Ceci n'est pas une pipe
indexing of images

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Introduction

> "Images are not phenomena of art history proper but phenomena of interpenetration between art, politics, moral philosophy, historical thinking, literature and religion". The following statements, which are more like proverbs, are even more well known: "An image is worth more than 1000 words", "To describe an image one needs each of these 1000 words", and "1000 words to describe and index an image are seldom cost effective".

In libraries, archives and documentation centres and to a lesser extent in photo archives and photo bureaus the description and indexing of images (reproductions, original pictures, digital images or -reproductions) is regarded by many as a difficult problem. Furthermore many libraries -at least until the recent past- consider images as material inferior in standing and documentary quality to books, reports and journals. Illustrative is that images are commonly called 'non-book material'. One reason might be that library and documentation tradition is based upon written material, as our culture still is based upon script, although a shift towards more emphasis on images is discernable. Also reproduction methods for text have a longer standing and have been for long cheaper and better than those for images. However, due to cultural and technological changes images are attracting more attention. Another reason is that libraries, in particular the larger university libraries, have concentrated for long on the 'outside' of documents or on documents as a whole, neglecting the 'inside' and relevant parts (including illustrations) of documents (books, reports). Documentation centres by tradition concentrate more on the 'inside' of documents. In order to appear not too negative about it, it is appropriate to mention the fact that a well-known person in documentation, Paul Otlet, in the beginning of this century already wrote about the use of images/illustrations (6), and that in 1917 Morey began the Index of Christian Art (19).

We are used to dealing with written texts and many methods and tools are developed to process that material. Text documentation is in many ways easier than image documentation as the text itself contains identifiers which are readable by computers, or which can be used in manual systems. Or, as Besser

puts it 'most books are written with clearly defined purposes in mind and a cataloguer can expect that most potential users will approach them from that standpoint'(4). This however would imply that users already have a knowledge of the books to be found, which can be doubted in many cases.

We still have a long way to go for images to be used in the same way. Tools are just now beginning to come on the market but many are still in laboratory stage.

Developments in description and indexing of images

Limiting ourselves to subject indexing of images, a distinct development over the last, say, 100 years can be traced. In the early days subject indexing was done by describing the content of an image in words, and using words from that text or specifically assigned keywords for indexing purposes. From this period stems maybe the remark in the beginning of this paper: "To describe an image one needs each of these 1000 words". No reproduction of the image itself was available, and the user had only text to imagine himself/herself what an image would look like. During the next stage, with the advent of more or less cost effective reproduction means of reasonable quality an image was added to the description. The text still was of paramount importance. The present day shows a shift from text plus image to image plus text. Reproduction methods are of far better quality, technology for recognizing image content is rapidly developing, there is serious doubt whether the "1000 words are cost effective", and last but not least, society attaches great importance to the image. To my opinion an indexing system with only images and no text will be impossible as is also stated by Turner (27), unless artificial intellingence and expert systems really take off. Sofar the promises has been much greater than the achievements in this area. Furthermore, it is doubtful if pattern recognition will work at iconographic, let alone iconological level. Turner indicates one of the causes: it is possible to convert a scanned text to machine readable ASCII but there is no hope that a comparable alphabet may be developed and used for images (26). A search algorithm therefore is difficult to define. However, pattern recognition programmes exist (15, 29), so it must be possible to define at least some sort of alphabet. This is corroborated by reports on databases in the fields of textiles and heraldry. The textile database uses motifs, represented by keywords and images (1) and the heraldry database makes use of elements of heralds and blazons (24). Thiele even points out that heraldry is "a *language* used to visually communicate not only a bearer's identity but many other facts about him". He suggests an algorithm that is based upon colour, shape, inscription and subject (24). Admittedly this is still a long way off automatic pattern recognition of suitable reliability. As an example, the QBIC system (15) will not work properly in an purely art environment. After all, a horse may be depicted in many ways: partly hidden, complete, incomplete, different shapes, different angles, etc.

