Software makes its mark: trademarks of the dawning computer era

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In this paper a time-line juxtaposing examples of trademarks and milestones in the development of computer graphics hardware and software is used to investigate two propositions about the relationship between our software tools and our visual culture. One proposition is that some capabilities that had not yet been realised in software tools were pre-empted by visual descriptions that, in retrospect, attest to the desire to realise those techniques that the software eventually made easily feasible and, in some cases automatic. This idea is similar to, and supportive of Geoffrey Batchen's assertion that the desire for photography in Western culture can be documented as preceding photography's invention.[1] The other proposition is that the capabilities offered by software tools have conditioned the architectonic form and therefore the stylistic outcome of the resultant artifacts.

The flashback tour of trademarks we are about to commence is of interest because it would be useful to be able to discern the extent to which techniques, in the form of traditionally evolved skills, are effectively maintained or transformed when those skills are virtualised in the form of software tools. Is there evidence of new practices to be seen arising from the non-material manipulation of digital technology? Are there totally new capabilities that may give rise to new expressions invented in the process of software tool development? Are there significant intended or unintended qualitative shifts resulting from digitisation of the technology and the virtualisation of traditional practices?

It is possible that this study may also contribute to our understanding of causality in regard to technology. Are the arguments of MacKenzie and Wajcman,[2] that the social is refashioned according to technological imperatives to be unequivocally accepted (and specifically, does this apply to work practice)? Do the demands, expectations and desires existing in culture drive the technological agenda (and specifically in this case the graphic professions)? Possibly there will be reflected in this survey an example of what Pickering described as a situation of socio/technological co-determination when referring to the implementation of automated equipment at General Electric during the late 1960s?[3]

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[1] Batchen, G., 1999, *Burning with Desire: the Conception of Photography*, The MIT Press, pp: 3 – 21.

[2] MacKenzie, D., & Wajcman, J., 1985, *The Social Shaping of Technology: How the Refrigerator Got Its Hum*, Open Univ Press

[3] Pickering, A., 1995, *The Mangle of Practice, Time agency and Science,* Uni of Chicago Press. Pickering is applying his analysis of the emergent resistances and accommodations to Noble's record of industrial automation at GE (Noble, D. F., 1984, *Forces of Production: a Social History of Industrial Automation*, Oxford University Press.

1950 - Turing Test proposed
- Floppy disk invented

1951 - UNIVAC-1, 1st multipurpose [number & text] electronic [magnetic tape] computer
- High level language compiler invented

1952 - EDVAC. - 1st video tape recorders
- Magnetic core memory developed

1953 - 10th [and last] Macey Conference
- 1st graphic system, SAGE, US Airforce [processed radar and other onfo]

1954 - FORTRAN development began

1955

1956

1957

1958 - LISP interpreted language begun
- Integrated circuit invented

1959 - 1st Xerox copier
- 2nd generation computers begin using transistors & printed circuits. They were smaller, used interpeters & accepted English commands

1960 - COBOL language, ALGOL language, APL language: all begun
- XGA [Extended Graphic Array], vector-refresh graphic display [large disc memory]

1961 - Man-Mac machine for drafting [2D]
- McLuhan "Understanding Media"

1962 - Ted Nelson coins the term, "hypertext"

1963 - IBM 360 compatible range of computers
- DEC PDP-8 1st Mini Computer $16,000

1964 - 3rd generation computers begin using integrated circuits [practical for business use]
- Computer mouse conceived

1965 - Bezier Curve invented
- 1st packet switching network

1966 - Intel founded
- ARPANET using NCP in US
- RFC network working group protocol

1967 - 1st commercial CAD system
- 1st RAM chip, the INTEL 1103

1968 - Unix operating system begun
- Intel's first single chip CPU 4004 microprocessor

1969 - PASCAL language finished

1970 - C object oriented programming
- 1st public demo of CAD/CAM concept
- 1st hand-held scientific calculator

1971 - 8800 processor released by Intel
- 4th generation computers begin [LSI &VLS]

1972 - Ethernet data & device sharing
- CLIP 4 [parallel architecture]

1973 - 8080, 8 bit processor from Intel
- 1st kitset micro computer, MITS Altair
- 1st implementation of BASIC language

