William Vaughan

History of Art in the Digital Age: Problems and Possibilities

Abstract

This paper [1] aims to provide a broad overview on the impact of computers on the study of the history of art. It begins by considering the nature of the information technology revolution, exploring the often-made analogy between it and the 'Gutenberg' revolution brought about by the development of the printing press. Like Gutenberg, the IT development is technologically driven. However it is driven to a different end, one that emphasizes flexibility as well as dissemination. This flexibility can be a two edged sword. While it enables many new possibilities, it also seems to encourage a more fragmentary and iterative approach to study; to the preference of information over knowledge. It remains, however, something of an open question whether this new approach is a necessary consequence of the structure of the new technology being made available or whether it is more a product of that wider intellectual change that has grown with the emergence of Post-modernist discourses. I would argue that the latter is the case, and that the fragmentary tendencies that can be accommodated by the new technology can also be countered by those who wish to do so. The computer has developed in the way it has as a result of consumer demand. It is up to those who wish to make different demands to feed these into the technological processes as they are expanded and modified.
The paper also looks more specifically at issues that particularly affect the study of images, considering both the potential provided by the digital image for new forms of exploration and analysis, and the new opportunities that are emerging via the World Wide Web.

The IT Revoulution: Gutenberg revisited?

<1>
There can be little doubt in anyone's mind now that we are in the midst of one of the most dramatic technological transformations in the history of man. Since the establishment of the World Wide Web in the early 1990s, this revolution has affected - both positively and negatively - every society in the world. It has opened up a rich and exciting range of opportunities in the visual arts, as elsewhere - ones that seem to be infinite in their permutations. For many of us the World Wide Web and what it provides are still simply too good to be true. Hardly a day passes without me staring in wonder and disbelief with what I have just brought up on my screen, as I hear outside my window that now all too familiar sound; the beating wings of pigs as they fly by.

<2>
In times of dramatic change it is normal enough - after the initial shock - to try and stop and take stock of what is going on. Such surveys cannot, of course, be in any sense definitive, but they can perhaps help us to collect our thoughts and reach firmer decisions about what steps to take next. Having been involved in IT and the Arts in one way or another for more than twenty years I am probably better qualified now for looking backwards than forward. However, I hope that my current paper will end up by being more than a relation of what has happened. I have been involved in a number of projects myself, involving both visual and textual analysis, teaching initiatives and museum and archive projects. But it is not my intention to give an account here of these. Rather I wish to look more broadly at current practices, and to make some observations, as a user of the rich resources that are now on offer, of the effects that they are having on my own expertise - the study of the history of art.

<3>
Before going on to consider the ways in which IT is affecting the study, preservation and promotion of art - I would like to step back a little further to take in the nature of the IT revolution itself. In describing this, one previous upheaval is frequently invoked by commentators. This is the 'Gutenberg Revolution', the establishment in the fifteenth century of the printing press as a means for the mass reproduction of texts and images [2]. This technological advance enabled a new capacity in communication that proved critical for widespread material and intellectual change.

<4>
We can see well enough that the IT revolution has brought about an unprecedented access to an interpretation of information. But does this change go so far as to constitute a new mode of thought? Occurring as it has at a time of rapid intellectual change - the change summed up in cultural studies by the term 'post-modernism' - it seems to involve in its own nature that challenge to existing hierarchies that has been at the basis of revolutions in thought - such as that caused, for example, by the 'Copernican Revolution' of the sixteenth century when it was first definitively established that the earth revolved around the Sun. This view of the IT explosion as symptomatic of radical intellectual change is certainly supported by the French Cultural analyst, Jean-François Lyotard. In The Post-Modern Condition (1979) [3] Lyotard famously sees the IT revolution as an aspect of the change in 'narrative knowledge' that has emerged in the new technological age.

<5>
This challenge is certainly evident in changes in our perception of both history and of art. It was as long ago as 1979 that the French artist and philosopher Hervé Fischer proclaimed in a performance in the Pompidou centre in Paris that the history of art was dead. Fischer claimed that the 'linear' concept of historical progression was now over, a change that affected both our understanding of time and of activities like art that were dependent on it. Now, he claimed, art like history was dead and we were in the age of 'meta-art'.

