Digital Public Archaeology at Must Farm: A Critical Assessment of Social Media Use for Archaeological Engagement

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The excavation uncovers the 'wood mass' of well-preserved debris and contents from the pile-dwellings. Image: Cambridge Archaeological Unit

Digital public archaeology is increasingly exploring social networks as platforms for online outreach initiatives. Despite a growing body of literature concerning archaeological engagement on social media, there are few examinations of such applications in practice. This research critically assesses the current discussions surrounding archaeological social media use before exploring commercial digital outreach at Must Farm, Cambridgeshire. Quantitative examinations of the project's Facebook metrics and qualitative comment analyses are employed to assess whether audiences were meaningfully engaged by these online strategies. The research concludes there is substantial value in using social networks to communicate archaeology and provides recommendations for future applications.

1. Introduction

Social networks have been identified as powerful tools for empowering users and offering enhanced communication between archaeological projects and audiences (Bonacchi 2012; Bonacchi and Moshenska 2015; Richardson 2013; Walker 2014a; 2014b). The use of social networking sites for communication and dissemination by archaeologists is far from a new phenomenon, with examples dating back over a decade (Hunt *et al.* 2008; Richardson 2007). However, the role of digital engagement within public archaeology is still unclear. Few case studies have been published evaluating the application and impact of digital outreach strategies from development-led projects.

This article focuses on the online outreach work of the Must Farm project, an archaeological excavation on the outskirts of Whittlesey, Cambridgeshire, between 2015 and 2016. The excavation was selected as it is a rare example of a development-led project embracing digital technologies to disseminate information and communicate with audiences.

This article explores the use of the project's Facebook page during the excavation, from October 2015 to August 2016. It examines the quantitative data generated by Facebook's inbuilt *Insights* tool to analyse key metrics and audience response. Qualitative content analysis is then applied to user comments to characterise the forms of interaction taking place.

Concerns about the uncritical acceptance of digital metrics as evidence of engagement are discussed alongside the composition of online audiences. The article concludes that social media can deliver meaningful engagement to audiences in development-led contexts. However, successful implementation requires a considered strategy, collegial support and a willingness to nurture dialogues with users.

2. The Must Farm Project

Between June 2015 and August 2016, the Cambridge Archaeological Unit (CAU) undertook excavations at the Must Farm quarry at Whittlesey, revealing well-preserved Late Bronze Age archaeology (Knight *et al.* 2017). The project was funded jointly by the landowner Forterra, a supplier of building materials, and Historic England (2016). Excavation uncovered the remains of several pile-built houses, enclosed by a timber palisade, constructed over a small river (Knight *et al.* 2017).

The settlement underwent an extensive conflagration event that resulted in the deposition of substantial amounts of both structural and cultural material into the palaeochannel below (Knight *et al.* 2018). The combination of both charring and waterlogging created highly favourable preservation conditions for organic materials (Figure 1) and the site produced notable quantities of textiles, wooden artefacts and environmental evidence (Knight *et al.* 2018).

Figure 1: The excavation uncovers the 'wood mass' of well-preserved debris and contents from the pile-dwellings. Image: Cambridge Archaeological Unit

Prior public engagement work at Must Farm had employed traditional outreach activities consisting of limited site tours, talks to local societies and occasional media coverage (Alberge 2011; Waugh 2011). Before new work began exploring the pile-dwellings, a comprehensive project design was created, including recommendations for an outreach component (Knight *et al*. 2015). It was specified that there should be a 'cumulative community outreach/involvement programme designed to reach as broad and diverse an audience as possible' (Knight *et al*. 2015, 51-52). Alongside previously implemented outreach activities, digital technologies, including social media, would be employed to help deliver more widespread engagement (Historic England 2015).

Two part-time outreach officers for Must Farm were appointed. Selina Davenport carried out physical activities (tours, talks, visits) and Christopher Wakefield created, distributed and maintained digital content. Owing to the site's situation within a working quarry and the location of the excavation area, public access to the site was limited. Some 2500 visitors were shown Must Farm during the project. However, the overwhelming demand for tours meant that many people had to be turned away. This restriction on physical access made the project especially keen on delivering a detailed and varied digital output.

When not conducting outreach work, both officers were senior field archaeologists involved in the excavation. This ensured their knowledge and interpretations of the site were current and detailed. The digital outreach officer worked approximately 16 hours per week on creating and maintaining online content and the remaining 21.5 hours on-site excavating. The precise division of time spent on different digital tasks (writing posts and blogs, taking photographs, responding to comments and private messages, scheduling material and moderation) varied considerably from week-to-week. Therefore, it is not possible to provide a detailed breakdown of the different digital tasks. Digital outreach centred primarily on three platforms: a dedicated website, a Twitter account (@MustFarm) and a Facebook page. Prior to the commencement of the regular digital outreach a dedicated Facebook page was created as no CAU social media accounts existed. Similarly, pre-existing channels related to the project, such as Historic England's and the University of Cambridge's social media accounts, were inaccessible to the outreach officer.

All three platforms regularly shared content, predominantly photographs with contextual descriptions alongside more detailed 'Site Diary' blog posts. Online material, including images, descriptions and blog posts, was created solely by the digital outreach officer. Similarly, comments, questions and direct messages on social media were all answered and managed by the same individual throughout the excavation. Occasionally site record and publication photographs, 3D models, plans, illustrations and schematic graphics were shared with the consent of the CAU's respective specialists: Dave Webb (photography), Donald Horne (survey) and Vicki Herring (graphics).

2.1 Social media selection and content

Facebook formed a key component of Must Farm's digital outreach and the analysis of interaction on this social media platform acts as the foundation for this research. This decision was made owing to the lack of analysis of Facebook within heritage and archaeology (though see Fernandes 2018; Gruber 2017; Huvila 2013; Kelpšiene 2019 and Spiliopoulou *et al.* 2014) and as it proved to be the most popular social network used by the project. Despite this focus it is important to emphasise that Facebook was one element of a wider, coordinated engagement strategy that was both physical and digital in nature.

Figure 2: The Must Farm Archaeology Facebook page

Facebook (Figure 2) was chosen as Must Farm's primary digital engagement tool owing to its large userbase, ease of content sharing and the platform's ability to facilitate conversations between individuals and the project. Additionally, the platform was easily accessible via mobile devices and computers, making it straightforward to post content and respond to users from the excavation. Posts were mainly created and shared directly from the site using a laptop and mobile internet. However, off-site days were used to schedule detailed content, such as blogs, where a more stable wired connection was required.

From the beginning of the project content was designed to be easily readable by specialists and non-specialists alike, neither jargon-heavy nor excessively simplistic, without compromising the quality of the information. Facebook posts, blog entries and photographs were all produced by the digital outreach officer and based on different elements of the excavation. Members of the Must Farm team regularly highlighted finds,

areas of interest and working theories that they felt were important to discuss on social media.

