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THINKING SOFTWARE IMAGING

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“..I am sick of the thinking behind such software...”

Tools affect visual and physical outcomes. The ideas of inventors and the work of engineers who know the limitations of materials and processes have been central to the development of creative possibilities in the arts, science and commerce of post-Western culture. Photography has been at the very centre of this enterprise. A tool in its own right, it has in addition recorded the impact on the wider culture of each and every tool invented.

A history of the development of computer software will find it difficult to distinguish the contributing factors of each discipline. It is the epitome of post-modern industrialisation, merging borders between ranges of expertise, hybridising occupations and professions, de-centralising production processes into a matrix of workstations and networks scattered across the globe.

The course of the development of image manipulation development software has been guided for the most part, by one determining factor - the international market-place and the mobility of capital. The short response to the anguished cry at the head of this article is that there is not a lot of “thinking behind such software”, since it is the helter skelter of venture capital and the scramble for market share that determines what it is the tool will achieve.

In the late 80s and early 90s there were several products vying for a share of the emerging imaging market and in particular the rapidly expanding desktop publishing market - after all, cut and paste was a term which had come originally from the publishing industries - products like ColorStudio, ColorTouch, Photo Styler, Picture Publisher and Photoshop. The first commercial release of Photoshop in 1990 (on a single 800k disc), rapidly overtook the opposition packages as the licensed distributors, Adobe, introduced the product to the non-specialist as well as the specialist markets.

All the digital imaging products at this stage took the same approach to software engineering based around the principle of pixel-editing whereby changes made to the values recorded in the digital file of the image were irrevocable,¹ (except for the one-step backwards Undo

command and the option to revert to the file in the state it was upon being opened). Unfortunately this was to become the basis for further development. The code was cut, the die was cast - upgrades kept the revenue flowing to the corporations, new features and improvements often simply took advantage of real improvements in hardware and system software development. Ten years later, Photoshop is now owned rather than just distributed by Adobe and through shrewd marketing, not least a pricing structure that introduces the product to a consumer group in their student training phase, it has become the industry standard.

Vector-based software is quite different from pixel-editing. *"...a vector image is described by a mathematical curve rather than with pixels. When the image is drawn on the computer screen, the vector shape is filled and you have perfect image quality"*.ⁱⁱ Illustration software (for instance, Illustrator and Freehand), is based on this principle. For image manipulation software to function in this way would require a sea-change approach. The development of a vector-based imaging program thus arose as a possibility in the mid to late 1980s from software engineers' responding to the Quantel Paintboxⁱⁱⁱ. Paintbox was heavily reliant on pure and very expensive computer power. A French software engineer Bruno Delean reckoned it should be possible to substitute the expensive hardware with much cheaper software. He began work on a project to develop an application to be called Live Picture®.

The software he developed was extremely complex in order to achieve a vector-based imaging program and considerable mathematical and coding innovation was required. The genesis was in true cottage-industry style, the basis of experimentation and trialing, much simply on paper, and together with the initial code, was put together far away from California, in France. The team of five engineers^{iv} who came together in 1993 had *"more than 15 years combined experience of designing high-end graphics palettes....its root deep into pre-press and high-end graphics."*^v

The core of Live Picture® is the FITS file, an interchangeable imaging database and rip^{vi} engine. *"It contains all the image data in a way that allows the rip engine to provide a mathematical expression of each color in a point. Instead of storing all the pixels of the photo montage, it stores the mathematical expressions of the effect. What we claim to be resolution independent, is actually effect independent, based on the color of the image.... We calculate one formula for each pixel seen on the screen"*.^{vii} The FITS file works in conjunction with another proprietary file format called IVUE. From a standard image in TIFF or Photoshop format, pixel-based data is effectively changed into mathematical equations and saved as an IVUE file, the design of which permits fast image access and viewing.