<6>
The proclamation of the death of art has been a familiar avant-garde strategy since at least the early twentieth century. To link this with the death of history, however, was something novel, and reflects the doubts about linear progress that were soon to grow into a crescendo. Ultimately these seemed to be justified by the dramatic

political changes around 1990 that brought about the collapse of the communist bloc and the replacement of the dialectical interchange of the cold war with more mediated forms of discourse. The 'death of history' has now become a commonplace statement amongst cultural analysts, suggesting we are now in a world in which events no longer unfold in a monumental and predictable fashion, and in which none of the old values can be taken for granted.

<7>
We can see the impact of this in historical studies generally. 'Classic' studies, in which pride of place was given to 'objective' evidence and to 'leading' areas such as politics and economics, have ceded territory to all manner of investigation and to sometimes bewildering degrees of subjectivity. The history of art has been one of the many branches to be affected. The concept of history as a progression of styles orchestrated by Great Masters - has given way to a questioning of aesthetic canons and to the very notion of artistic development. It is significant from this point of view that the schools and departments that teach the subject in the U.K. are now increasingly changing their titles from 'History of Art' to 'Visual Culture' - a term that simultaneously obviates both history and art, replacing these with a temporally unspecific and aesthetically non-discriminatory exploration of the pictorial.

<8>
This change in academic practice is evident enough. But are we in fact dealing with a phenomenon that has any application beyond that rarefied world? Are we talking here of no more than an 'Ivory Tower' revolution? We are told that history is 'dead', a victim of the new perception of time as multi-layered and multi-dimensional. Yet events still seem to unfold in this 'post-historical' world in a sequential manner as they did before, and to be susceptible to very much the same kinds of description and analysis. We are told that art is 'dead' and that now all forms of visual manifestation should be of equal interest. But this doesn't seem to stop the public flocking to the old guardians of outmoded aesthetic values such as the Uffizi, the Louvre and the National Gallery. In fact they come in increasing numbers. Nor does visual culture's exposure of the myth of the 'masterpiece' seem to have put a dent in the auction houses' habit of selling these discredited items for countless millions.

<9>
It may turn out in time that the 'revolutions' in thought that we have experienced are less Copernican than they might at first seem. But perhaps we are simply too close to what is happening to understand it. What we can do, however, is to describe the visible symptoms of change, hoping thereby to build up in time a fuller picture of what is happening.
In the following sections of this talk I shall look at some of the symptoms that seem to me to be most telling, particularly in relation to the study of works of art.

Information and Knowledge

<10>
I will start with a general issue - that of the nature of the experience we gain via IT. I would argue that the new IT process foregrounds information over knowledge. The latter is a long-term process, conceptualized within the mind. Information is a form of short statement that can be delivered easily by automated processes. The gathering of information becomes much easier by these means. It remains an open question

about whether this change is actually driven by the new technical processes, or whether those processes are themselves a symptom of a deeper cultural transformation.

<11>
We are constantly being made aware of the increasing shortness of our attention span, and the ways in which this seems to be related to the diversions of a consumerist society. It would appear that we prefer, nowadays, the short reports offered in journals and newspapers to the long distance reading required by novels and scholarly investigations. Similarly the process of spending hours in the company of a single image is replaced by a practice that expects the stimulus of continual visual transformation. Reading of books on screen is becoming more common - but is still not easy for most of us. The ability of IT to fragment large works - for example the potential offered by DVD to subdivide film narratives into sections - offers a quite different way of approaching texts - both visual and aural. This could lead in time to them being reduced to a mass of information, explorable through all kinds of analytical processes but never appreciated, as they once were, as a totality.

Art and the digital Image

<12>
This practice of fragmentation extends to the digital image. The very process involved in its construction re-presents pictorial continuity as a series of distinct units, even when these are perceived by the spectator as an integrated whole. It should be remembered in this context that a digital image is not a 'reproduction' in the way that an analogue image is. Rather it is a transformation of an image, a translation from a continuum to a set of discreet units. When displayed on a screen the image is re-performed according to a set of encoded instructions.