A professional, shared voice was adopted as this was felt to reflect the unified nature of the project's excavation team and specialists whose work formed the basis for the collective interpretation of the site.

Facebook content fell into two categories: daily, progress posts and detailed Site Diary updates (Figure 3). Both were created with the intention of informing audiences about discoveries and the latest excavation progress. A decision was taken to challenge typical perceptions of archaeology as providing definitive answers. Instead, the digital content was designed to demonstrate archaeology as an interpretative *process* where theories are continually evolving and changing. Some of the information that was shared proved to be incorrect but was an accurate reflection of working site theories. Indeed, social media were employed to provide corrections and revised interpretations that were hoped to represent an accurate depiction of an archaeological investigation.
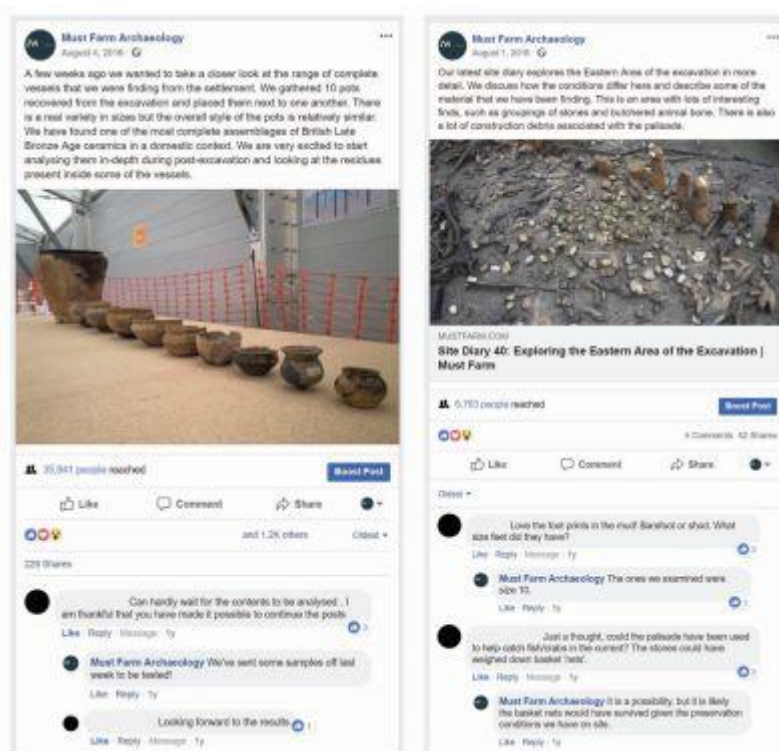

Figure 3: Examples of a daily progress post and Site Diary link

Digital content was designed to reflect a more complete image of archaeology beyond the physical digging and artefact discovery that dominate media depictions and public perceptions (Holtorf 2007). Less well-known scientific analyses, excavation and sampling techniques, recording and aspects of the day-to-day activities of the project were all shared. Additionally, social media were ideal means of actively *involving* audiences with the project. Content was designed not only to provide information, but to encourage engagement. A concerted effort was made to respond quickly to and interact with users, encouraging anyone with an interest in Must Farm to engage in conversations with the project.

3. Methodology

A detailed discussion of the excavation's public engagement strategy and its practical implementation can be found in Volume One of the Must Farm pile-dwelling settlement publication (Wakefield [forthcoming](#)). This article focuses on the investigation of the Must Farm project's use of Facebook and is designed to better understand audiences' reception of the outreach and assess its effectiveness.

Evaluations are both quantitative and qualitative, utilising Facebook's native analytical tools and explorations of user interactions and comments. Equally, an examination of the Must Farm project's digital audiences on this social network will be conducted utilising demographic information gathered from Facebook's metrics.

The Must Farm project ran between June 2015 and August 2016 although the digital outreach component did not begin until the main part of the excavation was underway in October 2015. The primary page data for this research is drawn from the dates between 6th October 2015 and 8th August 2016, during which period daily posting, comments and interaction took place. More detailed individual post metrics are examined between April 2016 and August 2016 to enable a more rigorous qualitative and quantitative study of content.

This article uses the National Co-ordinating Centre for Public Engagement's (NCCPE) definition of engagement. The NCCPE define engagement as 'a two-way process, involving interaction and listening, with the goal of generating mutual benefit' (NCCPE [2020](#)), which emphasises the importance of multi-directionality.

3.1 Quantitative data

The data used in this research are drawn from the Must Farm Archaeology Facebook Page's collected *Insights. Insights* is an in-built analysis tool designed to help Page owners better understand audiences and how they interact with content (Facebook [2018a](#)). Page and Post data were gathered during the excavation by the digital outreach officer and entered into Microsoft Excel spreadsheets for easier management. Table 1 contains a glossary of relevant Facebook terms.

Table 1: Glossary of Facebook terminology: General Terms / Insight and Metric Terms

General Terms		
Facebook Term	**Definition**	**Notes**
Page	A Page is a Facebook webpage dedicated to a topic, location, individual etc. They 'enable public figures, businesses, organizations and other entities to create an authentic	Unlike private user profiles, 'Facebook Pages are visible to everyone on the internet by default' (Hicks [2010](#))

and public presence on Facebook' (Hicks [2010])

News Feed	Facebook's News Feed is a 'constantly updating list of stories' displayed to a user when accessing their account (Facebook [2018e]). A complex set of algorithms controls what content appears within News Feeds	'News Feed includes status updates, photos, videos, links, app activity and likes from people, Pages and groups that you follow on Facebook' (Facebook [2018e])
Post	A Post is a piece of content created by a Facebook Page (or user). This may take the form of text, images, videos or a combination of these	Posts can receive different types of interaction including Likes, Reactions, Shares and Comments
Comment	A Comment is typically a publicly visible response to a piece of Facebook content. This can take the form of text, emojis, images and links. Users are able to reply to existing Comments, creating conversation threads	Anyone who can view the video or photo can view a Comment
Share/Sharing	A Share occurs when a user chooses to repost a piece of Facebook content, which is then displayed on their News Feed for their friends to see and respond to	When a user chooses to Share a post, they can add their own text to it and tag other Facebook account holders. Shares can occur on already Shared content
Messages	Messages refer to private, email-like conversations that users can engage in with Pages. These are not publicly visible	Owing to their private one-on-one nature, Messages are not studied in this research
Followers	Users who have chosen to Like a Page or subscribe to its updates. When a Page publicly shares content it appears in a Follower's News Feed	A Page can have more Followers than Likes. It is possible, though less common, for users to Follow a Page without Liking it
Likes/Liking	Likes are 'a way to let people know that you enjoy it without leaving a comment' (Facebook [2018b]). When a user Likes a Post the action is displayed in their News Feed and below the content itself	

