

Keyimages ontologized for the Cultural Masses

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Abstract. Humans name things. Naming is essential for pointing to recognizable images, sounds, and emotions. In every culture throughout history certain stereotypical images have emerged to indicate grounded truths for the people. Today, where images are ubiquitous in their billions, available for use at a price, it becomes important to provide a balancing counterpart of high quality, royalty free images, under an appropriate creative commons licence. In addition to the usual folksonomical tagging it is recommended to have, in addition, a formal support vocabulary for which there is an appropriate formal reasoning system. In this paper we continue the pragmatic exposition of the CIDOC Conceptual Reference Model, supported by the Erlangen OWL encoding, and exercised through the Protégé editor. Examples of keyimages are drawn from Television programs, online Art Galleries, and ordinary printed photographs. Vocabulary data are normally provided in both Bulgarian and English. Data in other languages, such as Gaeilge, French, German and Russian, are entered as needed,

Keywords: ambiguity, digital re-discovery of culture, folksonomy, keyimage, ontology, QR code, tag

1. Introduction to fruitful acoustical ambiguity

“I am watching Barnaby. I see a chestnut tree. I see the leaves have turned. I know it is autumn.” [Михал Орела, 20110126]

The quoted text, intended to be spoken out loud, is linguistically insular. It refers to a television episodic event, broadcast in the Islands of Britain and Ireland. It is quite possible that the same event has been experienced in other “English-speaking” countries, such as Canada, Australia, United States of America (USA), New Zealand and South Africa. Culturally (in translation), it is probably not as meaningful in Bulgaria, Russia, France, Germany, and so on. It might also be not very meaningful to most people in the USA.

The context of the quote might easily have been a real event witnessed by the speaker. The key word in the text is “Barnaby.” It is marked out by the capital letter “B.” In English, a large choice of meanings for “Barnaby” is provided by Wikipedia [1] and there is a specific page for the role “Tom Barnaby” [2]. In other words, as to be expected in natural language, there is a considerable amount of *ambiguity of meaning*. At the time of writing, there is no Bulgarian Wikipedia equivalent for Barnaby. That is not surprising given the ethnographically insular

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nature of the name. Using a standard transliteration into Cyrillic Bulgarian: Барнаби, gives some interesting search results. However, doing a Google Image search on “Барнаби” brings up results immediately meaningful to me. That is to say, I recognize the “Barnaby” I have in mind from those image results. I am so used to “Barnaby” that I have forgotten, almost, that he who plays the Barnaby role, is really called “Nettles.” And “Nettles” is another kind of ambiguity.

It comes as a surprise to me, therefore, to learn that the actor John Nettles (Джон Нетълс), who has played the role of Barnaby, has his own Wikipedia page in Bulgarian [3]. And on that page, I am reminded that in addition to playing the major role in “Убийства в Мидсъмър” (Midsomer Murder) [4], he also played a similar major role in another detective series, “Бержерак” (Bergerac). This series I have also seen a long time ago. One is curious, therefore, to learn more about the latter. Googling with “site:bg Бержерак,” specifically to eliminate Russian (and other Cyrillic) sites, one ought not to be surprised that it is “[Сирано дьо Бержерак](#)” that comes to the fore rather than the television series “Бержерак.”

Proper names usually are untranslatable from one language to another. The meaning is in the sound, not in the writing. In practice, we use the CIDOC Conceptual Reference Model [5] as ontological basis and encode the key terms (and associated key images) using the Erlangen OWL encoding [6]. Now the question is this: how shall we ontologize the text quoted in the introduction? From the discussion above, it is clear that the ontologization can not be fully automatic. There is too much *ambiguity*. That essential ambiguity is, of course, the foundation stone of folksonomy [7]. Half way between the formal ontology [8] and the folksonomy is that space occupied by WordNet [9], and for illustration of same, ImageNet [10]. But we shall not rest there. We will also want to connect with the more formal ontology framework provided by, say the CIDOC Conceptual Reference Model (CIDOC CRM) [5] designed specifically for Museums and in practice we will use the Erlangen CRM/OWL variant [6], supported by the Protégé-OWL ontology tool (version 4.01 beta) from Stanford Center for Biomedical Research [11].

1.1 Encoding the person “Barnaby”

The current manual for the use of the CRM runs to 167 pages. Clearly, if one is using the CRM in its usual fixed working context of Museums, Art Galleries, and so on, then one becomes expert in developing the ontology. With constant practice on the same sort of material, the work becomes routine. It is more challenging to use the CRM to develop an ontology for a “moving target,” in our case, a wide variety of unfettered images. Fortunately, the Erlangen encoding provides CIDOC CRM information dynamically online in the Protégé editor. Here is the first entry for “Barnaby.”

E82 Actor Appellation: Barnaby, Tom Barnaby, Inspector Barnaby, Inspector Tom Barnaby, Барнаби, Том Барнаби, Инспектор Барнаби, Инспектор Том Барнаби. The above are some of the names of the role “Barnaby” played (originally) by the real person John Nettles:

E21 Person: John Nettles, Джон Нетълс.