This abbreviated description of these principles indicate why working with Live Picture® enables the photographer and the artist to work with little interruption to a visual thinking process during the compilation of an image. In the words of a Paris-based artist, Grant Symon, *“Live Picture ... is a great creative tool which encourages a working methodology which is impossible in Photoshop and which consequently, produces a very different type of image. I use Photoshop for two things - firstly for the ‘rubber stamp’ cloning tool, which is unbeatable for spotting images, and secondly I use it as a ‘color enlarger’ because when coupled with a high-end RGB printer it is unbeatable. However, when it comes to creative work and letting my imagination flow, Live Picture is the only game in town”*^{xiii}

Why then is not a tool like Live Picture® in active competition with the market dominant Photoshop®? The short answer, in the words of a Photoshop historian, is that it *“has since died.”*^{ix}

Though the gestation period for Live Picture was parallel with that of Photoshop and other pixel-editing programs its release did not occur until 1993, at about the time Adobe were distributing the Mac and Windows 2.5 version of Photoshop. This was due to the extraordinary machinations of finance and marketing arrangements that the Live Picture development team encountered including the sudden migration of venture capital to the development of software tools specifically for the Web during 1995. The appearance of its final version (2.6.2) was in 1997.

But resurrection is a feature of the software industries as much of the music industry, with multifarious takeovers and the mergers of their various properties. During 1999 the Canadian company, MGI, *“purchased the assets of a small software firm called Live Picture Inc for \$8.5 million.”*^x The assets were the resolution independent FITS/IVUE file format, now being utilised to enhance the images on websites with the ability of the user to zoom in without the pictures breaking-up. At the end of the year, the previous owners *“MetaCreations released its product engineers and put their products on the auction block”*.^{xi} And then in March of this year, Doug Erickson announces on the Live Picture listserv^{xii} *“We are building a new genre of photo activity technology & content for the Web. I can't tell you much more, but the idea was sparked by the numerous Internet photo communities and photo activities. I can't even tell you about the people involved, but I will hint that they are the core people behind LP. We are currently building a prototype of the core technology (proof of concept) which will be the indicator for continued pursuit, a commercial version, the development of the User Interface (UI), etc.This seems to be the way of most technology startups. I am reading The New New Thing, about Jim Clark. According to Clark, most startups are engineer driven. Engineers bring the marketing, sales, and UI folks in after the prototype is functional.”*^{xiii}

So, if “most startups are engineer driven”, how do engineers actually go about their task? I suggest, first, the engineer has to have a model, a concept of what task the tool needs to be able to achieve. Second, identify the weak link in the paradigm, (or current tool), which can then be re-worked to produce greater speed, flexibility, economy whatever, and deliver a replacement tool. ^{xiv}

Bruno Delean identified the weak link in the Quantel Paintbrush, (dependency on expensive hardware), and innovated the solution. The questions about what it was Paintbrush actually achieved was probably not asked except by the Live Picture UI designer, Tony Redhead^{xv} whose job it was to make sense for the user of the ragbag of features that had taken the engineers attention. As one of them observed about the sorting process: “*We usually face a ‘huge’ list of requested features and have only a limited amount of resources - time and engineers. We have to reorganise things in buckets and pick the ones we’ll work on. This picking process is marketing oriented, (user oriented), but the sorting is technically oriented. This explains why some “easy” things get left out - they fell in the wrong bucket - while others less important end up being implemented.*”^{xvi}

Where did the marketing/user orientated data come from?

Robert Blumberg was one of the co-founding backers of Bruno Delean’s proposals in 1993. Their estimate in 1996 when they conducted an analysis was, “... *that Photoshop had about 500,000 core users. Whereas Live Picture sold maybe 50,000. That seems like a horrible failure on the surface. But with some analysis it may look a bit different. We estimated that there were roughly 35,000 “image smiths” in the U.S. These are people who manipulate images on a full-time basis mainly in the commercial advertising food chain. This doesn’t include pre-press types that do layout, graphics and then just do some color changes. Live Picture was really for the “image smith market” because its specialties were: (a) manipulation of large images and, (b) creative manipulation. Nobody purchased Live Picture for mundane imaging (crop, rotate, color correct); that was the domain of Photoshop. So, by 1996 just about the entire market either had purchased Live Picture or didn’t want it because they were hooked on PhotoShop. That’s when we lowered the price, hoping to appeal to a wider market - the image smith “wanna be’s. So there just wasn’t enough potential money to justify the large R&D team required to keep the product competitive with PhotoShop.*”^{xvii}.

Pixel-editing software undoubtedly enables a large number of people to keep the publishers of print, media and web supplied with the millions of images that assail us each day. But does this make it the best tool for artists to work with? Indeed for any user is not the overall tendency to restrain and limit innovation, even adaptation itself? Is it sufficient that Adobe licence third-party developers to enable access to a defined range of filters and effects? The

range of tools that photographers have had access to and invented for one hundred and sixty years has been massive and has been in part responsible for the vast variations of response and resulting images. Innovation and adaptation of tools by photographers and artists is part of their core practice, a component of the task of describing paradigms whether they be physical or conceptual in result. For the digital darkroom to be defined by one corporation challenges the diversity of solutions that other toolmakers can offer.

