

If a picture is worth a thousand words, then...

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Images are being recognized as an important method of information transfer. Image indexing thus warrants the same kind of serious attention that is given to text analysis and indexing. Levels of analysis, the interpretation of relationships between the elements in an image, and appropriate vocabulary are the central problems. Commonsense guidelines such as rigorous vocabulary control help, but the essential factor is that image storage and retrieval must be valued.

The following is an overview of the social role of images and of the central problems in image indexing. For this purpose *image* has a very broad definition, including photographs, films, clip art. However, technical images such as x-rays are clearly less problematic, and some of the comments would not apply. Similarly, art images require a whole other level of analysis, and although there is an overlap, art indexing poses another set of challenges.

Usually, image indexing involves more than just subject. For example, camera angle, time of day, film genre, and intended audience, are often considered, in addition to location and other types of information that are not necessarily easily identifiable in the image. This discussion focuses on subject access, but does not exclude these various non-subject and para-subject aspects.

Images as Information

During the past thirty years the management of images as *sources of information* has gained considerable legitimacy. This is not to say that prior to this time images were never taken seriously. However, it is probably safe to say that the managed use of images has been democratized. It is no longer the fairly elite domain of art historians or specialized archives.

I grew up with text as a primary mode of information acquisition; my children are growing up with images, images that appear on television, on videos, in magazines. Where I read *National Geographic* and Gerald Durrell, they watch the same. They watch films in the same way that I read books — fiction, non-fiction, the good, the bad, and the indifferent. Not that they don't read, but the role of images is much, much larger in their life. And, if we believe that old adage about the worth of an image, the impact of those images is enormous in terms of information transfer.

Perhaps we can even speculate that we are in some ways returning to our roots. Prior to the widespread use of writing, everyone depended upon interaction with other people (voice, body language) and with their environment (myth, culture, physical environment, nature) to acquire information. Humanity did not place a large dependency on a unidimensional method of communication. The reintegration of visual media into the main stream of communication may be an instinctive response to this unidimensionality, a recognition that written words are not enough, and that pictures are not just for children.

All of this poses a problem, for if we recognize the legitimacy

of images in information transfer, then we have to really question ourselves about how serious we are about providing access to images. Let's face it — a lot of what we do now is fairly experimental. We make assumptions about how images will be used and, governed by the mindsets and rules that have been used for text, we gaily (or not so gaily) sally forth to create systems that may or may not work. Sometimes the experiments work very well, but often enough they treat images like the poor relations of the information world. After all, if the information isn't 'real', why waste money and time providing it with the types of accouterments we would take for granted for text.

Subject access

Part of providing serious access to information is providing subject access. We know that in the case of textual materials access is very commonly by subject. We have designed into our systems various types of subject approaches to meet these needs: subject headings, indexes, descriptors, classification numbers, etc. There is a long history of subject access. But this type of access is not routinely provided for visual materials. There may be a number of reasons for this:

- perceived lack of legitimacy, as noted above;
- the media themselves do not allow for the easy incorporation of the access points, as in back-of-the-book indexes;
- the difficulty in defining subject when 'a picture is worth a thousand words'.

The indexing of images can even be compared to the indexing (at both book and index level) of novels. Is the real reason we don't usually 'do' novels not so much because they don't need to be indexed (which is the reason you usually encounter), but because they are difficult to analyze? Yes, novels suffer from a legitimacy problem too, but there is something extremely convenient about finding that the material that is the most difficult to analyze is the one least needful of being analyzed. Are we just propping ourselves up here? Are we doing the same thing with visual materials?

Why is the analysis so difficult?

When discerning meaning in text we consider both the denotation and the connotation of words, and we consider the meaning projected by the grammatical constructions. We are concerned with getting it right, but because the rules are fairly

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clearly defined, we usually proceed with confidence. And to make it easier on ourselves we have institutionalized the avoidance of text with layered meanings — novels.

Images, on the other hand, are usually absorbed holistically by the viewer. We have only to think of the role of subliminal suggestions in advertizing to see how true this is. We don't have the easily available dictionaries, glossaries, grammars, etc. to provide the structure for analysis. Like novels, they appeal to feelings and we are often looking at our psychological responses when we discuss meaning.

If we look carefully at how we analyze images we come up with the following problematic areas:

1 Levels of analysis

The first aspect that must be considered is the levels of analysis. Panofsky defined three levels of meaning in visual materials: pre-iconographical, iconographical and iconological. The first two correspond to the concepts of 'ofness' and 'aboutness' that appear in the subject access literature. Ofness relates to the identifiable objects, people, or events in the image. Aboutness requires the analysis of what is happening in the image; it is an interpretation of meaning and will be partly based on viewer interpretation. Panofsky's third level relates to symbolic interpretations of the image and requires extensive cultural knowledge. It would be reserved for the domain of art history and similar types of image analysis. (For discussions of these concepts, see Panofsky, 1955; Shatford, 1986.)

To illustrate the basic difference between ofness and aboutness, here is a clip art example.



At the ofness level these are two wineglasses, and can be described as such. However, on the disc from which the image was taken, it was grouped under an abbreviation for 'Celebrations', clearly an aboutness concept. The file name referred to 'Glasses', taking care of the ofness. (Note that this degree of indexing in a clip art file is not the norm: often the file names are just numbers!)