<13>
The physical means of display encourages a fragmentary approach. The limited definition offered by most screens restricts quality encouraging this process of fragmentation in the way we look at them. The 'whole' reproduction of a work offered on the screen is usually a schematic mnemonic, put up as a guide for the spectator. It is only the individual details that can be provided in anything approaching their actual quality. Such processes can perform brilliantly for certain types of technical analysis - for example those required in conservation processes. But they do raise real questions when it comes to the issue of offering a surrogate for the experience of a traditional work of art.
As screen sizes increase, making possible larger and more detailed visual representations, it may be that this problem will diminish. Nevertheless, I suspect that the temptation to explore the fragment rather than absorb the whole will persist.

<14>
Quality and the Aura
Digital imagery opens up a new point of entry into the debate surrounding the issue of the 'Aura' of the unique work of art - that quality famously identified by Walter Benjamin in his essay "The Work of Art in the Age of Mechanical Reproduction" [4]. Much attention has been focussed on the notion that the 'aura' of a work of art is related to its 'uniqueness'. The digital image can present a challenge to such claims in two ways. First, it is by its very nature infinitely reproducible. Indeed it is nothing

but reproduction. There is, literally, no original of a digital image, since every version has equal status by virtue of being absolutely identical. Variation does occur in practice, but only at the point where the image is performed, as the performance is dependent upon the character of the apparatus displaying it. Even here, however, there is no sequential hierarchy. Each performance has an equal relationship to the code on which it is based.

<15>
The 'quality' of the performance is entirely dependent upon the apparatus used for display - just as the 'quality' of a piece of music performed is dependent upon the skill of the musicians performing it. The second challenge is also dependent on this performative nature. The digital image is not a 'passive' reproduction in the way that photographic copying is. It can therefore be used for interpretation, fragmentation and analysis as well as for reproduction. Yet there are questions about how much these implications can as yet be fully accepted. It seems significant that while contemporary artists incorporate the digital into their work, the production of pure digital art remains a minority activity. I suspect that it is the very lack of uniqueness that hampers development here, in an art world geared to reward individuality above all other criteria.

<16>
Opportunities
When looking at the opportunities offered, then one turns almost inevitably back to the question of information. How much easier is it now to access information! A single keyword typed in to a search engine like Google (but let's face it, there is actually NO search engine like google when it comes to quality of performance) can deliver a cornucopia within milliseconds. Yet we all know too that such information can be highly different in quality. Ironically it is the knowledgeable person who gains most here, since scholarly practice familiarized him or her with the process of sifting and critically evaluating large bodies of information. Even such seasoned explorers, however, give up thanks for the increasing number of sites compiling accurate well-researched material. In the visual arts there are textual indicators as there are for other historical studies - such as the Inventory of Artists Papers in the UK [5]. As yet there are far too few actual art texts available online - something that contrasts strongly with historical and literary studies. I have myself been involved in recent years in putting up Hogarth's Analysis of Beauty - which is viewable on the Birkbeck website [6]. I do hope that art historians will join in making more and more classic texts available online - particularly those that are not readily available these days in modern editions.

<17>
But the key area for the visual arts is of course the visual archive. Here we have seen great strides in recent years, both in collections making their images available online - such as the Tate Gallery in London which has a full text listing of their holdings and the vast majority of its images [7]. Equally impressive are those collections put together by consortia of museums, such as the American group Amico [8]. While the Tate site is free, Amico makes a charge - though one that seems to me to be a highly reasonable one. Yet this does lead to other benefits. While the quality of reproductions on the Tate is limited to that which is useful only as a screen display, Amico gives you images that can be useful for more thorough exploration. The quality of information provided, too, is far more scholarly than that given by the Tate,

which is aimed more at a general public.

<18>
There are also equally important virtual collections, such as that of the Corpus Vitrearum [9]. This aims to give a comprehensive and international inventory of stained glass windows (an art form, incidentally, uniquely well suited for screen display because of its transparency). While the information provided by the Tate is limited, this shows the highest scholarly standards. Such a work will surely in time render the printed catalogue raisonné obsolete - the more so since the online catalogue can be instantly updated.

<19>
All this is heartening. But there does, perhaps, remain one unsettling question in connection with such projects. This is the question of durability. In theory the digital image has an indefinite life. The code that creates it does not decay. However, such code is dependent for its survival and communicability on the electronic processes that store it and perform it. How reliable are such processes? An Egyptian hieroglyph, carved on a wall or even inscribed on a parchment scroll remains readable to this day, thousands of years after it was made. How long will a digital record last? When our civilization follows the course of all previous ones and meets its end (either by catastrophe or decay), how will it be possible for future beings to gain any kind of access to the information that we have been storing in our idiosyncratic and highly vulnerable machines? There may be an answer to this question, but it is unlikely that we will be around to find out what it is.