Methods of subject indexing

It is best to start here with the classic on iconography and iconology in art, the essay by Erwin Panofsky (20). He distinguishes three strata in subject matter:

primary or natural subject matter, divided into factual and expressional. 'It is apprehended by identifying pure forms (...) and by identifying their mutual relationships; and by perceiving such expressional qualities as the mournful character of a pose or a gesture, or the homelike and peaceful atmosphere of an interior.(...) An enumeration of these motifs would be a pre-icongraphical description of a work of art' (20). The identification of subjects is of course highly dependent on the cultural background of indexer and user. A person not raised in Western, christian culture would have a few problems with the factual subject matter, and even more with expressional subject matter, when looking at a painting of a mourning lady in a church, holding a cross, while a dove comes flying to her.

secondary or conventional subject matter. 'It is apprehended by realizing that a male figure with a knife represents St. Bartholomew, that a female figure with a peach in her hand is a personification of veracity (...) we connect artistic motifs and combinations of artistic motifs (compositions) with themes or concepts (...). The identification of such images, stories and allegories is the domain of what is normally referred to as "iconography" (...)' (20).

intrinsic meaning or content. 'In thus conceiving of pure forms, motifs, stories and allegories as manifestations of underlying principles, we interpret all these elements as (...) symbolical values (...). We deal with the work of art as a symptom of something else (...). The discovery and interpretation of these symbolical values (which are often unknown to the artist himself (...)) is the object of what we may call "iconology" as opposed to "iconography".'(20).

Panofsky was writing about art history, more in particular about Renaissance art. This should be kept in mind, because it is difficult to imagine that the average photo documentation service could make full use of these tripartite categories and at the same time work cost effective. Enser reported that pre-iconic and/or iconic categorisation (as he calls it) of visual material would not be readily translated from a fine art context to a general, commercial environment such as the Hulton Deutsch collection (9). Instead he introduces the concept of uniqueness as a means of categorisation. The example he uses is the 'concept' of *a paddlesteamer*, or better *paddlesteamers* as opposed to *the Medway Queen*, a particular paddlesteamer. The source of difficulty for applying Panofsky's pre-iconographic and iconographic categories to images in the Hulton Deutsch collection 'lay in the fact that requests cast in the form of generic concepts were rarely encountered' (9). When trying to categorise requests according to 'uniqueness' or 'non-uniqueness', they fell quite naturally into either of the categories, but both classes were subject to refinement (technique used, camera standpoint, etc.). Thus Enser arrived at four categories: non-unique and non-unique refined, and unique and unique refined. He also holds that subject indexes and classification schemes in the field of art history tend to emphasis secondary subject

matter to the virtual exclusion of primary subject matter. Searching in this area is limited to those trained in iconography (10).

Turner (27) describes another concept which he used in a research study: ofness and aboutness. These two concepts relate to Panofsky's first and second level indexing (pre-iconographical and iconographical) analysis, ofness being 'what is it of' and aboutness 'what is it about'. Personally I normally am in favour of such simplifications as in many instances they turn out to be workable. In this case however some confusion may arise with the widely accepted concepts of 'aboutness' and 'meaning'. According to some definitions aboutness may be defined as a function of the document content, and meaning as a function of the actual use of the document (3).

Turner complains rightly that 'specialized indexing languages can be applied succesfully to specialized collections, and especially collections of works of art, but the problem of a standardised indexing vocabulary for non-art pictures (...) is a formidable one because a general vocabulary is needed' (27).

Seemingly turning away from the discussion on uniqueness, meaning, ofness, Rorvig (21) describes a statistical method to extract from a series of moving images the most relevant ones. Images are reduced to series of digits, indicating colour, shapes, angles, measurements, etc. The description may lure the reader into believing that all problems are solved, but indexing of the images is still done manually.

Systems of description and indexing

There is no unity as regards subject indexing, not even in the art history world. It is illustrative in this respect that a recent study without claiming to cover all systems identified at least 34 systems for subject indexing, employed by as many institutions. This survey excluded the Art & Architecture Thesaurus by virtue of the fact that it is not a subject system , but an object classification system (16). It could however be maintained that the AAT (2) is suitable for indexing on the pre-iconographic level. The AAT is a massive work of art, so to speak, which was initiated in 1980 and now contains approx. 90,000 terms. It is one of the many initiatives of the Getty Art History Information Programme, an organisation that is active on the cross section of art history, documentation, computers and imaging.

Mention should also be made of a true iconographic system, Iconclass. Also a system with a relatively short history, which can be traced back to the fifties, and which now comes in 17 volumes or one CD-ROM (30). It is a system used in many of the major art history documentation centres, but it focuses mainly on Christian iconography, and is as such not suitable for general photo documentation collections. Also the system is both pre-iconographic and iconographic of nature. One may find a code for 'thumbs turned up' (31A25 53 1) and for 'virginity' (31A72 11), both in the same main category 31A.