Reactions	'Reactions are an extension of the Like button to give people more ways to express themselves and share their reaction to a post' (Facebook 2018f). Facebook (2018f) designed them 'as a quick and easy way to express how you feel'	Current Facebook Reactions are Like, Love, Haha, Wow, Sad and Angry emojis.
Love	Considered a positive user response, a more intense 'Like'	❤️
Haha	Hahas reflect positivity, though they may be employed in a sarcastic, rather than humorous, manner	😆
Wow	Wows show user excitement and awe at content	😮
Sad	Sad emojis may not always represent negative user Reactions. Their use can indicate disappointment stemming from the conclusion of something audiences have enjoyed	😢
Angry	Angry responses appear to be largely used to communicate negative forms of feedback	😡

Facebook Insight and Metric Terms		
Facebook Term	**Definition**	**Notes**
Impressions	The total number of times that a post from a Page is displayed in a specified period	Users may see a post displayed multiple times in their News Feed, producing numerous Impressions from an individual
Reach	The total number of unique user views	Reach can apply to specific content, such as posts, or the Page itself. All Reach for the Must Farm Archaeology Facebook Page was Organic, no paid advertising was used
Engagement	The total number of clicks on content or a Page by unique users	Includes post clicks, comments, likes and shares
Negative Feedback	Total of four groups of negative post interactions	Negative Feedback groups are Hide Post, Hide All Posts,

		Report as Spam and Unlike Page
Hide Post and Hide All Posts	Users can opt to hide a Page's content from their News Feed, either temporarily or permanently	These options are available to all Facebook users, not just Followers of a Page
Report Spam	Notifies Facebook of frequent, repeated unwanted content appearing in a user's News Feed	This option is available to all Facebook users, not simply Page Followers
Unlike	An Unlike occurs when a Follower/subscriber opts to no longer receive a Page's content	Not only does a user that Unlikes a Page stop receiving notifications, the Page itself loses this individual from its Follower totals. Only available to Page Followers
Daily Page Reach	The number of unique users who saw any content associated with the Page	
Daily Engaged Users	The number of unique users who clicked on any Page content	
Daily New Likes	The number of new people (unique users) who have liked a Page per day	
Total Page Likes	The cumulative number of unique users who have Liked a Page	

Since the completion of the excavation more detailed analytics have been made available. However, these were only available for a limited period of the project. Areas of analysis will therefore centre on consistent, available, categories of study.

3.2 Qualitative data

Qualitative analysis was considered essential, particularly given that archaeological social network studies are dominated by quantitative research (Perry and Beale 2015; Walker 2014a). Qualitative content analysis was selected as it was suited to characterising interactivity present in the volume of social media comments. Categorisation would permit the recognition of engagement, particularly in identifying the relevance of user responses, instances of dialogue and the frequency of queries posted to the Page.

Manual coding was selected as it was felt that an automated process would not reliably capture subtleties and sentiments present within the comments. Human agency enabled identification of relevant instances of dialogue, discussion and engagement. Equally, the total number of comments was not so large as to necessitate finding or developing an automated tool.

Content analysis has been applied to social media comments across a range of platforms covering various subjects (Chew and Eysenbach 2010; Pantelidis 2010; Shen and Bissell 2013; Waters and Jamal 2011). For this study a coding frame was developed based on Neuendorf (2002), Rubin and Rubin (2005) and Schreier (2013). Codes were initially generated by identifying emerging trends from the data and a trial coding was conducted by the author based on 400 randomly selected user comments. Following this initial trial, the codes were refined and expanded. A second trial coding was then carried out by the author, which was subsequently re-coded 14 days later to test reliability, in accordance with Schreier (2012).

Neuendorf (2002) stresses the importance of a reliable coding frame being usable by multiple people. As coding of the data would be carried out principally by the author, it was decided to use multiple individuals to carry out a reliability test on the categories developed from preliminary research and the trials. This would ensure the coding frame was robust and that comments could be clearly defined when examined by others. One hundred comments were chosen and coded by the author and two others: an archaeologist and a digital heritage practitioner.

Cohen's *kappa* was then used to calculate the agreement coefficients between the author and the two trial coders (Neuendorf 2002). The first *kappa* yielded an agreement of 0.92 while the second was a lower value of 0.76. After discussions with the coders it was necessary to clarify several classifications, where a degree of ambiguity had resulted in the lower second *kappa* value. These improved definitions ensured the characteristics for code assignments were clearer and it was felt that the coding framework was reliable enough to be applied to the full dataset. Coding categories are outlined in Table 2.

Table 2: Outlines of the coding categories into which User Comments were sorted

Code/Label	Definition	Characteristics	Example
Content Questions	Questions directly related to the content of posts	Questions linked to images or contextual descriptions of regular posts. Alternatively, queries resulting from Site Diary blog contents	'Are there any scrape marks on it? And is that Flint or shell temper?' 'Was it found inside or outside the dwelling?' 'Is that another pot that the big one is sitting in?'
General Questions	Generalised questions unrelated to specific post details	Any relevant questions including those related to archaeology, excavation practices, the Late Bronze Age, artefact usage or the project	'Are you doing dendrochronology?' 'Were communities generally self sufficient for things such as pottery production at that time or were there centres of excellence that produced pottery and sold or traded it on?'
Interpretation	Comments offering	Comments interpreting the	'Tying up a boat or something to do with fishing perhaps?'

	interpretation and suggestions	information or images being shared. Users may offer theories, suggestions, possible explanations for the use of artefacts and their presence on site etc	'They must have had containers so could this be a wicker like structure?' 'I suspect that they were made here perhaps in the fens.'
Conversation	Discussions and replies focused on relevant archaeological themes	Inter-user and inter-page comments and replies dealing with archaeological subjects and related aspects of the excavation and finds	'Somewhere in the Roman record (Tacitus?) it mentions that Britain was famous for its hunting dogs, which would almost certainly have been greyhound/deerhound type lurchers.'
Excitement	Comments displaying excitement and enthusiasm	Comments displaying amazement at the archaeology, anticipation for more, awe at discoveries etc. Positive phrasing such as 'wow', 'fantastic', 'cannot believe this' etc	'WOW' 'I'm excited too!' 'That's incredible!' 'Oh my how wonderful, it's beautiful.'
Compliments	Positive comments demonstrating admiration for the archaeology or project	General praise for the excavation's methodology, the quality of the artefacts being unearthed, the condition of the material present, dedication of the archaeologists etc	'Amazing the preservation of organic materials at this site.' 'fabulously preserved and excavated. Well done.' 'Wonderful delicate work you archaeologists.'
Humour	Humorous comments	Comments that are light-hearted including jokes, puns, comparisons and references	'Bronze Age tupperware? ;)' 'Just 'axing- can ya "socket" to me?' 'Love the sharp wit..ahem'
Negative Comments	Negative comments and complaints	Negative posts relating to any aspect of the project or its content	'I am beginning to be suspicious.' 'A group of Japanese can safely visit the site but as a local resident I can not get near the place.'