1974 - Microsoft Inc founded
- IBM 5100 released
- Apple Computer Inc founded

1975

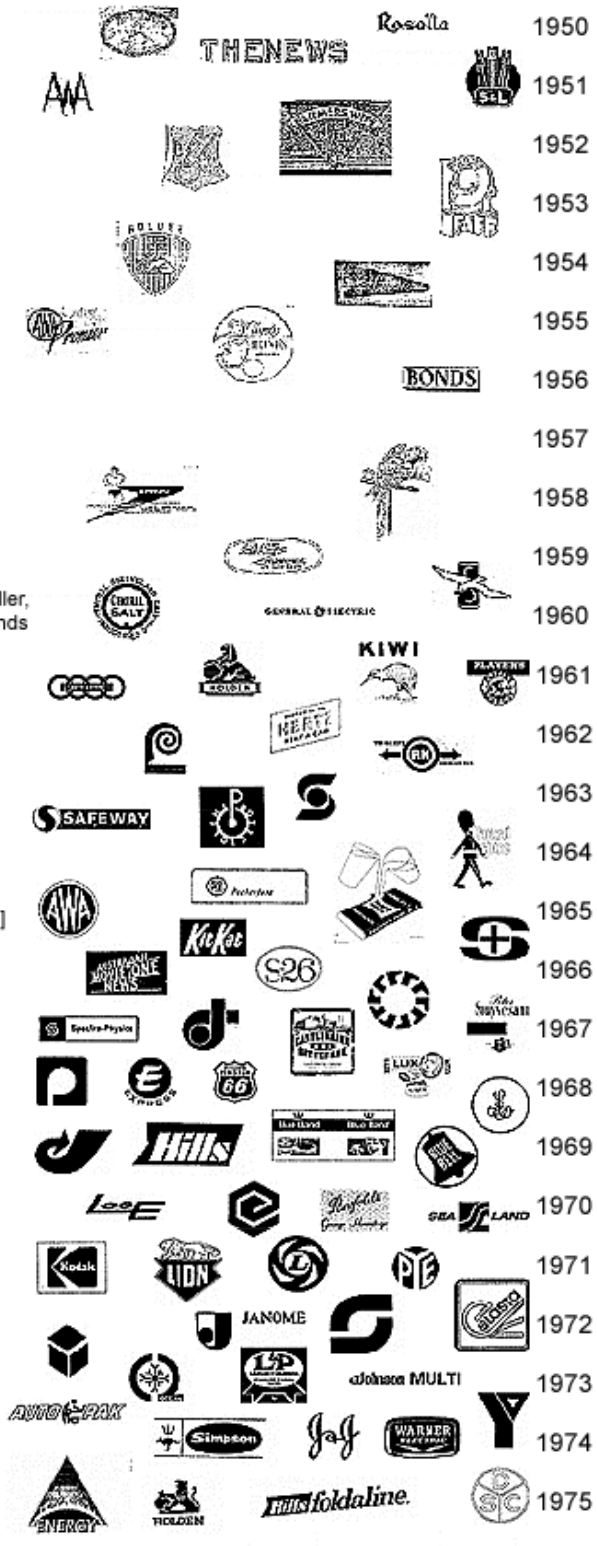

Figure 1, part 1. *Timeline of trademarks and milestones in the evolution of computer culture (continues over).*

1976 - Z80 & 6502, 8 bit micro processors
- 1st laser printer, IBM 3800, - CCD prototypes

1977 - Cray 1 [150mil.floating point operations/sec]
- Apple II PC released

1978 - "Space Invaders" video game released
- Hayes PC modem invented

1979 - 1st raster display terminal
- Compact disc [CD] invented

1970 - 68000 micro processor by Motorolla
- IGES standard
- Typical CAD system costs $125,000 US

1981 - Xerox 8010 system [for copier] 1st WIMP GUI
- IBM PC released [Microsoft OS]

1982 - MS DOS 1.0 - "Pacman" computer game
- Viscalc spreadsheet software for IBM PC

1983 - MIDI standard published
- TCP/IP ratified - *QikDraw* registerered in Aust.
- CCITT Group 3 protocol [facsimile]

1984 - Apple Lisa release - AutoCAD Vn. 1.2
- Apple Macintosh - CAD competes with 'trad.'

1985 - PostScript Level 1 [Apple laserwriter]
- Harraway, "The Cyborg Manifesto"
- Viatel public access videotext [Aust.]

1986 - CD ROM invented - EGA monitors
- Fractal image compression algorithm

1987 - Apple Mac II [colour] & SE release [SCSI]
- Adobe Illustrator commercial release

1988 - VGA colour
- Aldus Freehand release
- CAM common access method committee

1989 - WWW invented - MPEG-1 standard
- SVGA standard - SoundBlaster card

1990 - Adobe Photoshop Vn. 1 release
- Windows 3 release [WIN 1st launched 1985]
- MPC Level 1 & MPEG-2 specifications

1991 - Linux open system - Shaded 3D render
- Mosaic browser [with GUI] - Open GL

1992 - Internet traffic explodes by 300,000% [commercialisation of Internet connections]
- Intel Pentium

1993 - Adobe Acrobat release - MPC Level 2
- Netscape 1 release

1994 - PostScript Level 2 - Linux Vn. 1 release
- 3D graphics cards

1995 - JavaScript language release
- Win 95 - Microstation 95 Mac & PC
- Raytracing - MPEG-4 specified

1996 - "Quake" release
- Computer beats World Chess Champion

1997 - Pentium II
- Pentium 223 MMX
- 3D Studio Max 2 release

1998 - Digital cameras compete on quality and cost with film

1999 - Apple PowerMac G4 [1 bil. floating point operations/sec in a PC]
- Windows 2000 - MPEG-7 specified

