of social media users in the world is currently 2.8 billion (Hootsuite, 2017), our research presents a statistical sampling error of 2% with a 90% confidence level.

### **Small revolutions of the main social networks**

Facebook is characterized as a social network facilitating the exchange of experiences, events and ideas, where photograph sharing has increasingly expanded both in terms of quantity and significance. The history and origin of Facebook is intrinsically linked to the sharing of photographs on the Internet. Its precursor, the Facemash, created in 2003 by Harvard students, consisted of a website to elect the most attractive student by presenting side-by-side photographs. Initially exclusive to college students, only in 2006 was Facebook released to anyone over the age of 13 with a valid email address. By 2012, the social network was sharing 300 million photographs per day (Kpcb 2013) and it is currently the largest social network on the planet, having reached the 2 billion user mark at the end of June 2017. (Forbes 2017).

In 2010, Brazilian Mike Krieger and Kevin Systrom created Instagram. Initially, it was only available for the IOS system and the practicality of applying filters in the photographs was so successful with iPhone users that, at the time, it compensated for the poor camera. The photographs captured through Instagram were done in square format, in reference to the elitist Polaroid. In addition, it was possible to share the images directly on Twitter and Facebook. It took only 3 months to reach the milestone of 1 million users and 1 year to have 15 million subscribed users. In 2012, the mobile app became available on the Android system and reached 27 million users worldwide (Correia and Moreira 2014). On the same occasion, Facebook founder Mark Zuckerberg disbursed \$1 billion to purchase the Instagram brand and declared "For years, we've focused on building the best experience for sharing photos with your friends and family" (The Guardian 2012). In 2017, Instagram reached 800 million users.

On Instagram, hashtag was consecrated. Originated on Twitter, it consists of an indexing mechanism that allows the user to create a hyperlink with similar content.

In mid-2008, Twitter, one of the main social media networks, established the indexing system called 'trending topics', a tool that allows the grouping of posts by topic, articulating certain words, phrases or expressions preceded by the hashtag symbol "#". (Moura and Mandaj 2014, 6, our translation).

More than a billion people in more than 180 countries use the WhatsApp messenger to keep in touch with family and friends through their smartphones. In addition to being a social network, this mobile app released in 2009 changed the way people use the cellphone to communicate. People started calling less and less and sending messages more and more. Not only because it is cheaper but also because of the features that improve communication, such as sending photographs, movies, text documents in various extensions, location on the map, links and so on. And with the advantage of being able to do this in groups of up to 256 participants. Due to the high cost of mobile phone services at the time of its launch, adherence to WhatsApp was so great, that telephone companies had to re-adjust their billing plans to remain competitive in the market.

Another social network that brought disruptive innovation to the virtual relationship was Snapchat. In this mobile app, users, equipped with interactive editing tools, send photos and videos to a friend and program the time the images will be visible – at most 10 seconds. After this time, the images are automatically deleted and cannot be viewed again. If a follower takes a screenshot, to copy the image, the user who sent the image is notified. This volatility in information is a paradigm break because it removes the memory recording function of photography, which in this context is only a communication tool. This mobile app was very successful with the youngsters due to the possibility of exposing the content to specially selected users for each snap and without leaving a trace. The success of Snapchat was so great that Facebook, inspired



by this way of communication, created *stories*, a profile status where users can upload photos or videos that are available for viewing by friends and followers for up to 24 hours. Facebook also made *stories* available to its other social networks, Instagram and WhatsApp, exponentially increasing the amount of photographs that are intentionally deleted every day.

Flickr is a web site hosting and sharing images like photos, drawings and illustrations. Launched in 2004, it innovated in the treatment of digital photographs by allowing new ways of organizing photographs and videos. Characterized as a social network for its high level of interactivity with users, it adopts the popular categorization system of files through *tags*, which are considered a form of metadata, attributed to the respective photographs by the users themselves. Thus, the search of images becomes an easy and agile process. The site offers a list of tags to be assigned, providing an indexing experience for the users. In addition to allowing the user to create their own tags to index photos and thus benefit from folksonomy, defined by Moreira González (2011, 46) as a cooperative indexing that adopts keywords to represent information spontaneously and freely, Flickr also allows users to organize their own photos through albums and group them into collections.

Released in 2010, Pinterest is a social network of image sharing that works as a framework of inspirations and ideas for a multitude of subjects and categories. The proposal is that the platform resembles a frame, where they fix the things that the user likes the most, known as *pins*, that the user can group into collections known as *pinboards*. Pins are classified into very varied pre-established thematic categories: recipes, crafts, travel, photography, pets, marriage, etc. These categories help in the search and retrieval of content, allowing users to organize the inspirations they find on the Internet to be accessed in the future, as well as share with other users. In addition, the user can follow specific subjects shared by other users, without necessarily seeing all the shared content, as in other social networks. This demonstrates that knowledge organization can contribute to the organization, diffusion, search and access of photographs in social networks.

### **Indexing photos on social networks**

According to Slype (apud Araújo Jr. 2007, 21, our translation), indexing “is the activity that consists of representing the content of a document or an analytical query, that is, enumerating concepts and / or words”. Araújo Jr adds that the conversion of the language of the document into a documentary language will involve the analysis of the document by the indexer, in order to identify and select keywords that may represent the content, so that the document is later retrieved. (Araujo Jr. 2007, 21).