<20>
To the opportunities for documentation can be added those of new forms of presentation. 'Virtual' exhibitions mushroom. Some time these are surrogates for the real thing. One example is the National Museum of Uruguay, which exists as yet only as a website [10]. In this website we are given a virtual tour of the building that Uruguayans hope will one day be built. In the meantime they can still make us aware of the work of their leading artists via the website. The simulation of the museum visit on this site is perhaps important because it helps confirm a 'museum' status on the works that are looked at digitally. Elsewhere, however, the simulation of the museum visit can be dispensed with and other issues can be stressed.

<21>
A good example of a thematic virtual exhibition is the one mounted last year by the National Gallery London and sponsored by the BBC. This explored representations of the weather in art by means of showing images of pictures from collections throughout the British Isles. This might simply be seen as an exhibition on the cheap. But there was a further point being made. Not only did it engage the spectator in a particular theme. It was also a means of raising consciousness about the works of art on display in provincial museums that are all too little visited. Visitors to the site were made aware of the actual location of each work reproduced and encouraged to look at it there.

<22>
The increasing access to imagery provided by the web has also led to the growth of the teaching of history of art via the web. A splendid example of this has been provided by Britt Kroepelien in her account of the courses for History of Art that she

has developed at the University of Bergen for online teaching throughout Norway [11].

Problems, Ownership and Copyright

<23>
Kropelien's success in mounting her course can lead to envious eyes from colleagues in many countries. Her project received strong government funding, which enabled her to deal with one of the most enduring problems facing those in Britain wishing to teach using digital imagery. I refer, of course, to the problem of copyright. Perhaps this problem is now being overcome in most countries at the teaching level. Yet in Britain there is still no security offered, and the current copyright law is vicious in its implications. This means in practice that institutions have no affordable means of dealing with copyright and do not on the whole want to run the risk of infringing a law whose implications have as yet not properly been tested. The absurdity of the situation is that many private individuals make personal use of the huge wealth of imagery available to them via the web - or simply by the process of photographing or scanning reproductions, while not being able to use such material in a teaching situation.

<24>
Recently I tested this absurdity by deciding to take two routes to gain a reproduction of a famous Scottish Painting, the one of the Rev Walker Skating (familiarly known as the 'Skating Minister') by Raeburn. Knowing it was housed in the National Gallery of Scotland, I went to that institution's website. Only the tiniest of thumbnails of the picture was available, despite the fact that it has been adopted as an advertising logo by the institution as a whole. Knowing, too, that the National Gallery of Scotland was a member of SCRAN, the consortium of Scottish Museums [12] that make information available at a charge for teachers, I visited that site where, after searching through their database structure - a process that took some minutes, I finally came across the picture I wanted.

<25>
That was the 'correct' thing to do - but even that was only possible to me because my institution happened to have signed up to SCRAN and was paying the consortium an annual subscription. However while pursuing this virtuous path, I was all too aware of the temptation to fall into vice and use the alternative - namely an image search on the search engine Google. And in fact, an image search on Google, using only the keywords 'Raeburn skating' instantaneously provided me with examples of not just one, by over forty, reproductions of the skating vicar, many of which were equal in quality to the image being offered me via SCRAN. In view of such circumstances, it is no wonder that image bootlegging is the order of the day. But however satisfactory such illicit image usage is for the private individual, it still begs the question of when a fair system for the public use of images in teaching and research will come into being.

<26>
So far I have been looking at the acquisition of information via IT. But what about the possibilities of analysis and interpretation? This still remains one of the most disputed areas in IT. Even nowadays there are differing voices about the possibilities offered by artificial intelligence, expert systems and similar forms of analysis. In the visual

arts this issue focusses upon the problem of how far an image can be analyzed by computational means. We all know that there are specific forms that can be described and identified, and that such search possibilities have been widely used in scientific analysis, for example to identify different kinds of cells in clinical analyses which can be of great value in medical diagnoses or in the codification of the forms that will allow the automated processing of fingerprints or DNA samples. When we come to forms as complex as the visual image, however, it seems as though the complexity multiplies beyond the possible.