Now, as it turns out, John Nettles has retired from the role of Barnaby in early 2011 and a new person, Neil Dudgeon [4], will play the role of Barnaby in future [12]:

E21 Person: Neil Dudgeon, Нийл Дъджън.

Originally, I had thought to present an image of Barnaby which would, of course, be a picture of John Nettles in the role of Barnaby. Such an image would key both the character and the actor all at once, or so I had thought. And for this reason the image would be called a keyimage. Now I will need to have two dated keyimages, one for each actor, dated with respect to the duration of the role played.

1.2 Encoding the chestnut tree.

Let us assume that the phrase “chestnut tree” is well known [13]. In place of looking up the name first in Wikipedia, let us do an image search, this time using ImageNet (currently only the nouns of WordNet [9, 14] are pictured) [15]. Not only do I get images I recognize, I also discover that there are many different types of “chestnut tree” [16].

E20 Biological Object: chestnut tree, кестена

1.3 Encoding the dynamic transformation of the turning of the leaves

Finally, the phrase “leaves have turned” has a very special meaning in English. One can turn the leaves of a book. One can turn the fallen leaves lying on the ground. But, the real meaning of the phrase in the given context is the turning of the colour of the leaves from green through orange to brown, signifying death. Thus, we deduce from the last sentence in the quoted text that the turning is due to “Autumn.” And I suspect that this “Autumn” is in the Northern Hemisphere. Were it to be in the Southern Hemisphere, then one would go back to the ImageNet to check to see, if indeed, there was a match. And if there was? Then one would have to broaden the framework of investigation, from “chestnut tree” to surrounding terrain, to other things in the background, registered through the eye to the brain. ImageNet encourages and supports such broadening. The ambiguity enriches the human experience but confounds the computing experience. Specifically, there is a triple ambiguity to the act “turning of the leaves.”

E81 Transformation: turning of the leaves, смяната на цвета на листа (translation, courtesy of Google Translate); we will use смяната на листа in the Protégé encoding to provide expected ambiguity. Note that we deliberately preserve the definite article in the Bulgarian version and omit it in the English version. Consistency is not an issue.

2. Story telling of Snow’s Two Cultures Reuniting

In very recent times, at least in the Anglo-Saxon world, there has been a crushing of the Humanities in favour of and by the Sciences. One of the ways in which the

Humanities fights back, is by means of the emerging discipline of the so-called “Digital Humanities.” We can “date” the separation of knowledge into Sciences versus Humanities back to C. P. Snow’s seminal work, “The Two Cultures and the Scientific Revolution” [17-19].

Even more significant than the current perceived impact of the “Digital Humanities” was, of course, the revolution in “formal” language, which underpins and defines what we call the “Computer Revolution.” The programming languages (and here we ought to start including those occurring in the Sciences, such as the genetic code [20]) devised by the Computer Scientists clearly denote the bridges. From one side, there is clearly the science; on the other side there is the language, albeit currently formal. And the development of the “programming” languages seems to be never ending. Thus, although the traffic has appeared to be mostly one-way from Science to Humanities (and thus the emergence of the Digital Humanities), we begin to see traffic in the opposite direction (from the Humanities to the Sciences), epitomized in our times, perhaps, by the image recognition abilities of Google Goggles [21].

2.1 Picture me this



Figure 1 Irina with the children

The word folksonomy does not seem to be popular today in 2011. One is not likely to talk about folksonomizing an image. On the other hand, the action of tagging an image, whether on Flickr (or similar image hosting site) or in an online Gallery, is deemed not only acceptable but socially supportive. Happily, in an era of Cloud Computing [22], the concept of a Tag Cloud [23] has a home.

Let us begin with a keyimage, shown here. The title (in Bulgarian, above and in English, below) is deliberately included. Just as in the case of “Barnaby,” here we recognize “Ирина”/“Irina.” Knowing nothing else, I can point to Irina without hesitation. I also assume without thinking that Irina is the mother of the children in question. But Irina is a very common name. Whether searching with English or Cyrillic characters, one will not (easily) find a

match for this image. There are many mothers called Irina. If one is then told that the mother Irina had a boy by the name of Пенчо Петков Славейков, then all is revealed. We can now extend “Ирина” to “Ирина Славейкова.” It is known that Пенчо was the youngest son [24]. Is that he in the centre of the picture?

To illustrate the effect and potential of social tagging of art works with respect to significant Cultural Heritage Institutions in Ireland one might begin with the Royal Irish Academy's Digital Humanities Observatory (DHO) [25]. Currently materials online may be accessed via 4 distinct types of filters: image, sound, text and video. Here we focus exclusively on the use of the image filter. Let us begin with the Chester Beatty Library Image Gallery [26]. I have chosen a very striking colourful



Figure 2 The Queen of Sheba

image, entitled “The Queen of Sheba” [27, 28]. Formally, it is entitled “Makeda, Reine de Saba”, *Chronique Ethiopienne*, by Georges Barbier [29], 1914, Paris, France. At the time of writing there were 6 tags assigned to the image in the Chester Beatty Library: woman, fruit, colourful, queen, blue, жена. All were added by me, the author. This picture, being located in a very special renowned Gallery, will become for us a *multipurpose* keyimage. In the first instance, it unlocks the story of the Queen of Sheba. In addition, the striking nature of the artwork points to the painter himself. In other words, this picture is a keyimage for (the artwork of) Georges Barbier. In other words, to look at “The Queen of Sheba” is to be pointed in the direction of the artist himself. Formally, the ontological recording of the artist might take the form
E21 Person: Georges Barbier, Жорж Барбье (respectively, French and Russian).