When this involves photographic documents, there is a need to transpose the visual into the verbal. Smit (1996, 29) states that the representation of a photographic image

cannot be a simple automatic transposition of documentary analysis procedures developed for the text, because the statute of the photographic image is different from the text and because the use of the photographic image is not only due to its informational content, but also because of its photographic expression.

Among the different approaches to knowledge organization, the authors Brandt and Medeiros (2010, 114) believe that folksonomy can be analyzed as a scheme of knowledge representation centered on the user because it has two of the main characteristics of this approach. The tagging process that generates the system terms is totally carried out by the user and another essential aspect is that the term is chosen by the user.

Although folksonomy falls short of the principles of knowledge organization due to polysemy, lack of controlled vocabulary and other factors, we cannot rule out its importance in the process of representing information. Analyzing theoreticians like De Mai, Hjørland, Foskett, among others, the authors (Brandt and Medeiros) believe that no other form of knowledge representation is as directly linked to the cognitive world and to the needs of the user as Folksonomy. On this, Ferreira points out that:

People who use the networks to publish their photographic content feel, while the information professionals seek, objectively, to date, allocate and narrate the events. One is not more important than another [...] both are important and may also be allies in the process of representing information (2017, 11, our translation).

Considering the polysemy of meanings that a photograph can assume, the hashtag, allied with folksonomy, assists in the understanding of photography from the point of view of the producer, and whoever shares the image. Ferreira (2017, p. 2) defines the photographic image as a composite language that can trigger several objective and subjective readings and interpretations. In fact, photography, when presented without a caption, can be interpreted in many ways by different individuals, or even by the same individual at different times of his life. However, the photograph, tagged by the author himself, carries a production context that guides the viewer's interpretation to the message that the author wants to convey.

### **Analysis and results**

The questionnaire showed that the same promising scenario for photograph diffusion and retrieval can be very dangerous when it comes to memory preservation. Out of 2,126 respondents 1,336 (62.9%) reported having lost photographic records due to social network extinction (Fotologs, Orkut, and so on). Despite this, they continue to trust the custody of their photographs to the social networks on the Internet. 50.8% of users, 1,081 respondents, said they have photographs saved only in social networks, without backup in their own support. In addition, the number of photographs produced with the intention to communicate rather than to save, grows every day. The feature of

photography as a communication resource has recently gained prominence with Snapchat and all indications are that it will be increasingly exploited, as several social networks have adopted the *stories*, inspired by Snapchat. The questionnaire revealed that 33.7% of social network users use Snapchat and 71.9% share photographs in stories. However, more than 40% stated that they do not save this content that will be automatically deleted in 24 hours, corroborating the idea of using photography as a communication tool without the intention of recording memory.

In this context, more care must be taken in the treatment of photographs that one wishes to preserve, so that they do not get lost among the others. With the constant increase of connection speed and space availability on the Internet, the amount of photos uploaded and shared has increased exponentially. Thus, it becomes increasingly difficult to find a photograph without the aid of any tools. 51.3% of the respondents stated they already had difficulties in recovering a photograph and they gave up looking for the picture before finding it.

Indexing is an important photograph retrieval tool for social network users and, in a way, assists in the personal and collective memory maintenance until more accurate technologies for retrieving image content are developed. Until then, it would be interesting to guide and educate users on how indexing can be a tool in the present, assisting in communication, representation and organization and, in the future, in the recovery and access to photographs and memories.

70% of the questionnaire respondents reported using hashtags for various purposes, and 66% of them use it when sharing photographs. Among the purposes of use, 18.2% use it with the intention of creating an access medium to the photograph through a search, 18.4% use it with the intention of linking the photograph to other similar ones, 30% use it with the intention of describing the photograph, and 25% as a language resource; a way to express themselves. The low percentage of hashtag usage as a photo recovery tool is confirmed by almost 35% of respondents who declared they do not consider it advantageous to use hashtags in indexing photographs and the 13% who declared not knowing how to use the hashtags.

These results demonstrate the need to clarify to social network users the advantages of conscious indexing for photo retrieval. An interesting fact is that the use of hashtags on Instagram (71%) surpassed the use of hashtags on Twitter (23%), the network responsible for inserting indexing through the hashtag in social networks. This shows there is more interest by social network users in giving some kind of treatment to their photographs than indexing other content on the Internet.

## Conclusion

Due to the large amount of photographs on social networks on the Internet, and the increasing number of photographs that are intentionally lost every day through *stories* and apps like Snapchat, we observed a change in the way photographs are used on the Internet. Increasingly used for communication and less as a record of the present to be revisited in the future.

We observed that social networks are introducing knowledge organization instruments into the daily lives of users in a natural and progressive way to meet the demand for photograph recovery and, consequently, demonstrating to society the value of knowledge organization for information management and preservation of social memory.

Folksonomy was decisive in this process because, by allowing the user to freely classify information, it ensures the best description of the production context and that the content will naturally be related to words that users believe to be linked to them, that is, the words that are most likely to be used when searching for certain content. In this way the platform moderator is freed from having to master or have in-depth knowledge of all subjects.

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