Digital Outreach Praise/Thanks	Positive comments focused specifically on the online outreach programme	Praise for the digital elements of the outreach. Includes frequency of updates, quality of information, responsiveness of the page etc	'Loving all these updates, so thank you very much!' '....thank you for sharing these great posts guys....!!' 'You are giving thousands of people so much pleasure reading and seeing the progress you are making. It's good that you share all your wonderful experience with us all to make it more interesting.'

It was determined that comments that possessed multiple qualifiers would be coded into all relevant categories. This technique had previously been applied to social network posts (Chew and Eysenbach 2010) and allows for longer comments to be coded without losing information. Additionally, only comments left directly on Must Farm Archaeology Facebook posts were chosen for content analysis. All comments were anonymised for the study and no data were kept on individual users.

While it is possible to see additional Comments left on an individual or group's Shared posts, many are inaccessible owing to users' security settings. Therefore, for consistency and to respect user privacy only the primary Page Comments were selected for coding. Similarly, Page Messages were not examined as these were private, direct conversations between individual users and the project.

4. Data Analysis

Between 6th October 2015 and 8th August 2016, when the digital outreach was in effect, 306 posts were published covering 302 days of the excavation. Six days during the Christmas 2015 period did not feature content owing to the excavation standing down for the holiday. Rarely, multiple posts were published per day, typically during media events when the Page received additional attention.

Of the posts Must Farm Archaeology shared, 265 were excavation updates combining images and contextualised descriptions. The remaining 41 posts summarised and directed users towards more detailed Site Diaries hosted separately on the main Must Farm website. All Facebook metrics were organic as no paid marketing was employed at any stage of the project.

4.1 Metrics: initial growth and media coverage

Digital interest in the project was limited during the early months of the excavation. Once regular site updates began there was an initial surge in Page Likes. On the 10th October 2015, the first week online content was shared, 529 unique users followed Must Farm (Figure 4). Between October and the beginning of January, a steady stream of new followers liked the Page with an average of 15 new users per day. The first three months

of the project produced a mean Daily Page Reach of 2117 with Daily Page Engagement averaging 186 clicks each day.
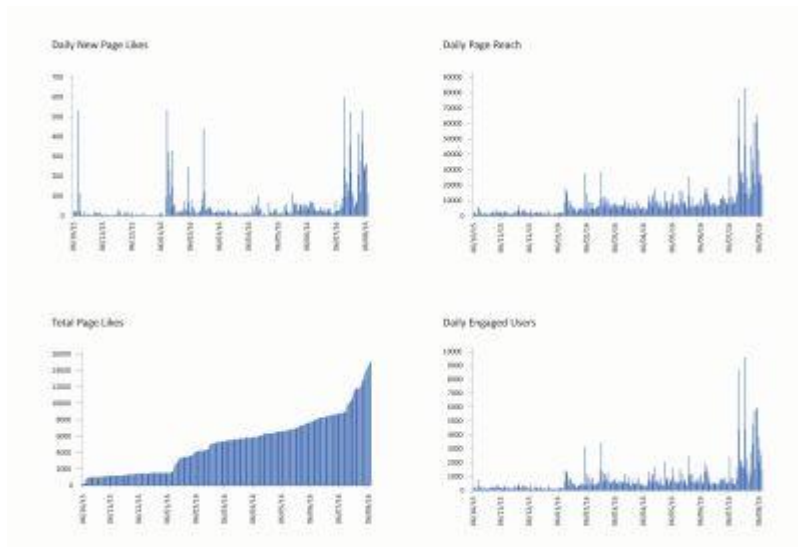

Figure 4: Facebook Metrics: 6 Oct 2015 to 8 Aug 2016 (Daily New Page Likes, Total Page Likes, Daily Page Reach and Daily Engaged Users)

These initial months demonstrate the slow, though consistent, development of the project's digital presence (Figure 4). Delivering regular content was essential in creating and maintaining momentum. It was critical to attract users by interacting with them and provide information on the project. While the visibility of the Page gradually improved, interactions with users remained disappointingly low.

Media days were scheduled at periodic intervals to raise awareness of the project and its discoveries. These were designed to tie in with significant excavation milestones to provide immediate, arresting visuals for the media. The first of these events took place on 12 January 2016, with journalists shown the site by the archaeologists, Historic England and Forterra.

The first media event brought the site wider attention and succeeded in capturing the public's imagination. Must Farm received coverage beyond the most optimistic expectations (BBC News 2016a; Kennedy 2016a; Knapton 2016; Mount and Gray 2016; Sheridan 2016), included foreign interest (Castle 2016; Perez Maestro 2016) and was even parodied by satirist websites (The Daily Mash 2016a; 2016b).

Prior to this event the project's Facebook Page had a relatively small following of 1702 users. However, it had developed as an easily accessible archive of 92 daily updates alongside 12 detailed Site Diaries. All content contained images accompanied by contextual detail describing a range of distinct aspects of the excavation. The site's narrative had been designed to be versatile and suitable for casual viewers and those who sought a more complete account of the excavation processes.

The first media event had a noticeable impact on most of the Page's metrics, with substantial spikes in Facebook *Insights* data (Figure 4). These large increases in metrics also occurred on subsequent media days; 19th February 2016 and 14th June 2016. The coverage of Must Farm by radio, television and newspapers was clearly instrumental in

raising the profile of the excavation and its discoveries. The public appeared fascinated by the site and, seeking more information, many discovered and followed its social media presence.

4.2 Higher visibility content

Media coverage was not exclusively responsible for spikes in metrics. On many occasions individual posts proved extremely popular with users, attracting many views, shares and comments. This content invariably consisted of striking images of archaeology including preserved textiles, knotted rope and metalwork. While every Facebook post had a carefully chosen visual element, alongside its contextual description, these updates resonated instantly with audiences.

Such enhanced popularity was likely a result of the objects being recognisable and relatable to modern users. These were more traditional archaeological images of impressive and well-preserved finds that required little explanation. Indeed, the familiarity of a 3000-year-old bobbin and the beauty of a socketed axe made them perfect for sharing and commenting on. The high numbers of shares and comments led to these posts appearing widely in Facebook users' News Feeds, increasing their Reach considerably.

The spread of these posts illustrates the power of social networks to disseminate content. The most successful posts (Table 3) reached significant numbers of users and were widely shared. Most of the posts dated from the end of the excavation when some of the most notable artefacts were discovered. During this phase of the project Must Farm Archaeology had over 10,000 followers, greatly increasing the reach of posts through sharing and interactions.