In the same class falls the Garnier (11), a keywords list of a mostly pre-coordinated nature. Its use is not as wide as Iconclass, and is mainly restricted to France and french speaking regions.

Another system is well known by the name of its original author, Chenhall. This system focuses on museum objects, thus concentrating on the pre-iconographic level of indexing (5).

In this context, with so many indexing systems available, it is striking to note that a proposed national system for the inventory of art is tailored at the formal description of a work of art, neglecting almost completely subject indexing and retrieval (8).

Systems like Library of Congress Subject Headings, Dewey, and UDC are skipped here, although some institutions make use of these systems in a sometimes modified or partly expanded form.

As for the formal description (comparable to the bibliographic description of a book), the history is even shorter. Only the last few decades have shown considerable developments in this area, of which the 'Pictorial Representation' and 'Photograph' cards, developed by the MDA in the seventies are good examples. The former card has been translated and partially adapted for use in for example the Netherlands.

The International Standard Bibliographic Description (Non-Book Materials) (18) dates also from the seventies, a clear indication that interest in this topic is of only recent date. These ISBD(NBM) rules have been translated in several languages, and are in use in many libraries throughout the world. Recently the Getty AHIP issued a brochure on the protection of cultural objects. Protection is only possible when data are recorded of the objects. Therefore the brochure contains a minimum data standard for art objects, by nature however not particularly suited for description of images (25).

On the basis of ISBD practice in general, several countries, in particular the UK and the USA developed their own cataloguing rules and format, known as AACR-2, US-MARC and UK-MARC, targetted at the description of book material. IFLA (i.e. the international MARC programme) defined an exchange format between the various existing MARC formats: UNIMARC (28). As it turns out, UNIMARC is not completely tailored to the needs of descriptions of visual material. There are several gaps between UNIMARC and the list of fields which are needed for the description of visual material, e.g. the Pictorial Representation card. Lacunae exist in the areas of identification of the document (function, genre); titles; subject indexing (main motif, position, place, etc.); production data (biographical data, places); copyright; fysical data (dimensions, colour, etc.); local data (acquisition method, exhibitions, etc.); reference to other documents (source, copies, negatives, etc.). However, the structure of UNIMARC in most instances allows inclusion of extra fields (hospitality) (13).

A recent report compares several systems for the description of art objects in use at museums, which indicates that even in such reasonably limited area no consensus is to be found, with the exception of a few elements, such as artist name, title, owner and date (17). The guidelines of CIDOC on the

description of museum objects (12) are a very recent development. It is hoped that this standard will be accepted by the museum community.

National initiatives deserve attention, such as a Dutch development of a common minimum data exchange standard for photographs. This data standard also contains a standardised keywords list which can be used to index photos on a very general level. It is hoped that this standard will be applied over the next few years in the Netherlands and Belgium. Negotiations are in progress to have the standard translated into German and English (14).

A further look at indexing

What is the practice of subject indexing?

Indexing of visual documents as such is much more difficult than indexing of textual information, as the content of a particular image can only be described when using text in addition to the image (26). An aerial photograph of a certain region on which a river is visible may be indexed by 'wooded landscape', 'river', 'aerial photograph'. The accompanying text could well contain information on the country (Germany) and the name of the river (Rhine). Such information cannot be derived from the image itself. Here a strong analogy with the pre-iconographical and iconographical levels can be identified.

Indexing is by nature a subjective activity, and it is even worse when an image is by itself ambiguous. The subject content of for example a painting may be 'of' and 'about' specific, generic and abstract things at the same time. This again is an enormous problem for the indexing system, and even more so for the indexer (10). And then a picture means different things to different people, and it will mean different things to the same person at different times. In the 'classic' library and documentation world we have learned (?) to live with inter-indexer or intra-indexer inconsistency and subjectivity, but because images have the appearance to be very specific in nature (there is something to be seen after all!) keepers of visual collections feel uncomfortable with that notion. Even in a highly technical environment of space exploration, of which we tend to believe that terminology is fairly standardised the consistency of indexing varies (22). To give just another example, a photo of a street scene dating back 80 years may be used by historians, architects, cultural historians, sociologists. How could an indexer satisfy all these users when they will all have completely different needs: particular buildings, clothing, posture, trafic, etc. It seems that the only acceptable keyword then would be 'street scene' with an additional identifier stating the name of the street and/or the name of the town.