3. ImageNet (a là WordNet)

One of the *classical* ways in which to find a painting or an image is to search by (approximate) name. In other words one uses a vocabulary of words (tags) which are presumed to be notionally attached to the image in question. In ImageNet there are three ways in which to explore images: WordNet structure, Cloud Map, and Most Popular.

Another new way to find “interesting” paintings and images is to use Google Goggles [21]. If there is an exact match then one or more relevant webpage urls will be returned. It is also interesting to note the images returned when there is a

mismatch! Such mismatches often force one to see how Goggle Goggles picks up on specific features of the mismatched image.

Now there is a third paradigm. Given an image (or its url) as before, one can “reverse engineer” and find “matches” [30]. The name is TinEye. The picture of “Irina with the children” was submitted on 2011-04-19 with the result: **0** matches and having searched “**1.9532 billion**” images. It is quite possible that the image does not appear online anywhere. This suggests an opportunity for a little experiment to be discussed below in the context of the Flickr Gallery experiments presented in the following section.

4. Cultural heritage and the online art exhibition

Let us begin with the visual phenomenon of the QR code [31, 32]. It turns up in all sorts of places. For example, it is used for Rose of Bulgaria product news [33] and the Real Estate Portal in Bulgaria [34].



It is a natural phenomenon that confronted with a picture in a gallery, the observer upon seeing a labeled caption, will go and read, and then, furnished with information, spend some time trying to see how the picture matches up to what has been read and understood. One can block such a reading, by replacing the labeled caption with a QR code. To access the information, one must first decode. It is hypothesized that the observer will spend much more time reading the picture directly before making the extra effort to decode. To test this hypothesis one might conduct a simple repeatable experiment. Let us imagine we have a collection of self-portraits that we wish to exhibit.

1. Upload the self-portrait image to Flickr;
 2. Grab the corresponding unique Flickr address and convert it to a QR code; the result is a unique **E38** image [35]. Any smartphone equipped with Google Goggles [21] can go directly through the QR code shown to the left and see the self-portrait in question.
 3. Compose a new image consisting of the self-portrait and the QR code;
 4. Upload this new composition to Flickr; (See, for example, Ж [36]).
 5. There is a gallery feature on Flickr which can hold up to 18 images. However, a Flickr member cannot install her/his own images in the gallery. To achieve the goal one creates a second Flickr account (with a new identity) to host the gallery. One might formally name such a second identity as the Flickr *assistant*.
- A prototypical Flickr art gallery collection, entitled “Автопортрет” is online [37].

5. Wikipedia and (Bulgarian) Art

At the time of writing (19 April 2011) there were [115 497](#) Wikipedia articles in Bulgarian; articles in English, French, and German were each in the order of millions. Let us focus on those articles concerning Bulgarian artists, and especially on those who are painters. A typical choice might be Иван Ангелов (Ivan Angelov, also Ivan Anghelov) 1864 – 1924 [38]. To augment the text of Wikipedia one might search using the terms Иван Ангелов художник. The latter term художник is particularly useful since Ivan Angelov is a popular name in current use. The results are interesting. Top of the list is the Wikipedia article. There then follows a bunch of Bulgarian websites who use the name “Иван Ангелов” just to get attention. Fortunately, there is an excellent Russian site which gives a very good biography [39]. The Google translation to English is excellent. One presumes that the Google translation to Bulgarian is also equally excellent. The book on “South Slav Dialogues in Modernism” [40] also contains some images of and remarks on his work.

There is clearly a need to boost the presence of Bulgarian Art and Artists on Wikipedia. This would require the support of the Art Galleries (both public and private) and the Private Collectors. It is a well-known fact(?) that the majority of art works in any Art Gallery (up to 60% or even 80%?) are in storage, often to the detriment of the works in question.

Digitization of the art works is a first step. Ontologization (using say the CIDOC CRM) is a second step. Then promotion of the digitized art works online provides opportunity for the people, the cultural masses, to see something of their own heritage. If such promotion is done only through the official online Art Gallery sites then a small percentage of the cultural masses will visit. The real impact will only be accomplished by accident. In other words, one tries to devise a way in which the art will be stumbled upon. Wikipedia provides one such means for accidental exposure.

The Flickr web site is also a significant place where Bulgarian Art is encountered. For example, a search for “Ахинора” will return 8 images. “Ахинора” is a keyimage, not only for Иван Милев, but also for Bulgarian culture at a certain time and place in the early 20th century. What/where are the important keyimages for Bulgarian culture in the early 21st century?

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