<27>
There are, it is true, some areas of design where specific formal characteristics can be identified. Computers have been used, for example, to identify certain types of furniture or spoons or drinking vessels. In all cases where the results have been effective there have been forms of sufficient rigidity and regularity to enable codified matching to take place. There are indeed forms within pictures that have such regularity. Face recognition - which has been used and which functions on the fact that the human face has sufficient regularity and predictability in its forms to enable identification - could be applied in pictures. Yet the problems of setting this up would be too complex probably to justify the returns.

<28>
Another approach is to take existing forms of image analysis and attempt to apply them to computers. As elsewhere this process is a testing one that leads often to the clear demonstration of differences of forms. Attempts have been made, for example, to codify the iconological system that was constructed by Panofsky for classifying the differing levels of meaning in an image. Yet as far as I know, this imaginative structure had proved too complex and elusive to ever lead to a systematic application. Panofsky's imaginative construct was, like so many structural systems created for the purposes of cultural analysis, more of a conceptual than actual model, and as such it is not really susceptible to mechanical application.

<29>
A different situation is the one presented by literal iconographical systems. The most notable success here has been the use of the codification system Iconclass [13]. Unlike Panofsky's iconological model, iconclass does not seek to organize layers of meaning. Rather it seeks more simply to assign a specific code for each element of meaning within a work. The directness of this approach - as well as the hierarchical order in which such elements are ranged - makes the assignment process achievable - although this has to be done via the input of specialists rather than by automated means. Nevertheless, the resultant outcome is a structure of information that can be entered into a database and that can lead to all the rewards that database structuring allows.

<30>
Iconclass classification systems are now regularly being used where collections of iconographically orientated imagery exist. Yet while straightforward in one sense, Iconclass and similar classification systems also throw up fascinating complexities. It should be stressed that Iconclass does not provide an unique identifier for a specific picture. What it does is classify a specific subject visible within a picture. The same picture can in fact bear an almost inexhaustible number of Iconclass code identifiers, depending on the interests of the classifier. To quote a specific example, Reynolds'

portrait of Kitty Fisher as Cleopatra could have one iconclass identifier as a portrait and another identifier as a representation of a subject from classical antiquity [14]. It could also be identified with reference to costume or jewellery. Subject and image have an independence of each other, something that would make little sense in terms of a Panofskian exploration of specific meaning. Yet nobody could deny the practical use of Iconclass as an encodable system of identification - albeit one that aids that fragmentation of knowledge into information that I mentioned earlier on.

<31>
It may also be possible to use a formal codification of pictures to analyze and relate compositional forms. As yet work in this area remains unproved, though the evidence provided by the practical application of processes that encode the structure of the image via digitization are encouraging. Recently the University of Northumbria have been applying IBM's QBIC system to the collection of the Guildhall in London, with encouraging results [15]. Earlier I myself was involved in a system used in connection with the Van Eyck project, a project that unfortunately has not reached fruition. Yet I feel enough was done there, too, to show how effective simple form matching can be [16]. The mistake - in my view - with those criticizing form analysis - has been to expect it to answer highly specific cultural related questions rather than to see it as the kind of visual equivalent of word searching. Once people have got over the fact that high cultural searching of image via the computer is unlikely it may be possible to make the kind of progress with simple form searching that has been achieved so spectacularly with word searching already.

The User's Share

<32>
This thought brings me to the final point that I wish to make about the computer. This is that it has only developed in the way that it has through the significant input of the user. The computer was invented by scientists and in its early days it looked as though it would remain the machine controlled by men in white coats, controlling all with their arcane knowledge. But this was never the vision of Turing, the British inventor of the computer. He always saw it as the 'universal transformation' engine. The transformations that it can achieve depend on what is asked of it. The whole history of IT has in fact been that of a tug of war between the scientist specialist and the amateur enthusiast. Or perhaps more importantly, between science and commerce. The original creators of computer systems were happy enough to speak to their machines in the highly complex machine code. It was business demand that turned it into the engine that could be manipulated by all in the office, and then in the home.

<33>
The internet was invented by a British physicist seeking a way of communicating more complex material to his colleagues world wide than that which could be sent by text emails [17]. Yet this new graphic environment rapidly moved from being a domain run by physicists to the universal communication system that it is today that has become absolutely central to all forms of commercial transaction. That was never the intention of its inventor. It was other pressures that caused this development. Those who make no demands of computer will receive no benefit. It is up to all of us to make demands, to press for what we think it will be possible for it to do. IT is far to important a resource to be left in the hands of experts.