Table 3: Must Farm's ten most successful posts. Total Reactions, Comments and Shares incorporate off-page metrics including Comments and Likes on shared posts

Date of Post	Brief Description	Unique Users Reached	Total Reactions, Comments and Shares
21/07/16	Cleaned ball of thread	114623	6632
02/08/16	Bobbin with wrapped thread	86167	4865
29/07/16	Ball of thread on palm of hand	80336	3349
14/07/16	Video of socketed axe *in situ*	71237	4433
14/07/16	Close-up of textile	63786	3156
28/07/16	BBC documentary notification	48160	2447

04/08/16	Line-up of vessel sizes	35941	2208
03/08/16	BBC iPlayer notification	35401	1849
22/05/16	Vertical post with axe marks	30952	1627
05/07/16	Rope attached to causeway	29294	1355

These posts are particularly visible within Facebook *Insights*, which display substantial increases (Figure 4). Highly statistically successful posts provided a temporary effect on the Page where subsequent content also benefited from increased attention. The greater number of shares and interactions from these posts placed content from Must Farm Archaeology in a larger number of user News Feeds, an effect that typically lasted 24-48 hours. Posts that receive significant attention can clearly provide a substantial boost to a Page's visibility and increase its userbase without the need for any external media coverage.

While these posts are undoubtedly positive for raising an online outreach project's profile they do not represent the reception of regular content. Of the 306 posts to Must Farm Archaeology only the top five from Table 3 could be considered to constitute a *statistically* highly successful post. Understanding the reception of all content, numerically effective or otherwise, is far more important for assessing the impact of a project.

4.3 Average Page and Post Metrics

Posts on the Must Farm Archaeology Page were intentionally varied in subject, covering everything from images of archaeologists excavating to specialists examining textiles *in situ*. While there were slight discrepancies in the popularity of content, once the Page had become established Posts seldom reached fewer than 5000 unique users (Table 4).

Table 4: Averages of key metrics. Multiple averages are presented including/excluding particularly high or low periods of traffic

	Daily Page Total Reach	Daily Page Engaged Unique Users	Number of Unique Users Sharing Page Content
Average (mean) Page Data – duration of project (6 Oct 2015–8 Aug 2016)	8645	775	308
Average (mean) Page Data – excluding final month of higher traffic figures (6 Oct 2015–13 Jul 2016)	6207	542	293

Average (mean) Page Data – excluding initial months and final month (11 Jan 2016–13 Jul 2016)	8386	731	377

During the excavation, content on the Page was seen by an average of at least 6000 unique users each day. A further minimum average of just over 500 individuals interacted with at least one piece of content daily on Must Farm Archaeology (Table 4). These averages are understandably lower during the growth of the page and far higher in the closing months, once total Likes had increased substantially. Over the final four months, the average Reach of an individual post was 14,510, buoyed by a larger Page userbase.

There is a consistent baseline to Page Reach figures that seems linked to the total number of Page Likes. Users who follow a Page will usually, though not always owing to Facebook's algorithms, be served content from it in their News Feed. This results in posted content being displayed to a group of users roughly equal to the total number of Page Likes.

Here lies one of the greatest issues with using social network metrics as a basis for measuring engagement. Once a Page has gathered an audience, any content posted will generally reach these users. Therefore, every post generates positive quantitative data. These figures steadily accumulate and can be used to deliver impressive totals. However, critically, these posts might not receive any *interactions* from users. A Page with 10,000 followers could share an image that will likely be seen by approximately the same number of users yet receive no comments, shares or reactions. Public archaeology often discusses *engagement* but do simple Reach statistics represent meaningful outreach? Should a user scrolling past a project's image on a News Feed be considered a form of public interaction?

4.4 Negative metrics

During the excavation, Must Farm Archaeology received a total of 1219 instances of Negative Feedback, an average of four pieces per day (Figure 5). Of these, 344 were Unlikes, most of which occurred on the main Page itself rather than on a specific post. Negative Feedback for the Page, including Unlikes, has a strong correlation with spikes in Reach from media events of statistically successful posts. However, the volume of negative feedback seems low when compared with the project's overall metrics.
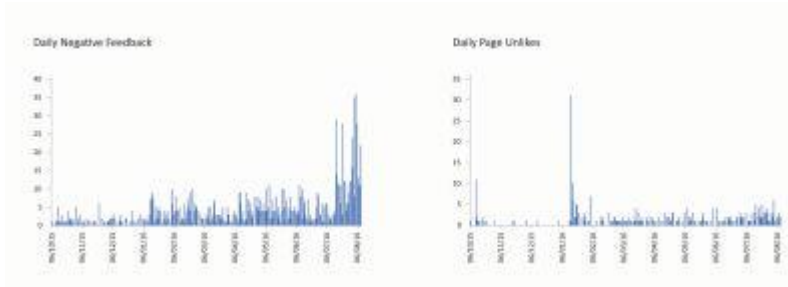

Figure 5: Negative metrics: 6 Oct 2015 to 8 Aug 2016 (Feedback, Unlikes)

The largest quantity of negative feedback received in a single day was 36 (Figure 5). This occurred on 3 August 2016 when a post with details of a BBC documentary was shared. Positive metrics for that date showed a Page Reach of 60,770, a total of 5848 Engaged Users and 372 new followers for Must Farm Archaeology. It seems that most Negative Feedback was received in response to heavily shared content continually reappearing in News Feeds, prompting users to hide material or Unlike the Page. Where individuals did choose to hide content, it seems that this was done primarily owing to the frequency individual posts were appearing to them during heightened periods of media interest or episodes of post sharing.

4.5 User interactivity and engagement

Engagement with audiences is a key component of digital and physical public archaeology. However, there is often no requirement for projects to undertake evaluation and little published work on the subject (Ellenberger and Richardson 2018; Ripanti 2020; Wilkins 2019). When evaluation does take place, there is typically no clear consensus on methods or measurements of engagement (Ellenberger and Richardson 2018). Indeed, often the only measurement of success for a public archaeological project is whether public engagement took place (Ellenberger and Richardson 2018).

Within the digital public engagement sphere, there are few, if any, set standards for measuring engagement. However, the ubiquity of metrics makes them an appealing source for gauging success and measuring user activity. Calls for greater understanding and adoption of evaluative frameworks (Ellenberger and Richardson 2018; Gould 2016; Ripanti 2020; Wilkins 2019) should be acknowledged. Public archaeological projects must determine what data are necessary to identify meaningful engagement and develop appropriate evaluative measures to document both successes and disappointments.

The following section examines common Facebook metrics used in discussions of engagement and critically assesses their roles in determining user interactivity and engagement in Must Farm's digital audience.

While Facebook's in-built analytical tools can provide a generalised statistical overview of a Page's digital footprint, it offers little fine-grained insight into genuine user engagement. Social networking sites are providing new forms of interaction that are currently poorly understood in digital archaeology.

4.5.1 Reach

Reach, the total number of unique users who view a post or Page, is an often-cited quantitative statistic in digital projects and is a primary measurement offered by Facebook *Insights*. Yet, Reach does not necessarily represent user interaction. Content simply appearing in a user's News Feed contributes to Reach, irrespective of whether they even acknowledged it. Pages with many followers are effectively guaranteed Reach on their content, though they may attract no other forms of interaction and, crucially, *engagement*. Reach is a valuable tool for gauging audience growth, increasing visibility and broadly measuring the popularity of content. Reach alone, however, should not be considered public engagement.