So it can be said that 'the attempt to reflect in subject indexing terms the pre-iconographic, iconographic and iconologic content of a given picture (...) implies a quite untenable exhaustivity of indexing (...) and no consensus view does emerge from the literature to guide the indexer in determining

an appropriate level of exhaustivity' (10). And that is the heart of the matter: there is no consensus and there cannot be a consensus as all institutes which document visual material serve different user groups with different needs.

Indexing is subjective, users often vary in background, knowledge, preferences, etc. As Busch puts forward correctly: 'the scientist, businessman, public administrator, or student may wish to obtain an quick, unambiguous, and correct answer to a question.' The historian however 'requires a different sort of response, reflecting a broader mode of inquiry' (7). The documentation centre which has to serve both categories then obviously has a problem. Furthermore, when indexing it is very difficult to differentiate between an image of Jerusalem and a picture symbolizing Jerusalem. The indexing language should allow such distinctions and the indexers should be prepared for it while users may not want it as it is a too subjective interpretation (26).

And then, detailed indexing is costly. On the other hand, if it is not done the burden of sorting through an entire database is shifted to the user again and again, which eventually will cost more (27). This statement seems to be correct except that it only applies to indexers and users within the same organisation.

In order to overcome these problems some even advocate a distinction between indexing for the layman and indexing for the professional, thus introducing a two-level approach (22). In itself this may well be a valid approach although one may have doubts when taking into account the effort and costs involved.

Another solution is formulated by Turner (27) when he stresses that in a non-art environment (and perhaps also in an art environment (?, JvdS) it is best to index images at the pre-iconographic (ofness) level and requiring the user to translate his iconographical questions into pre-iconographical terminology: Veracity should be represented by a lady holding a peach. Indexing in this way is streightforward more or less, and does not require much specialised knowledge. Both indexer and searcher benefit. But the painting by Magritte would thus be indexed with the keyword: pipe, although the title (but is it the title? What about: La trahison des images (the treason of images ?)) of the painting is that it is not a pipe! We are still left with doubts.

Concluding remarks

The obvious conclusion is that subject indexing is subjective, but that there are levels of subjectivity. When indexing an image at pre-iconographic level subjectivity may be low, but it tends to get higher as one approaches iconographical and iconological levels.

User groups vary widely, in particular in the user communities of general collections. They all have different needs, backgrounds, levels, etc. This therefore would call for full exhaustivity of indexing. We must however conclude that full exhaustivity in the majority of cases is not cost effective, although this is dependent on user and organisation type and there may be exceptions.

Is there a way out of this dilemma ? Unfortunately there is no panacae, only some recommendations.

In the majority of cases indexers should stick to 'plain and simple' indexing (which in many cases means: at pre-iconographic level), using index terms accepted by the users, and using preferably a thesaurus with many lead-in terms, thus placing the burden of further selection on the user. This is justifiable because of costs involved, but also because technology has produced the means for the user to browse through selected records in a user friendly way and have images displayed on the screen in tiles, thumbnails, or full size. The subjective interpretation is left to the user.

Some variants may exist, e.g. at the Netherlands Institute for Art History (RKD) we maintain a short keywords list of approx. 180 keywords with the aid of which all entered descriptions of works of art have to be indexed. Although the list is a mixture of pre-iconographic and iconographic level index terms, it bears a resemblance to the above mentioned type of list because the the terms are of general level (e.g. marines, landscape) and are widely accepted by the users. The benefit is that indexing is not time consuming. However, for certain parts of the collection Iconclass is used for more in-depth iconographic indexing, which of course is more time consuming and subjective. For selection purposes other elements are available, such as artist, dates, material, technique. These elements will be in most cases used to narrow search results.

As regards formal description it must be hoped that developments as listed in this article and others of which the author is not aware, will lead to an internationally accepted standard for the description of images. In this respect mention should be made of the Van Eyck project of which the RKD is one of the participants, during which a common core record description for an art object plus image will be defined (23). It is to be hoped that organisations such as the Getty AHIP, Visual Resources Association, ICOM/CIDOC, IFLA/Art Libraries, ARLIS and others will jointly pursue this goal.

An internationally accepted standard for the subject indexing of images is to my opinion not feasible, except perhaps on a very general level and should not be pursued with priority.

Last but not least, users should play an even more important role in the process of the definition or actualisation of an indexing system. They are the only ones to say if they are satisfied with the keyword 'Pipe' attached to Magritte's painting: Oh yes it is !, or: Oh no, it isn't !

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