<34>
But what this history has shown is that both enthusiast and expert are needed. What we have now is the product of their struggle, and more so, of the creative solutions that have come out of their engagement. Without 'consumer' demand, the Personal Computer (PC) would never have been developed - nor would the huge number of periphereral products that accompany it. The Web arose from the demands of a user group - a consortium of physicists who wished to send each other material using a graphics environment. It was its unsuspected commercial potential that then caused it to spread beyond that group.

<35>
The main message is flexibility. This, in the end, is the difference between Gutenberg and the IT revolution. Gutenberg brought in reproducibility - but it was inflexible reproducibility. The book, once printed, can't be changed. It can only be refuted. The website can be updated every second. And when it is updated the older version disappears - not like the book, which lies in libraries still proclaiming the same old message, irrespective of what has happened since. The book is the agent of those inflexible ideologies that have caused such misery in mankind. It is the servant of those smug, inflexible, predictive theories of history that hopefully have now come to an end. Nobody would predict with confidence nowadays what the situation will be like in even five years time from now. All that we know, is that things - both great and small - will be different. Art will be different, and so will its history.

Anmerkungen

1   This paper is a revised and considerably expanded version of a text published in the proceedings of the EVA Conference Electronic Imaging and the Visual Arts, 25 July, 2002, Imperial College, London; Conference Proceedings, 1.1-5.
2   The classic text that spearheaded the rethinking of Gutenberg was Marshall McLuhan's The Gutenberg Galaxy, (Toronto, 1962). It was McLuhan's contention that modern technology (which he at that time identified more in terms of television than the computer) was about to explode linear forms of thinking that had been established by the Gutenberg revolution. More recent voices have both identified the computer as the more potent agent of such change, as well as querying the ways in which this operates. See for example Umberto Eco's lecture From Internet to Gutenberg, November 12, 1996, http://www.italianacademy.columbia.edu/pdfs/lectures/eco_internet_gutenberg .pdf (02.05.2003).
3   Jean-François Lyotard: The Post Modern condition, Manchester 1979.
4   Walter Benjamin: The Work of Art in the Age of Mechanical Reproduction, translated by Harry Zohn, in: Eric Dayton (ed.): Art and Interpretation, Peterborough 1998.
5   Artists Papers Register, http://www.hmc.gov.uk/artists (02.05.2003).
6   http://www.bbk.ac.uk/hafvm/hogarth/index.html (02.05.2003).
      From working on the Hogarth project I have become all too aware of the huge labour involved in such enterprises. While we have the full text up now, we are still building the related notes and images.
7   The only images not included are those restricted by artists' copyrights.

8   The Art Museum Image Consortium.

9   Corpus vitrearum medii aevi. For the German website of the project see: http://www.cvma-freiburg.de/ (02.05.2003).

10   Museo Virtual de artes el pais.

11   See article by Britt Kroepelien in this collection.

12   Scottish Cultural Resources Access Network; http://www.scran.ac.uk (02.05.2003).

13   http://www.iconclass.nl/libertas (02.05.2003). The project is run from the University of Utrecht. Amongst other facilities there is an online index to classification provided.

14   Sir Joshua Reynolds, Kitty Fisher as Cleopatra, 1760, oil, Kenwood House, London. For a discussion of problems of classification see Catherine Gordon: Dealing with Variable Truth; The Witt Computer Index, in: Computers and History of Art Journal, Volume 2.1. (1992), 21-28.

15   Annette A. Ward / Margaret E. Graham / K. Jonathan Riley, Institute for Image Data Research, University of Northumbria at Newcastle, UK, Nic Sheen, Ibase, UK: Enhancing an Historical Digital Art Collection: Evaluation of Content-Based Image Retrieval on Collage; http://www.chart.ac.uk/chart2002-abstracts/ward.html (02.05.2003).

16   William Vaughan: The Automated Connoisseur: Image Analysis and Art History, in: Peter Denley and Deian Hopkins (ed.): History and Computing, Manchester 1985, 215-222.

17   Tim Berners-Lee: Weaving the Web, San Francisco 1999.