2000 - AMD & Intel both release 1 GHz chips
- AOL/Time Warner merger [biggest in history]

2001 - Claude Shannon dies [had initited communication theory in 1948]

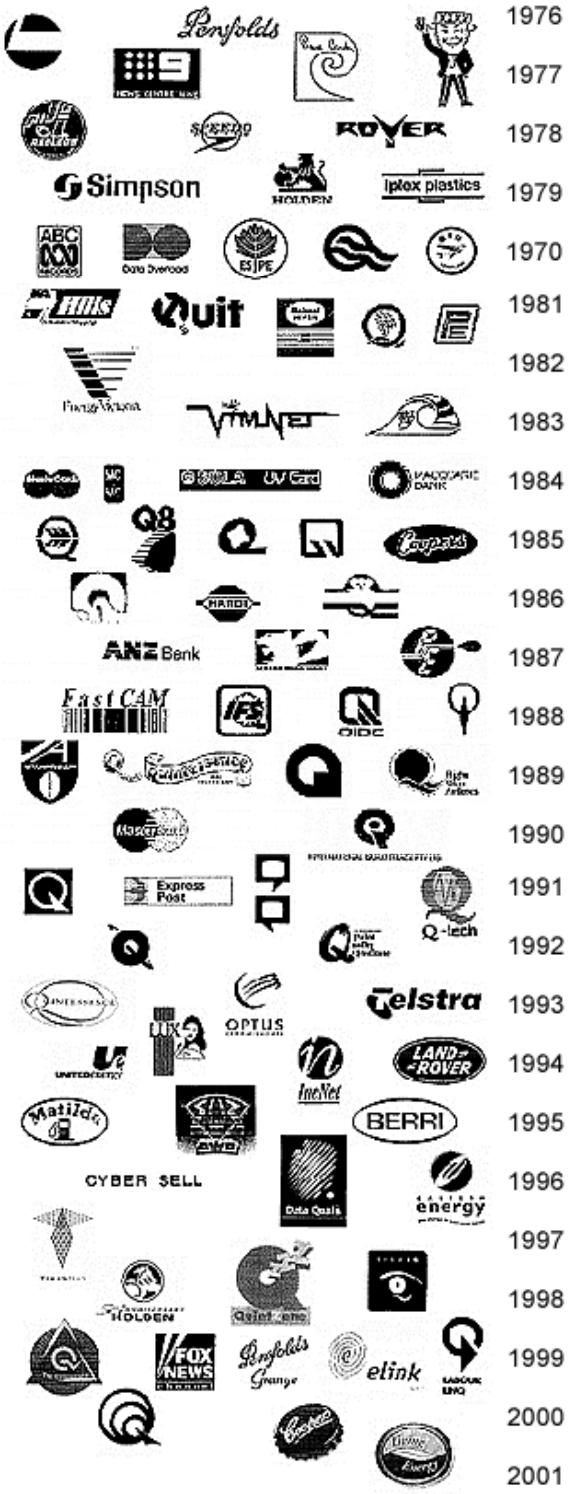

Figure 1, part 2. *Timeline of trademarks and milestones in the evolution of computer culture.*

(The source of all images entered into the timeline is The Australian Trade Mark On-line Search System, ATMOSS. All are property of the trademark owners and reproduced here without permission for the purpose of scholarly analysis.)

Because the sample period coincides with the fifty years during which computer graphic imaging evolved from concept to reality one may expect to see reflected, not only images that reveal cultural aspirations and desires related to the technological endeavour, but also graphical evidence of the impact of the effects of software and hardware on tool-users' creative practice.

Trademarks are appropriate graphical artifacts when looking for evidence of the emergence of ideas and practices in design culture. Trademarks are legally sanctified, representative agencies. There is a legislatively prescribed requirement that it be a unique and unambiguously individual statement in its class. The trademark as a logo, or *ideologue*, has as much to with advocating a particular ideology as it does with naming or pictographic representation. According to Althusser's post-Marxist view:

> *Ideology is a 'representation' of the imaginary relationship of individuals to their real conditions of existence.*[4]

A trademark virtualises the culture of an entity or the desirability of a commodity. Media saturation of branding is an attempt to make omnipresent this imaginary relationship to promote consumption of produce. A trademark exists as a product of discourse in a cultural environment. In this way fashions, popular notions and memes inform trademarks. Then, in turn, they themselves become part of such a cultural landscape. In this way a trademark can both subjectively reflect and objectively represent a concept or entity or movement with which it is contemporary. Indeed a trademark can become intensely involved in this culturalisation process that reaches from the roots of economic power to the most extreme perimeters of distribution and consumption.

Trademarks have always depended upon the hermeneutic and perceptual abilities of observers and the ability of visual symbols to communicate textually, abstractly and figuratively. The information carried is distilled to an entity, a single mark, unique like a finger print. All logos call variously on cultural moirés in symbolising the essence of a company or a brand in a market-oriented visual landscape. However, like the message of a photograph these can fade over time and shift in currency. For this reason longer-living trademarks are sometimes rejuvenated and revised. In any event the owners of a trademark must reapply for registration every ten years.