4.5.2 Engaged users

The 'Engaged users' statistic tracks 'the total number of clicks on content or a Page by unique users' and includes post clicks, comments, likes and shares (Facebook 2018a). This amalgamation of multiple categories provides a cursory overview of audience activity (Figure 4). Yet it is difficult to ascertain the degree of actual *engagement* an individual has with a piece of content.

At the most basic level, clicking on content can be considered user interaction but understanding these connections at this generalised level is impossible. Indeed, most 'Engaged User' stats are Post Clicks rather than Comments, Likes and Shares. These 'general' clicks may be to view an image in more detail or to expand its text description.

Only a fraction of clicks ultimately translates into a more qualitative interaction, via a Like, Reaction or Share (Figure 6). Of the 121 posts shared during the final months of the excavation, interactions in the form of Reactions, Comments and Shares constituted an average of just 29.6% of total Post Clicks. There is substantial variation in these percentages, with four of the posts achieving an over 80% interaction-click relationship and one below 10%.
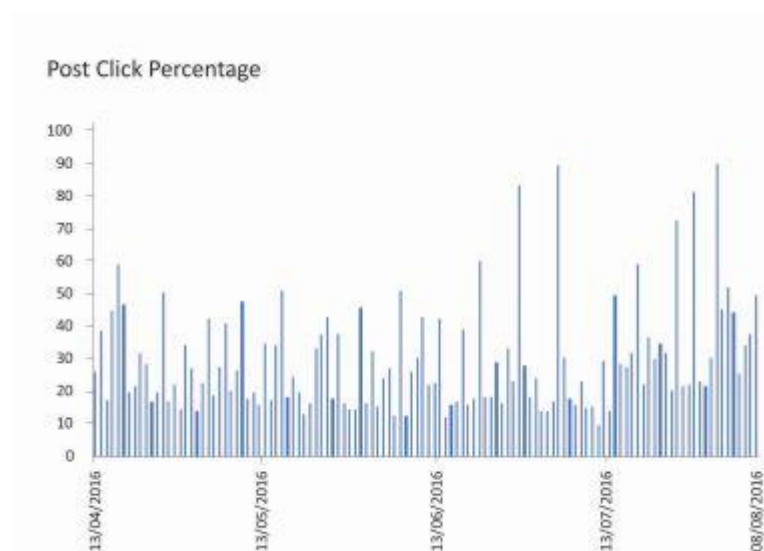

Figure 6: The percentage of Post Clicks that translate to Reactions, Comments and Shares left during the final months of the project: 13 Apr 2016 to 8 Aug 2016

Owing to the differences in these percentages it is difficult to identify precisely what content encourages audiences to engage more. Fifteen of the 25 highest Post Click to interaction percentages were Site Diary posts. These were statistically less successful than most content posts during the final three months, with an average Reach of 7878 (compared to the general average of 14,510 during this period). Similarly, they attracted less Post Clicks overall with an average of 636 compared to 2581 across all other posts.

Yet, the users who clicked on them subsequently interacted with them far more, with over half (57%) leaving a Reaction, Comment or Share (an average of 360 per post). This suggests that while not having the largest Reach or general Post Clicks, these

reports on the excavation were encouraging a higher percentage of tangible user interactions.

Content clicks are arguably the most simplistic form of user interaction and it is difficult to categorise them as a true form of user engagement. To gain a more fine-grained understanding of digital engagement it is necessary to explore forms of interaction where audiences are conscious of their role in the process, by examining Likes, Reactions, Shares and Comments.

4.5.3 Likes and reactions

Reactions incorporate one of Facebook's best-known features, Likes, alongside newer emoji-based interactions: 'Love', 'Haha', 'Wow', 'Sad' and 'Angry'. With a simple screen tap or mouse click, users can signify their approval of, or a basic emotional response to, a post. Facebook describes Liking a post as 'an easy way to let people know that you enjoy it without leaving a comment' (Facebook 2018b). The process of Liking a post has a visual record with a user's name displayed below the post and the event appears in their friends' News Feeds.

Likes appear more interactive than a Post Click as they reflect a conscious, visual expression of the appreciation of a post to both the content's creator(s) and the user's Facebook friends. The creation of a Like is a direct response to a post. Understanding what leads to these interactions is difficult and variable between individuals. Is a user liking a post purely because of an attractive image, its contextual description, a combination of the two or other reasons entirely?

Social media interactions are complex and Reactions can have subtle meanings and usages. 'Sad' responses can appear negative but may also be employed positively to reflect empathy with past events. It is difficult to identify a significant difference in the degree of engagement between Likes and Reactions, as they are still simplistic user-post interactions. Where Reactions do differ is they allow a Page owner a greater understanding of the nature of that interaction, by offering an insight into the basic emotions behind a user's click.

Reactions were made available globally midway through the Must Farm project and were far-less employed by users than Likes. During the final four months of the excavation a total of 5596 emoji Reactions were logged compared to 67,152 Likes. This suggests users were still familiarising themselves with this new interaction.

During the excavation Must Farm Archaeology received 74,878 on-Page content Likes, averaging 245 per post, with tens of thousands more on Shared content. Despite being a relatively basic form of engagement, these figures show that sizable quantities of users were making it known that they enjoyed the Page's content.

Likes closely mirrored the trends visible in both the Page Reach and Engaged User data, though with lower numbers of unique users (Figure 7). Content with large Reaches attracted high volumes of Likes with the most popular posts receiving over 1000 each. This appears to be a result of the instantly recognisable images that form the focus of these posts, making them appealing to users and more likely to attract interactions. The least Liked posts were typically Site Diaries shared early in the excavation. Here

