Revolutionizing Archaeology: The Transformative Power of Digital Technologies

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Abstract

Digital technologies have transformed the field of archaeology, from the way sites are discovered and excavated to the way artifacts are analyzed and interpreted. With the advent of digital tools, archaeologists have been able to streamline their workflow, save time, and increase accuracy in their findings. As a whole, these projects trace one history of digital technology's impact on the organization of archaeological labor, from intensifying work due to increased efficiency, to increasing the pressure due to newly available data sources, and to reorganizing the in-field procedures that at once takes advantage of efficiencies and frees up labor at the trench edge.

Keywords: Transformative, Archaeology, Digital Technologies.

Introduction

One of the most significant changes brought about by digital technologies is the way archaeological sites are discovered. In the past, archaeologists would use traditional methods such as digging, probing, and surveying to locate sites. However, with the introduction of satellite imagery and aerial drones, archaeologists can now identify potential sites without having to physically visit the location. This has

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saved a lot of time and resources, and has also enabled the discovery of sites that may have been overlooked in the past.

Another way digital technologies have transformed the field of archaeology is through the use of 3D modeling. Traditionally, archaeologists would create sketches and drawings of artifacts and structures found during excavations. However, with the use of 3D modeling software, it is now possible to create highly detailed and accurate digital models of artifacts and structures. This has allowed archaeologists to better understand the structures they uncover, and has enabled them to share their findings with a wider audience. Any such history should also include discussions of the military and industrial models that have been used to organize human labor in archaeology and to manage that labor for greater efficiency. Most recently, archaeologists have been adopting digital technologies eagerly, but the implications of this trend for the discipline are only beginning to be understood. In this paper, I wish to explore these latter two elements — the organization of archaeological labor and the emergence of digital tools — in the context of three archaeological projects that I have been involved with as either a director, co-director, or assistant director, all of which have relied upon digital technologies to achieve their results.

Digital technologies have also revolutionized the analysis of artifacts. In the past, archaeologists would examine artifacts using traditional methods such as magnifying glasses and microscopes. However, with the introduction of advanced imaging technologies such as X-ray fluorescence and computed tomography, it is now possible to analyze artifacts in much greater detail. This has allowed archaeologists to better understand the materials and manufacturing techniques used to create the artifacts.

One of the most exciting applications of digital technologies in archaeology is the use of virtual reality. By creating digital reconstructions of ancient sites and structures, archaeologists can now immerse themselves in the past and gain a better understanding of how people lived and interacted. This has enabled archaeologists to communicate their findings to the public in a more engaging and accessible way.

The Tharros Archaeological Research Project

One example of an archaeological project attempting to adjust the way it deploys its human resources in the face of a new, disruptive technology is the Tharros Archaeological Research Project (TARP), directed by Steven Ellis at the University of Cincinnati. I serve as the assistant director for TARP and am specifically responsible for the geospatial and 3D modeling techniques used in our digital recording systems. The broadest goal of TARP is to develop a clearer understanding of the city's urban development, which has until now been either only vaguely understood or, where is more confidently

attested, often built upon outdated or incomplete bodies of data. Through a more critical and evidence-based delineation of urban development, particularly one that can be anchored to chronological markers recovered via excavation, our project seeks to connect the city's periodic urban expansions to broader aspects of Mediterranean history.

Despite all the benefits of digital technologies in archaeology, there are also some challenges. One of the biggest challenges is the cost of the equipment and software needed to use these technologies. Additionally, there is a learning curve involved in using these tools, and many archaeologists may not have the necessary training or expertise to use them effectively.

Conclusions

In conclusion, digital technologies have transformed the field of archaeology, from the way sites are discovered and excavated to the way artifacts are analyzed and interpreted. While there are still challenges to overcome, the benefits of using digital tools in archaeology are clear. As technology continues to advance, it is likely that digital tools will become even more essential to the field of archaeology.

Even when seen only through one person's experience of three interrelated projects, the impact of digital technologies on the organization of archaeological labor is clearly profound and multifarious. Indeed, if we examine only one aspect of that impact, the increased efficiency of fieldwork, one may fairly describe efficiency as beneficial and deleterious. The specific case studies in this paper, however, have focused more upon a few novel approaches that the additional time gained from such efficiency might be redirected to, such as the study of the Quadriporticus' colonnade or its archival materials. At the same time, the Tharros Archaeological Research Project shows how the deep investment in digital technologies can disrupt traditional workflows and lead to either significant inefficiencies or to new opportunities. Thus, TARP is reorganizing the labor idled by our new 3D recording process for interpretive tasks rather than for additional excavation in another trench.

Finally, these three projects all show that not only are digital technologies, such as databases and photogrammetry software, replacing analog recording materials and procedures, but also that these new technologies are increasingly becoming the intermediating frameworks between us and our objects of study. Similar to the question of efficiency, and bound up with it, this issue of digital workspaces is both a concern and a necessity. Although categorically no different than paper context sheets, the data entry form on a tablet presents a highly structured and thus significantly limited means of interaction with archaeological materials. The carefully organized blank fields allow for easy capture of relevant

information, but equally easily imply that if evidence cannot be described in this form, then it is not relevant.

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