The semiotic quality of trademarks is so condensed that the function of textons and scriptons may be rudimentarily observed. Each entity communicates in one or both of two conditions: the textonic, whereby the information is perceived as code and read by the observer as language; and the scriptonic, whereby meaning is perhaps transferred representationally by resembling the form of some thing actual, remembered, or imaginable but, also perhaps abstractly, as pattern, movement, spatial arrangement. In the language of Paul Rand this is "[… d]istinguishing between the literal and the plastic meanings of images." By way of further clarification, it is worth citing Amedee Ozenfant:

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[4] Althusser, L. 'Ideology and the State' 1969, pp: 121- 173 in *Lenin and Philosophy and other essays*, Ben Brewster Tr. NLB 1971, p: 152.

> *Every form has its specific mode of expression (the language of the plastic) independent of its purely ideological significance (language of the sign).*[5]

Scriptonic qualities include those that the modernists knew as plastic, while textonic qualities relate to symbolic languages, which today include computer code.

It is highly unlikely that any computer-mediated image would have been commercially deployed as a graphic design before 1961. Dating from the mid-1950's, a system such as the US Airforce' SAGE (Semi Automatic Ground Environment) that had been classed as a graphic system was in effect a series of CTR displays that showed computer processed radar and other information. Computing was a very exclusive specialist activity during that early period. It required significant, joint state and corporate investment and research collaboration to progress the experimental projects.

Significant indicators of the period include initiation and continuing advances in the development of interpreted computer languages and, the development of magnetic core memory. But prior to the development of what are known as 'second generation' computers at the end of the fifties, computing was a domain concentrated in well-financed pockets of the automobile, aviation and defence industries, where long-term planning and development are norms of the manufacture process. Prior to 1959, and the advent of transistors and printed circuits, there was not yet the processing power, the display capacity to view vector graphics efficiently, nor the ability to print graphic forms, even though mathematical definitions of the points, vectors and lines of two-dimensional models existed. Development of algorithms with which to manipulate such data was well in progress.

Traditionally the tools of the graphic designer and the graphic artist were the pencil, the eraser, the marker, the sable brush, the roller-ruler, the ruling pen, the compass, the protractor, the French curve, tracing paper, the airbrush, the artistscope, the photo-set type galley, the scalpel, the burnisher and the mahlstick. Circles, arcs, repetitions, reflections, skews and spatial illusions using formal constructs readily achievable using those tools are common in trademark design of the 'fifties and 'sixties. Ellipses, that were hard to draft accurately and required the use of a custom measured jig, constructed of board or strings and drawing pins, are arguably less common in that period. More importantly, such shapes are quite distinctive in their form from later, computer-drawn counterparts. This observation is expanded below.

Even after television had been around long enough for Marshall McLuhan to theorise with some poetic license about the 'temperature' of that medium—and to offer his famous advice about messages and media—computers were unknown in the business world except where the productivity of their application justified their large cost. From the late 1950's the photocopier was probably the first electronic device to infiltrate the design studio and indeed, all manner of offices, along with the desktop calculator.

A shift from illustrative, figurative designs to formal geometrics and stylised abstraction is quite apparent in samples during the 1950s, commensurate with the momentum of Modernism. An auto-mechanistic, data processing semantic is

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[5] Ozenfant, A, *Foundations of Modern Art*, p: 249, as cited in Rand, P. (rev. edn.) 1970, *Thoughts on Design*, p: 18.

discernible in some of the logos adjacent to the decade 1960-70 of our timeline, even though it is highly unlikely that computers were directly involved in the creation and production of imagery.

Another genre began as soon as designers got their hands on the controls of graphic synthesis software and computer workstations suited to their objectives. Initially these opportunities were typically in defense industries, mass-product manufacture, metropolitan architecture, advertising for mass media and the movie and television entertainment industries. In the instance of the latter, John Whitney (Sr) had created the introduction to Alfred Hitchcock's *Vertigo* in 1961, using analogue computer devices, twenty years before digital devices such as the Quantel Paintbox became standard TV industry tools and ushered in a genre of spatially dynamic station promo and screen titling graphics. This phenomenon has been observed and described by Margaret Morse.[6]

Looking at trademark graphics, a tendency toward dynamism and 3D geometric illusion is apparent, beginning mid seventies and becoming more sophisticated into the eighties. Cartesian geometry and Renaissance perspective were ratified during the early CAD experiments. Technologists wielded the first wire frame teapots in cyberspace as they began to define the principles and algorithms upon which the primitives and shading capabilities, that are commonplace today, are based.

Whereas nowadays the computer code is integrated invisibly into the primary utility of affordable synthesis tools this was not always the case. The first commercial CAD system was shipped in 1968 and the first CAD-CAM demonstration was in 1971, but even as late as 1980, a typical CAD system cost $125,000 U.S. to kit out. However, as if by a kind of ideological osmosis, graphic themes investigating three-dimensional form spread through visual culture. This is an observable trend in our timeline from the mid-1960s to 1980. The inertia in the rate of change in technical practice was largely due to the need for cheaper, faster processors and cheaper RAM.