audiences were smaller and content was predominantly text-based, making it less immediate.
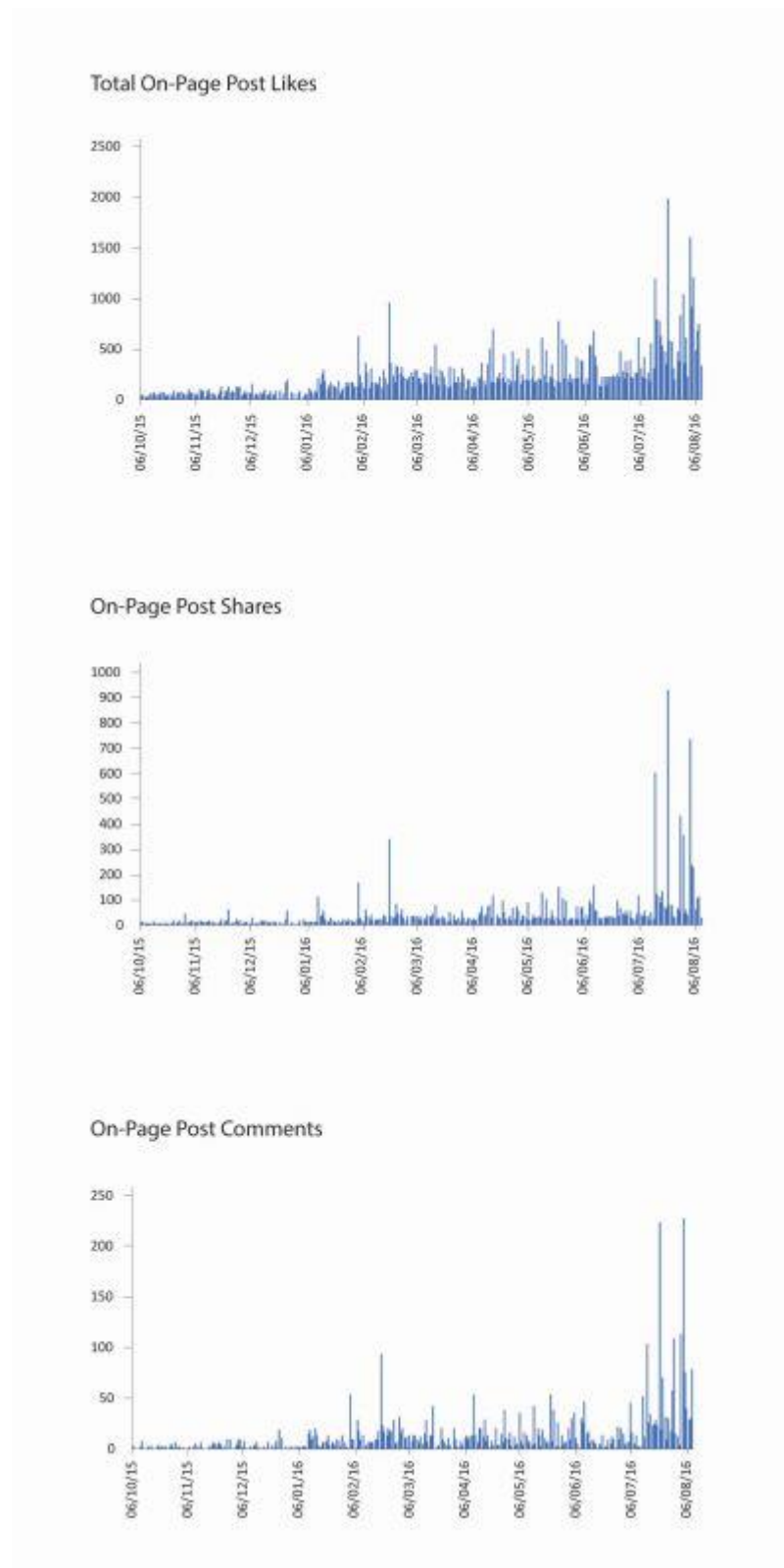

Figure 7: Facebook Metrics: 6 Oct 2015 to 8 Aug 2016 (On-Page Post Likes, On-Page Post Shares and On-Page Post Comments)

Reactions allow for slightly more insight into specific user engagement (Table 5). In the final months of the project, the two most frequently received Reactions were 'Love' and 'Wow'. Wows were received most frequently on traditional artefact-based 'discovery' posts. Loves proved the most popular Reaction and were consistently present, with 118 of the 121 posts from the final months receiving them. A Love seems comparable to a Like in terms of its function, acting as a positive indicator of user appreciation.

Table 5: Interactions received on 121 Posts from 13 Apr 2016 to 8 Aug 2016. Figures include interactions received on off-Page shares

Type of Interaction	Total Number Received	Average Per Post (mean)
Like	67152	554
Love	3018	25
Wow	2858	24
Haha	84	0.7
Angry	2	0.02
Sad	34	0.3

4.5.4 Shares

Shares are interactions where users can repost content in their News Feed. This can be a repost of the content as it originally appeared on a Page or, alternatively, can include their own commentary, impressions and interpretations. While it is straightforward to understand Shares numerically via Facebook *Insights*, it is much harder to study them qualitatively.

User privacy settings will often hide Shared posts, yet they will still appear in Page and Post statistics. This makes it difficult to understand the nature of the Share itself. Did users simply repost the content or did they add to it, potentially including their responses to the material? Owing to the variability in their visibility and limited time, this research focuses on discernible on-Page Shares.

During the project, the Page had posts Shared 14,310 times (Figure 7) with thousands more off-Page Reshares occurring on individual user profiles, Groups and other Pages. High-Reach posts proved immensely popular sources for this type of interaction, with the ten most Shared posts accounting for 31% of all the Page's Shares. Only four of the 306 Must Farm Archaeology posts attracted no Shares whatsoever. Indeed, Shares follow the same trends present in Figure 4 where, as popularity grows, so do these statistics.

A Share, like Reactions and Likes, is another visible form of user engagement displaying a clear level of conscious interaction. Shares differ from Reactions and Likes as they offer users the chance to add text to the post as it is redistributed in their News Feeds. This text could be anything from a simple summary of the content, a direct endorsement, tagging other users or a critique of the post.

Table 6: Stats from 119 Posts from 13 Apr 2016 to 8 Aug 2016. A total of 121 Posts were made, although two were Reshares and do not include Share data

	Total	Average (mean)
Post Shares on Page	9748	82
Visible Shares on Page	3125	26
Visible Shares on Page with User Text on Reshare	840	7

In terms of interaction, this is a more exciting prospect than a Like or Reaction, as users have the potential for a greater degree of engagement with content. The ability to add an opinion or contribute an interpretation is appealing for archaeologists as these forms of engagement are more meaningful. However, it seems far more common for a Share to be a blank reposting of content rather than one with accompanying user-generated text (Table 6). Of the visible 3135 Shares on posts during the final months of the excavation, only a quarter of these were reposted by users with any attached text.

With most Shares devoid of user commentary, is there a discernible difference in the degree of engagement these interactions offer compared with Likes and Reactions? The process of Sharing, creating a new Post directly associated with an individual's account, arguably demonstrates a greater measure of engagement. Without any user commentary, the 'blank' repost appears as an indicator that this content is worthy of attention. Indeed, it actively encourages new engagement from a user's own Facebook friends via fresh Likes, Reactions, Shares and Comments.

Further detailed analysis of Shares is needed to gauge the extent of both user-added text and how widespread on-Share interactions are. Content analysis of user-created text on Shares and a quantitative exploration of interactions on visible Shared posts would undoubtedly provide valuable additional insight into these engagements.

4.6 Comments

Engaged Users, Likes, Reactions and Shares, all demonstrate measurable, though simple, form of unilateral engagement. Comments allow for more meaningful, expressive multi-directional conversation between online audiences and Pages. Not all Comments achieve this, or were intended to, and there are clear themes present in user responses that reflect different degrees of engagement. To explore user engagement, all 4361 comments left on Page posts were manually studied and coded.

