

# DIGITAL INNOVATION IN ARCHAEOLOGY

Archaeological data and practice are becoming increasingly digital, stimulating the manufacture of software and hardware solutions for in-field data collection. Digital data are becoming central to most archaeological projects. Indeed, many projects are now aiming to become exclusively paperless. In the light of this development, numerous web-based software solutions have become available to facilitate the collection of digital data in the field, some bespoke, others 'off the peg' and in use elsewhere.

The purpose of the traditional recording system is to provide a coherent, consistent, and structured methodology for documenting archaeological remains discovered through the process of excavation (including evaluations and watching briefs).

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Information technology has made steady advances into the archaeological field over the last two decades and in some cases has displaced or works in tandem with more traditional paper-based systems. Survey, graphics, and most publication-related tasks are carried out digitally and the desire is to bring fieldwork practices into line to create a more streamlined process.

Manual paper-based forms create additional project costs; weeks are often spent typing out and digitising paper records and scanning drawings to then digitalise them into a file that can be manipulated on a computer and in AutoCAD. Data input onto Excel spreadsheets is archaic and time consuming. It can take 15–30 days to convert the data from all forms into a digital format. Photos must be managed manually from a digital camera by the user, increasing the chances of human error. Backing up the data is not an ideal method and paper-based systems are inherently volatile and unstable by their very nature. The system in its current format is just not practical and with well over 20 form types, multiple folders and records, sketches and drawings, the whole process can be somewhat unwieldy.

These issues can be bypassed by putting the on-site information straight into a digital format that can be used immediately by project managers in the field, or by clients in their own offices. If all the records are in one location that can be accessed at any time, then the site can be visualised and assessed in real time without having to wait for the paper record to be digitised.



*Site surveying in a rural setting. Credit: Wardell Armstrong*

Ideally the system would use a GIS map-based or map-linked interface, so that records, photographs and drawings are georeferenced and can be seen on a map of the site and viewed and amended in GIS. The archaeological world is moving more towards using GIS as a way of ensuring the usability of data through all stages of the planning process and it is important that we modernise and enable our systems to have the capabilities to do the same. HS2 and East West Rail are setting standards for GIS deliverable data and are paving the way for archaeological companies to follow suit.

One of the trickiest requirements is to replace the need for Permatrace. Archaeologists need to be able to recreate on a tablet what they do on a paper drawing. Instead of drawing a plan or section on paper, scanning that sketch to turn it into an image file and tracing that image file to turn it into a vector file that you can manipulate on screen, the aim is to just draw something on the screen that is digitalised immediately. Architects create precision drawings in an immediate digital fashion, so the possibility is already there.

However, there are several issues with digital recording that may limit or slow down the overall uptake of a purely digital-based system.

Corrupted data is a real possibility and is potentially non-retrievable, making sites a total write-off. In the same way, human error could be catastrophic, so training is vital. However, training costs and time can be very expensive, and as technology changes this will have to be ongoing. It's also important that staff who find it harder to use new tech aren't left behind and marginalised, so any new systems and hardware should be adaptable and user friendly.

Craig Huddart, Technical Director of Archaeology, Wardell Armstrong LLP



*Traditional manual site recording.  
Credit: Wardell Armstrong*



*Completely paper-free digital recording in action.  
Credit: Wardell Armstrong*

The cost of hardware, software and data storage can be extremely expensive and the initial costs may be prohibitive. New equipment and new software will run into tens of thousands of pounds and there's also the issue of ongoing maintenance costs. However, these costs will be offset by time saved on site and in person hours of data entry in the office during post-excavation.

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Potentially the main issue regarding digital recording is the loss, or perceived loss, of traditional skills. These skills form the backbone of the profession and standards should be maintained. Should there be a technology failure, it is imperative that traditional skills can be relied upon. Ongoing training should be in place and newly graduated archaeologists should be taught both digital and traditional methods.

The purpose of this article is to provide food for thought and I hope that it opens a debate within our profession. Other industries are forging ahead with technological innovation and it's vital that we attempt to stay within touching distance of them. We work hand in hand with many industries and we need to remain relevant, professional and innovative, with information and data being transferred digitally.

**Craig Huddart**

Craig is Technical Director of Archaeology for Wardell Armstrong LLP and lives in Teesdale, County Durham. From February 2021 he will be appointed as Head of Business – UK at Red River Archaeology Group. Craig has previously written for *The Archaeologist*, authoring a piece on the importance of mental health provision within archaeology.

Craig has been in archaeology for over 15 years and has worked on, supervised, consulted on and managed every type of site from watching briefs through to large-scale infrastructure and renewables schemes. Craig is responsible for large-scale, high-value project delivery and business development. Craig still enjoys the day-to-day management of complex archaeological sites and his major archaeological interests lie in the period spanning late Roman through to early medieval Britain.