Perhaps the most significant catalytic event representing technological change in the graphic design and graphic reproduction fields can be pinpointed to a time after the release of the first personal computers, and after the invention of the Apple Macintosh. Its origin can be traced to the commercial release of the PostScript language in 1984.

After developing "Interpress" software for Xerox laser writers at the PARC research institute and, failing to convince Xerox of the potential of the product, John Warnock and Chuck Geschke went on to found a company called Adobe. Adobe developed a commercial, cross-platform, graphic description software language called *Post Script*.

Singularly, this software may have been the nemesis of an entire graphic reproduction industry—as it had evolved since the days of Caxton. Until that time, graphic designers had created specifications for typesetters, photoengravers, and compositors. The design firms usually ordered these services out-of house and passed the costs on to their customers. The reprographic films were dispatched to a printing company. Post Script made it possible to print graphic proofs in the studio using an Apple LaserWriter at 300 DPI and to send the same file to be 'ripped' and output to reprographic film, at 2400 DPI or more, by a Post Script licensed bureau.

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[6] Morse, M. in Morley, D. & Robins, K, eds. (1995) *Spaces of Identity: global media, electronic landscapes and cultural boundaries.* Routledge.

However the completeness of this revolution involved other elements. The creative techno-fervour of Silicon Valley in the late seventies and early eighties brought together Apple, Adobe and a third component, Aldus. The result was a complete computer-based text and image editing system tailored to the needs of the 'desktop publisher'. Adobe Pagemaker®, Aldus Freehand®, the Apple Macintosh® and the Apple Laser Writer® dominated these developments from around 1984.

The almost immediate effect was the conversion of traditional, manual and technical graphic skills to computer-mediated synthesis using software tools. Graphic design practitioners were introduced to new interface metaphors: the folder, the drop-down menu, and the bomb. The designer was the first professional to use the haptic mouse to click, to double click and to drag and, to have a trashcan icon at his/her cursor-tip. Such professionals were guinea pigs of a vertically integrated business model based on computer mediation. They quickly found themselves on a treadmill of software versions, system and hardware updates.

Users of IBM PCs and 'clones' were yet to experience the benefits of the *Windows* interface at that time. There were hundreds of thousands of business users, but each needed significant code-language training to gain proficiency using the cryptic, complex and limited range of word processing and number crunching programs available for the open architecture machines. Thus, the desktop publishing revolution took place to its largest degree, on the Apple Macintosh operating system where an intuitive, graphical-user-interface (GUI) provided a metaphorical, objectified desktop whereby the user manipulated the virtual mechanics of a software tool.

The new business model succeeded in motivating graphic designers to take up the challenge to become computer literate in a number of ways. Firstly, there was the notion that with the appropriate hardware and software anyone could become a visual communicator. Many design firms large and small, felt the need to stay ahead of their clients and so committed to the expenditure and the learning curve with little hesitation. Secondly, the PostScript language capability built into the Apple specific desktop publishing suite enabled design houses to save large outgoings for typesetting and proofing costs. The ability to take on the tasks of the reprographic compositor was provided by the software in the form of controls for ink trapping, to overprint and knock out inks and to specify vignettes, gradients, screens and textures. It demanded considerable responsibility of the computer operator (who was often the designer on a steep learning curve). More than likely, this person was coaxing a Mac through long and often frustrating hours—watching the hands on the little clock icon while the computer processor, straining to multitask, either coped, or didn't cope with the work load—learning the hard way about 'PS ERROR's, font conflicts and the myriad of teething troubles that came with connecting hardware, software, device and human elements. However, a firm could save significant, specialist reprographic labour costs. Thirdly, designers gained confidence to experiment and make decisions on screen—using the WYSIWYG (what you see is what you get) capability of the Apple system which included dedicated screen technology to represent, at first, scales of grey, and then two years later in 1986, colours with acceptable correlation to the anticipated physical output. Powerful new drawing tools were also available to them. The most significant of these was the ability to draw complex lines using Bezier curves.

Evidence of the infection of trademark designs with Bezier curves is a significant indicator of the influence of software on the formal qualities of design. Curves that display less architectonic and less curvature range quality give the impression of having been drafted freely by hand. Such comparative formal qualities of hand drawn

lines and Bezier curves are described by Dmitry Kirsanov[7]. The increasing prevalence of Bezier curves in corporate icons is a discernible trend in figure 1 from the mid-1980s. Also evident is the increased use of the oval form and gradient fills. These are distinctive qualities that stem from the capabilities of DTP software using vector-based algorithms to describe shape objects. Examples of such software programs include Freehand®, Illustrator® and Corel Draw®.

The examples of ovals from the pre-computer era in the sample show a greater variety of formal constructions than those examples from the mid-1980s. From that time onward it is more difficult to find uniquely curved and subtly asymmetric forms typical of the hand-drafted ellipse. The mathematically-generated, geometrical symmetry of the ellipse algorithm, as typically commanded by the application of the ellipse tool when using common graphic illustration software, is consistently, and almost exclusively evident ranging from that period on the timeline.