The conclusion is one forecast by artists at the outset of the adoption of the computer as a useful tool 30 years ago - who is going to write our software? Significantly those artists advanced in the computer arts have learnt to program using programming tools that do not require a degree in computer science, (C++, Java, X-Script, Lingo), in a way similar to earlier times when an artist might have chosen to learn Italian or French in order to advance their art. Others have actually achieved advanced level skills in both the arts and sciences - could this indicate that a second age of *homo universalis* may be nigh? Or is the life span of a computer language too short for anyone but the full-time software engineer to invest time in mastering?

The Golden Nica of the Ars Electronica 99 for .net art was awarded not to an artist but, by invitation, to Linus Torvalds, who described himself as 'a leader of the first generation' of Linux operating system software engineers. The prize recognised not only the significance of the software in making networking and Web operations less arcane but also that the code itself had been produced within an 'open source community' with large numbers of people of various skill levels working collectively on projects employing the source code over the Internet.

"The art of programming is in the design stage," Torvalds suggested, *"a lot of people sharing code for a long time who all fed back responses,"^{xviii}* was the advice offered for the development of software for any conceivable purpose. A blooming of image manipulation software across the internet is the next stage we could begin to build.

ⁱ See more discussion of these characteristics of pixel-editing in Walkling, Les, 'The Desensitisation of Photography', pp.....

ⁱⁱ Delean, Bruno, in Photo Electronic Imaging Vol 37 No 4 1994, interview with Elmo Sapwater.

ⁱⁱⁱ Quantel Paintbox was the first succesful digital image manipulation tool based on very expensive standard industrial computers for which very expensive proprietary software had been written to each specific customers requirement. They could only be afforded by big television stations and graphic design corporations.

^{iv} Bruno Delean, Adolfo Vide, Laurent Albert, Laurent Saboret and Philippe Bossut.

^v Bossut, Philippe, email correspondence with author, 1.3.2000

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- ^{vi} RIP - Raster Image Processing, whereby the value of a pixel is mathematically calculated according to formulas specific to each manipulation ?
- ^{vii} Delean, Bruno, in Photo Electronic Imaging Vol 37 No4 1994. (Philippe Bossut alleges in email correspondence with the author (1.3.2000) that parts of this source is not to be trusted. "Much of it is a staged story, based on real facts but highly edited by Rob Blumberg [co-founder] to provide an entertaining 'story' for the papers".)
- ^{viii} Symon, Grant, email correspondence with author, 29.2.2000
- ^{ix} Schewe, Jeff, '10 Years of Photoshop', Photo Electronic Imaging, Feb 2000
- ^x Chidley, Joe, 'Picture Me Rich' in Canadian Business, March 2000
- ^{xi} Schewe, Jeff, '10 Years of Photoshop', Photo Electronic Imaging, Feb 2000
- ^{xii} www.mail.idnet.net.uk/lpgroup/
- ^{xiii} Erickson, Doug, Sales Director for Live Picture in the mid-90s, email correspondence with author, 15.3.2000
- ^{xiv} This will not only repay the venture capital investors but sell so well as to give them access to better and greater working environments that will enable engineers to go on to improve more tools.
- ^{xv} Redhead, Tony, now Sydney-based, runs a Web production company but according to an email (1.3.2000) from Philippe Bossut: "Kai Krause ... did the initial LP 1.5 user interface (UI) layout. Then, Kai and Bruno got mad at each other (a clash of egos, I remember the day in Toulouse in November 1993), and Tony Redhead jumped in and pulled the whole UI story together. Tony was thrilled by the image composition capacity of the product and he's responsible for putting so much emphasis on it in the UI. He worked extremely closely with us - the 5 engineers - Tony was a Quantel Paintbox power user so it's no wonder LP has a sort of kin relationship with this high end machine, to the dismay of PhotoShop users...". Tony Redhead has been unavailable to contribute to this article.
- ^{xvi} Bossut Philippe, email correspondence with author, 6.3.2000
- ^{xvii} Blumberg, Robert, email correspondence with author, 6.3.2000
- ^{xviii} Torvalds, Linus, during a satellite hook-up at the ORF Landesstudio, Linz, Austria.