Canonical Software

written by Jeremy Huggett | 21/03/2015

Lists are all the rage – and not just the traditional rundowns at New Year. In 2014 Paul Ford suggested that it might be possible to propose a software canon consisting of great works of deeply influential software that changed the nature of what followed. He suggested five: the office suite Microsoft Office, the image editor Photoshop, the videogame Pac-Man, the operating system Unix, and the text editor Emacs.

Earlier, in 2013, Matthew Kirschenbaum had come up with ten: like Ford, he listed Photoshop but there was no room for Microsoft Office (instead WordStar and VisiCalc) – and no Pac-Man (Maze War, Adventure, and Minecraft were the games in his list). There was no operating system, but he did include Mosaic, the first graphical web browser.

Engaging in this kind of debate is generally best done over a few drinks, but in their absence, what would be the software canon for archaeologists?

I offer the following suggestions (admittedly with a somewhat UK-centric focus):

1. **Netscape** – Kirschenbaum selected Mosaic as the first graphical web browser and the precursor of Netscape, Internet Explorer, Firefox, Opera, Safari etc.. However, when Mosaic appeared, the nascent Web was largely unknown beyond universities, and it was the success of Netscape that expanded awareness and access to the Web even if it led to Netscape's downfall at the hands of Internet Explorer. In the process, Netscape laid the foundations for what has become the primary means of access to archaeological information online (along with access to just about everything else).
2. **ArcView** – the introduction of GIS in archaeology has been transformative through its ability to manage spatial data alongside textual, imagery, and other datasets. Ken Kvamme is often credited with its introduction in archaeology; in Europe, Trevor Harris described one of the earliest applications in 1986 and Milco Wansleeben described a home-made GIS constructed using dBase III and various BASIC and Pascal routines interfacing to a mapping program in 1988 (and see Powlesland, below). But it was really the availability and flexibility of ArcInfo/ArcView in the 1990s that saw archaeological GIS take off. ESRI's software rapidly became an industry standard, although through subsequent versions of ArcGIS it never lost its rather buggy reputation. Free open source GIS is rapidly becoming a real competitor, but software such as QGIS wouldn't exist were it not for the success – and the cost – of ArcGIS.
3. **dBase** – Ashton Tate's dBase may not have been a true relational database, but its interactivity and programmability made it extremely flexible and accessible at a time when SQL was still the reserve of large mainframes. The availability of compilers such as Clipper and QuickSilver meant that programs could be distributed without the need to purchase the expensive dBase package.
4. **AutoCAD** – although software such as PlanData by Brian Alvey and Jonathan Moffett

graphically recorded single context site plans, it was access to AutoCAD with its AutoLisp programming language that made customised archaeological site planning functionality possible. This could range from simple automated functions such as developed at Deansway to more elaborate systems such as Brian Alvey's HindSite, the successor to PlanData, which used AutoCAD to create quasi-three-dimensional models from two-dimensional context plans using their stratigraphic relationships to provide the third dimension.

5. **Tomb Raider** – both Ford and Kirschenbaum cite games, so here's a history of Tomb Raider from 1996 to the present day to take you down memory lane, although in terms of sheer variety, the Indiana Jones series perhaps shades it …

Of course, there has also been influential bespoke archaeological software. Noble mentions could perhaps include:

1. **Aerial** – a bespoke aerial photograph transcription package by John Haigh. Initially written in 1980 in BASIC on an RML 380Z, rewritten in FORTRAN and finally in C++ to release a Windows version in 1995 (Aerial 5), it may not have been the most user-friendly of software in its various iterations, but it provided a powerful set of tools to rectify and transcribe aerial photographs – and later versions allowed the incorporation of DEMs for more accurate rectification taking account of the ground surface.
2. **IADB** – the Integrated Archaeological Database, initially developed by Steve Stead and Pete Clark and taken on by Mike Rains since 1989, it was the first really integrated excavation data recording system for post-excavation analysis, developing into a full-blown virtual research environment via the VERA project at Silchester in the mid 2000s. It's the predecessor (and still competitor) of site data management packages such as L-P Archaeology's ARK**.**
3. **Dominic Powlesland** – developer of bespoke archaeological site software since 1984 and probably created the earliest hand-held onsite recording system (using the Sharp PC1500 with a one-line 26-character display and 8 kilobytes of memory, moving across the years through a range of hardware variants including Handspring PDAs in 2000). He also developed his own GIS in the mid-1990s, G-Sys, which enabled 3-D plotting of data and the integration of survey data, digital imagery, and vector data.

Not that influential necessarily means good. Who can forget the nightmare that was **Superfile** by Southdata? This was a flat-file database system introduced in the mid-1980s by English Heritage to enhance the management of Sites and Monuments Records (SMRs). It ran on a range of different systems (CP/M, DOS, Xenix etc.) and offered variable length records, both of which were seen as key advantages. However, it was far from reliable – its indexes often had to be rebuilt to recover 'lost' data, and, amongst many other things, it was frequently unable to retrieve data accurately. For instance, a search for *sites with Roman coins* would find a match with a site such as a *Roman road with a Medieval coin* … Not surprisingly, those SMRs who could, stuck with dBase or similar, or else used facilities on their local council mainframe, which created a mish-mash of different systems and presented major challenges for data exchange. It wasn't until 1998 that exeGesIS was launched, which is now widely used for Historic Environment Records/SMRs…

What would digital archaeology be like had these packages, and others like them, not existed or not been adopted? How much has changed in the intervening years? And, of course, what has been

forgotten?