Continuing along the fifty-year timeline, another milestone significant to this study is the release of the first commercial release of PhotoShop® image editing software by Adobe in 1990. This software added controls for synthesis, distortion, effects, transformation and modification of bitmapped images to the toolbox of the desktop publisher, visual designer and compositor, and drove another nail into the coffin of the *traditional* reprographic compositing house.

Very shortly after this time, events that summarily comprise the commercialisation of the Internet became catalyst for a further global revolution in computer mediated communication. At the time of writing, this technology promises to relieve traditional print media of the lion's-share of communicative responsibility and forebodes a new kind of television. The craft of creating content for these new screenic media requires new skills. Designs for these *new media* are unavoidably conditioned by the technology that defines the media and by the capabilities of software tools. The defining mode is digital. And more and more, increasingly, the digital experience is shared in distributed networked environments.

At the close of the period of study we see examples of trademarks where form is rendered so as to appear dimensionally dynamic. A full, photographic, tonal and colour range is technically more readily achieved using the digital toolbox without additional reprographic screening expenses. Image and text synthesis tools are commonplace and so too are compound images in the logos.
There is evidence too of a tendency toward a new kind of amateurism. This shows itself as the registration of marks wherein the figures have too much information to be satisfactorily graphically reproduced at small scale. In other words, the designer has failed to take account of the limits of the scalability of detail when using the standard reprographic dot screens. A professional graphic artist will usually ensure both visual and technical coherence in the downscaling and up scaling of a mark.

Also apparent is an increased move to present the illusion of three-dimensional artifacts in the figures. That the metaphors and trompe l'oeils typical of 'net graphics

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[7] URL: http://www.webreference.com/dlab/9902/architectonics.html (as visited 15 April 2001).

have quickly become part of a broader visual vocabulary is witnessed too. Such is the speed with which fashions, themes and genres infect culture.

Analytical review of some specific examples in detail

Some specific examples of characteristics that have been observed above are next reviewed in detail.

1 / Tracing the ellipse

It is quite difficult and time-consuming to draw an ellipse by hand. Techniques for achieving one vary. Sometimes a jig with string and drawing pins to guide the line may be used. Sometimes a variety of templates known as 'French curves' may be used to form sections of the outline. Hand-drawn ellipses tend to be less regular shapes with more complexity of curvature than computer-drawn ellipses. The latter tend to be more regular. See for example *Figure 2*. Whilst also showing obvious defects such as the masked section of curve at the base, this Holden logo from 1948 illustrates what I believe to be the classic architectonic irregularities of the hand-drawn ellipse, shown here with ellipses made using the ellipse tool in Photoshop drawn over in red. This is not to say that an irregular ellipse is not achievable using a Bezier tool—it is—but it requires more than a simple dragging out of the shape using the ellipse tool. An oval of complex curvature may be achieved using digital drawing tools either by dragging out and adjusting the specific curves using a Bezier pen, or by modifying of the length and angles of the anchor point handles on an ellipse made with an ellipse tool.

Figure 2. *Holden Logo, 1948.*

Figure 3. *Telstra Logo, 1993.*

By contrast, the Telstra logo at *Figure 3* makes use of a simple ellipse typical of having been dragged out using a standard ellipse Bezier tool (see matching overlaid ellipse in red). The ellipse has subsequently been rotated. The intersecting stroke of the initial capital 'T' would have been readily achieved using layers.

Depicted in the top row at *Figure 4* are details of the only 3 examples of elliptical logos to be found in the samples from dates prior to the invention of *PostScript* (and affordable graphic software and hardware capability). Trademarks based on ellipses or using them, as major elements of construction became more common after that invention and veritably flourished from around 1992 onwards. This is not to say that hand-drawing of ellipses and forms based on them ceased after 1984.

Figure 4. *Ellipses before and after PostScript.*

2 / 3D illusions and forms

Representation of the third dimension on a pictorial plane is a technique perfected during the Renaissance. When desire for such illusion is evoked in the design of a trademark it is invariably supportive of ideology positioning the product or service in the market place. For example, with reference to items in *Figure 5*: the Pfaff logo (1954) uses the 3D typography to imply monolithic strength; the Optus logo (1993) uses the 3D illusion to imply spatiality and global communication, whilst also defining the letter "O"; the Cooper's logo (2000) uses photoreal view to make its beer cap appear familiar, and possibly in some billboard applications larger than life. However as was shown to be the case regarding the manner in which ellipses were constructed prior to and after the emergence of practical and affordable graphic software tools, I believe that the impact of computer graphics is evident in samples presented at *Figure 5*. In this case all of the examples are representing 3D forms. All but three of them, the first two and the last in the series may be considered abstractions. In the following discussion of the examples in *Figure 5* and *Figure 6* I will refer to each by the date attribution beneath it.