Access at the ofness level is fairly easy to provide. Look at the image, choose descriptors that reflect the objects, people and events, and that is that! However, this is the equivalent of computer indexing of text, where word occurrence defines the indexing. It can work well in some contexts, when user requirements are very basic. However, *aboutness questions cannot be answered by ofness indexing because there is no overlap of question and answer.* This means that a level of

interpretation must be incorporated into most image indexing. Now, this really is not radical — we know that fine *text* indexing requires analysis and interpretation. If it did not, we would not be so concerned with avoiding misinterpretations. And this is why computers are not very good at indexing.

Another example:



At the ofness level this is a stork carrying an elephant, and its file name was 'Stork'. It too was listed as a 'Celebration', which would be a broad term referring to the birth of a baby. This is an excellent example of something that would be thought of in the abstract and is viewed in the abstract. The meaning is dependent on cultural knowledge.

Unfortunately, the nature of visual communication as a more holistic method means that the range of aboutness interpretation may be quite wide. And this makes us, as indexers, quite uncomfortable. It is a big responsibility!

So, there is a tension between the relative ease of providing ofness level indexing and the complexity of aboutness indexing.

2 The focus on relationships, processes

Another issue that is very problematic with image analysis is that while we can describe the elements of an image, it is, in fact, usually the relationship between the elements that provide the meaning at the level of aboutness. In the example with the stork, it is not the stork by itself or the baby elephant by itself that is important. It is the fact that the stork is delivering the baby elephant in a package that indicates the meaning (arrival of a new baby). It is the process that is paramount for the analysis of meaning.

Again, this can be compared with novels. In novels it is the development of the plot and the relationships that is the vehicle for meaning, not the elements in isolation.

The relationship problem is even more complex for moving images. The time dimension affects meaning, but in a difficult-to-define manner. The juxtaposition of images creates

meaning. Then there is sound, and the interaction between sound and image.

What happens when the film is taken apart, as in stock shot collections? This should simplify things. In these types of collections unused footage is saved/sold for use independent of its original purpose. The ofness level of access is primary, because the aboutness level is at least partially defined by the new purpose of the footage. Aboutness needs still appear however. The analogy here is to back-of-the-book indexes. Simple indexes that focus on the easily-defined concepts that appear in a text are often judged sufficient by users whose needs are simple. However, if a user has more complex needs, the deficiencies of the index become clear immediately.

3 Vocabulary

Clearly one of the biggest challenges in choosing the right words to reflect the subject matter is simply figuring out how to name the objects, people and events, even at the ofness level. At this level it would seem easy enough, but in fact there is considerable diversity in vocabulary between individuals, even within a fairly homogenous group. Consider the variations in language usage across different parts of the world, even from one end of a country to another. (For further discussion of the vocabulary issue, see Turner 1994.)

The relationship issue also creates a vocabulary problem because we do not have good tools for naming and describing processes. Subject headings, descriptors, and classification schemes include attempts to purvey these types of concepts, but for various reasons, including brevity and lack of rigour, results are less than satisfactory. Precoordinate vocabularies are inflexible and difficult to control cleanly. Postcoordinate vocabularies leave most relationship definitions to the users.

Systems such as PRECIS, COMPASS and other string indexing systems that allow the indexer to focus on the relationships can be extremely useful. However, they are generally more costly and the indexing and retrieval are complex.

What to do?

Accept the legitimacy of images and encourage our colleagues in the information world to treat them seriously. This is paramount. The following are commonsense suggestions to consider when facing an image-indexing project.

- 1 Familiarize yourself thoroughly with the intended audience. This may be difficult in the case where there is not already a known user group. For any particular collection, ensure that you are familiar with how the images are requested and used. It may be in some cases, such as stock shots, that the ofness level of access provides pretty well all that is needed. However, in many cases aboutness requests will creep in and the system needs to have some method of accommodating these needs. Without a clear definition of who will use the system and how they will use it, there is little hope of dealing with the problem of levels adequately.
- 2 Use rigorous vocabulary control. Thesaurus design and maintenance is expensive, but without it a vocabulary

that is stimulated by images will quickly grow out of control, and indexing and retrieval will suffer.

- 3 Establish policies about levels of indexing, so that indexers will choose to index at the aboutness level under fairly consistent conditions.
- 4 Develop analytical frameworks that prompt the indexer for the various aspects of the subjects. Subject analysis is just about the most difficult part of indexing, and it is even more so when dealing with images. The frameworks should highlight the appropriate level(s) of indexing and guide the indexer in analyzing relationships. They should also be geared to the user needs. For example, it is possible to use a PRECIS framework, which prompts the indexer to analyze for processes as well as such non-subject aspects as point-of-view, even if PRECIS indexing is not used.
- 5 Encourage research and experimentation and encourage evaluation and discussion of the results. The new technologies are providing us with tools that we are only starting to understand. We need to experiment and to test results. We need to see more case studies and discussion in the literature.

Valuing image storage and retrieval

There is certainly plenty of work being done with images. The ease of image digitization means that effective storage and retrieval of images is far more feasible than it was. CD-ROM and Internet projects abound. There are more and more projects where image retrieval (and therefore indexing) is considered commercially sound. However, it would seem that part of the struggle is to convince managers of such projects that it is worth hiring someone who knows what s/he is doing. Does this sound familiar? So perhaps it is a double struggle: one, to value the retrieval of images and two, to value the knowledge that indexers bring to image storage.

References

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