Figure 5. *3D representation in trademarks.*

Example '1954' shows an oblique view of type with thickness receding into depth and '1966' makes similar use of perspective, but without the thickness, to make the typography appear to loom out of pictorial depth. The latter connotes a movie billboard. I consider that both examples draw on visual interpretation arising out of the traditions of pictorial realism.

Examples '1969' and '1974' are similar in that the formal spatial element is based on the visual conceit of an isometric view of a cube. Subtle curvature at the corners of the upper face of the cube in '1969' adds an anamorphic ambiguity that enables less strictly geometric interpretation of the overall shape. The more complex '1974' involves an implied cutaway view that reveals lines that define the facets of the cube. The Escher-like implausibility of these gives prominence to the denotation of a lower case letter 'e'.

Example ‘1980’ employs an oblique view of a wavy planar form. These three examples make use of a visual language associated with mechanical drawing to define forms that are either clearly or ambiguously 3D structures.

All of the examples discussed in the previous two paragraphs were created without the aid of computer drawing tools. I contend that designers of trademark examples ‘1969’, ‘1974’ and ‘1980’ and others with similar characteristics in *Figure 1* may have been influenced by an anticipation of the imminent emergence of CAD-CAM technology that arose in popular culture resulting from technical literature, news and television coverage about those techno-scientific developments that occurred 1960 – 1980. The first commercial CAD system was demonstrated in 1968. By 1980 typical CAD systems cost US$125,000 and so even at that time were not commonly available to graphic designers.

The final four trademarks presented in the sequence at *Figure 5* beginning with ‘1993’ quite clearly were produced after the time when computer graphic software tools had become ubiquitous. They exhibit distinctive characteristics that I argue are attributable to capability of the software and would not have been so readily produced otherwise.

The graphic component of example ‘1994’ consists of a crescent and three parallel arc shapes which are intersected in a manner that defines a white filled circle in the centre of the composition. This is an example of a visually complex form constructed using a drawing program. The designer has utilised Bezier shape tools to create discrete objects, the ability to easily move and transform those objects and the capability to use layers to mask objects *below* in the ‘stack’ using objects *above*.

The ability to algorithmically transform discrete graphic objects is apparent in the graphic form of example ‘1996’ where the letter ‘e’ has been perspectively flattened and rotated to create a plane defining the lower hemispherical shape without which the whole would appear as a simple circle. In addition the softening of the upper hemisphere connotative of atmosphere or firmament was most likely achieved using software capability to create a radial graduated halftone tint. This would have been a more complex photo-reprographic process requiring expertise not commonly available in-house in a design firm prior to the availability of programs such as Photoshop.

Because of the use of transparent qualities to enable the enhanced definition of spatiality, example ‘1997’ is very interesting. It looks as though it was conceived, if not finally produced, using the capability of a 3D-modelling program. The perspective rendition of the vertical and horizontal grid planes that comprise the letter ‘T’ could have been drawn, rotated and sheared using drawing or photo editing software. But it looks to have derived its existence from experimentation with 3D drawing software. If one accepts this suggestion, then it is perhaps pertinent to compare this work with those earlier examples claimed above to have anticipated the arrival of CAD. I suggest that once there is capability to manipulate discrete 3D shapes with virtual actuality the complexity of the possible preoccupations differ multifariously from those that were preconceived to be the case.

The last icon to be considered in the range selected for scrutiny as 3D representations is example '2000'. An earlier (1984) logo for the same brand was discussed in relation to ellipses. This one is different in that it involves photo-realistic reproduction of a bottle cap. This is significant from two different points of view: first, technically. In times before the ready availability of photo editing software the use of a photo-based logo would have involved such technical complexity, due to the difficulty of providing reproducible half-tones at the variety of scales that may have been required for different purposes, that it would have been considered impractical. Greater computer disc capacity and photo-editing software enable the storage of a high-resolution master that may readily be scaled for output and screened to a suitably reproducible dot pitch for printing. Secondly, there is a sense that this type of pictorial is significant in terms of visual culture. It can be considered hyperreal.

3 / Pictorial Representation

There are notable differences in styles of pictorial representation throughout the period of study. Whilst these are reflective of cultural change and of genre it is clear that they also arise from change in technical capability. Example '1959' in *Figure 6* is a line drawing version of a parrot that in the '50s was already a well-known commercial art icon from colour lithographic biscuit tin labels that comprise a distinctive genre of now collectible commercial art. Such art calls on the illustrative traditions of natural history paintings and lithographs. This version is prepared to be suitable for newspaper reproduction of the time. The graphic line work is open and has no tonal values that would require half tone reproduction. The realism of this icon can be contrasted with the stylised graphics of example '1987' which utilises strongly contrasting areas of solid black and white to create a dynamic interplay of positive and negative shape to define the lion head and the helmeted driver.

Whereas '1959' is obviously drawn with pen and ink, '1987' is more likely to have been drawn using a Bezier pen tool to make use of the reprographic advantages that the vector graphic format provides, especially in regard to scalability of the output. The architectonics of the curves of the forms in '1987' is consistent with those produced using the Bezier pen tool. This logo conforms to a well-defined genre too—that of the racing decal. Its defining characteristic is its stylisation.

Figure 6. *Pictorialism, simulation, stylisation and simulacrum*

Examples ‘1974’ and ‘2001’ have been given the form of a badge. The former uses an illustrative mode to render the form of the flat bevelled edge using readily reproducible line work—as per ‘1959’, this was a common form of commercial art prior to computer graphics. It could have been produced using a scraperboard (a white surfaced board coated with a black wax film that when scratched with a burin produced crisp reverse line work). In captioning this trademark I have used terminology coined by Baudrillard and called it a *simulation*. This enables me to contrast its graphic modality with that of ‘2001’ which demonstrates all the characteristics of a Baudrillardian *simulacrum.*

Example ‘2001’ is a graphic composite that uses continuous tone rendering technique to simulate a badge with all of the presence of photographic reality including reflective highlights and a shadow. In essence it is using a photo-rendering technique to refer to a fictional object as if it were real. The overall shape is that of an ellipse consistent with those described above as typically made using a Bezier ellipse tool. The bevel that frames the central image is similar to those that may be created algorithmically using filters in ‘2nd wave’ graphics tools such as After Effects (the target market for which is special effects artists) and, Kai’s Power Tools and Macromedia Fireworks (that have capability specifically aimed at web graphic artists). The overall finish is reminiscent of the reflective, glass-like buttons made popular through implementation in the Mac interface and which quickly became a common style for many web site navigational buttons in the late 1990s.

It is interesting then to consider that here we have an example of a graphic deployed as a trademark, where the dominant medium of communication has historically been first print and then additionally television, which shows evidence of being strongly influenced by a specifically computer-graphic style. It is interesting but perhaps not surprising when one considers what is generally accepted as the prevailing contemporary techno-cultural condition known as media convergence.

Today’s techno-scientific mediums including the digital computer, particularly in networked modality, facilitate the emergence of new techniques of production, having also virtualised the old, and so contribute to the increasingly indiscrete fluidity of the modes of visual representation.

Interpretation and review of arguments

With too precursory a glance, the timeline at *Figure 1* may be seen as providing support for a McLuhanesque, ‘soft’, technological determinism whereby technology itself is a driving force for change. The sociological consequences of accepting such proofs without cross-examination are dire. As Pierre Lévy advises,

> [… w]*e must be careful* […] *to distinguish causal or determining actions from those that prepare the way for or make something possible. Technologies don’t determine. They lay the groundwork. They expose us to a broad array of new possibilities, only a small number of which will be selected or employed by social actors.*[8]

[8] Lévy, P. *Becoming Virtual, Reality in the Digital Age*, Plennum, 1998, p: 128.

Obviously, the history of the development and use of computers can't be reduced to a few historical milestones. This story is more appropriately understood as a complex and seamless web of interests and agencies. However, by focusing attention on the development of tools for the production of visual artifacts and a sample of those artifacts that have been institutionalised as brand marks, we are observing an affect that Michael E. Doherty describes whereby "any technological artifact . . . can be seen as both a tool—something functional or working in the world; and as a realm—a reconceptualized worldview with the theory/technology foregrounded."[9]

Some of the significant affects of the application of technology are not necessarily envisioned when the technology was designed. The rate of the feeding-back or the interaction time between product development, its utility, and the demand for improvement becomes almost instantaneous in the wired, digital world. For example, late in the period of study, in anticipation of the dynamic tension of demand for software with which to create content conforming to the specifications of HTML and DHTML is resulting in major extensions to the capabilities of software originally marketed as tools of graphic reproduction. Examples are: the capability to migrate between CMYK and RGB colour modes; tools that compress and optimise the file size as opposed to maintaining high resolution fidelity. And there are hosts of new-comer software tools—for digital video and audio editing, for making animated-gifs, and tools that facilitate the design and synthesis of interactive content by incorporating behaviour libraries of readymade scripts for common interactive multimedia events.

In this paper the inter-relationship between technological development, technique and ideology has been highlighted. We have seen how ellipses derived from Bezier curves became common after the tools made this possible. We have also seen that one outcome of such a trend can be the development of new extrapolations, which anticipate and amplify sociocultural preoccupations.

We have also seen how CAD-CAM and 3D capability was foreshadowed in graphical representations antecedent to the software development that would enable ready construction of the forms depicted in those images. In other words, as Batchen has put it, we witnessed emergence of ideas as desires—ideas that arise in culture and flourish like a contagion; as Dawkinsian memes. We have then observed how, once the enabling technology arrived, the preoccupations of practitioners were actually quite different from what was pre-imagined.

We have seen that software tools like material tools leave their marks. There have been quirks and characteristics introduced to visual language, particularly as witnessed in the architectonics and grammars of image representations. The deployment of new software tools introduces simultaneously possibilities and limitations for practitioners.

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[9] Doherty, M. E., 1995, "Tools for the Realm", *CMC Magazine*, September 1, p: 4.