Comments follow the general quantitative trends visible in Must Farm Archaeology's Page data, with peaks reflecting media events or popular posts (Figure 7). However, Comments differ as there are more fluctuations on a post-to-post basis, something visible in the peaks and troughs present between March and July 2016.

For the opening months of the project, Comments were low in number. This is undoubtedly a result of the Page still building an audience, something reflected across other metrics. It is also likely a result of users being unfamiliar with a responsive project that answered questions and was prepared to enter discussions. As time passed and

the Page answered questions, and went on to ask them of audiences, Comments increased.

With limited comparable datasets it is difficult to determine the influence that Must Farm's openness and responsiveness had on Comment figures. Audience feedback suggests substantial appreciation for the project's willingness to converse with users, but it may simply be a result of audience growth over time.

Once the project's Page was established, and users became familiar with its content, it quickly became clear that audiences were keen to join in. Within the comments of other news coverage (Kennedy 2016a; 2016b), users often directed others towards the project's website or social media presence for further information (Figure 8).

Figure 8: One of several comments left on media coverage of the project (Kennedy 2016a) directing readers to the project's website or social media

Several key themes present in user Comments were coded, with distinct categories highlighting different degrees of engagement (Figure 9). Across the coding groups several categories reflect a high degree of engagement by audiences, including Questions and Interpretation.
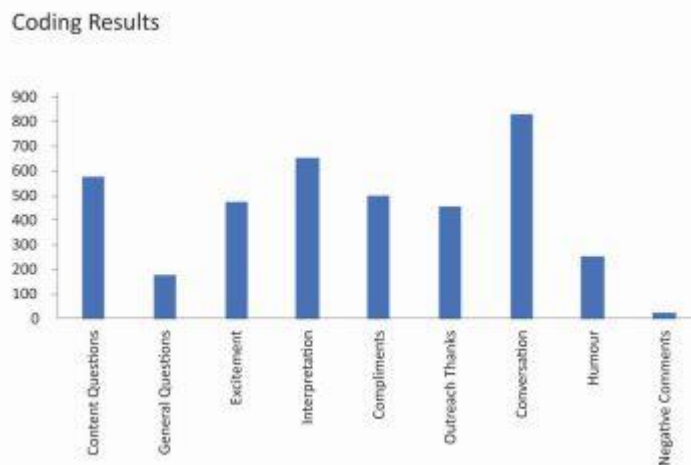

Figure 9: Coding results of all on-Page Comments received on the daily updates: 6 Oct 2015 to 8 Aug 2016

4.6.1 Content questions, general questions, interpretation and conversation

Archaeological questions are a positive form of engagement and indicate user interest and interaction. Two distinct areas of relevant, user questions were encountered in Comments. Content Questions connected directly to a post's image or contextual

description while General Questions were broader, concerning archaeological practice or the site.

Of the 4361 Comments posted, 576 included Content Questions and 186 were General Questions (Figure 10). Those asking questions clearly included archaeologists and professionals as the Page received specific enquiries about stratigraphy, technical aspects of artefacts, environmental sampling, scientific investigations and more. However, there were also many users who were clearly unfamiliar with both commercial archaeology and the Bronze Age and wanted to know more.
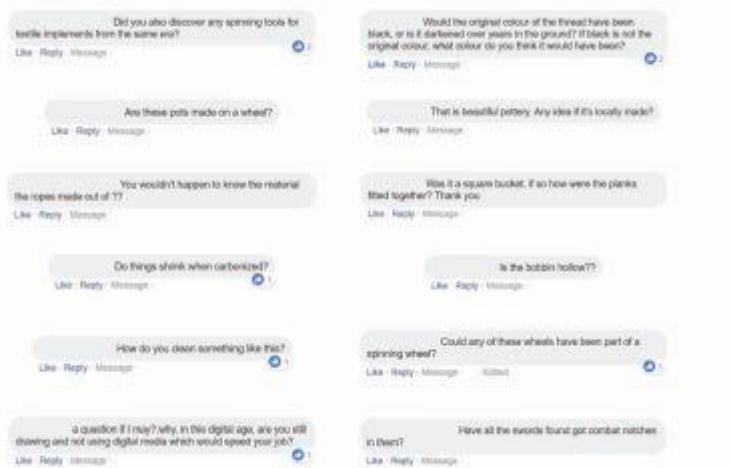

Figure 10: A selection of users' content and general questions

Many questions showed considerable familiarity with the excavation's previous updates, suggesting that users had been following the project online for some time. Questions were regularly left that referenced previous theories or enquired about artefacts unearthed earlier. The transparency of the project's digital output, highlighting that archaeology is a series of theories and presenting our rationale behind them, seemed to have a significant impact on user questions.

As the Page grew it was increasingly common to receive questions asking for more information on current hypotheses and the reasoning behind them. The presence of these requests was exciting, and it felt that the attempt to 'raise the curtain' on archaeological process as continually evolving interpretations, rather than facts, were succeeding.

Audience questions about the site's interpretation had a beneficial impact on the excavation team. Seeing working theories presented, and receiving questions, on social media helped members of the site team to continually evaluate and refine their hypotheses. An embedded digital outreach officer involved in excavating the site allowed him to provide feedback directly to users. His presence ensured that questions could be promptly answered and modifications to the site's interpretation fed back to online audiences.

Having users ask questions directly of the project, and more importantly answering these queries, allowed them to become a part of the excavation. This was positive engagement with people clearly taking the time to read and, critically, consider the

content being posted. General archaeological queries may represent a marginally lesser degree of engagement than those linked to specific content. However, they are still a highly valuable form of interaction between the public and the project, demonstrating meaningful two-way engagement.

It was satisfying to see questions on posts develop into archaeological discussions. These conversations would mostly involve responses between Must Farm Archaeology and the individual who initially left the query. As the Page grew other users would often join in, adding subsequent questions or their own ideas to the conversation.

Conversations relating to the project's archaeology, materials and theories accounted for 831 of the comments received, almost 20% of the total. These were mainly users discussing the content of the post to which they were responding. Owing to time constraints, a more detailed examination of the sub-themes encountered within these conversations was not possible.

Seeing comments discussing theories and archaeological ideas was satisfying as this was fulfilling the project's goal of encouraging audience involvement. Even more welcome was that both discussions and questions would often lead to individuals offering interpretations of the content detailed in the Page's posts.

Receiving audience interpretation of the archaeology was especially gratifying as it demonstrated an unexpectedly high level of engagement. In total, 654 Comments offering individual interpretations were received from users (Figure 11). There was a pleasing range in their scale and specificity, with some concerning the cause of the fire that destroyed the settlement and others offering opinions on how unidentified artefacts may have been used. Many were clearly from non-specialists, who often prefixed their suggestions with disclaimers that they were not archaeologists but still wanted to share their ideas.
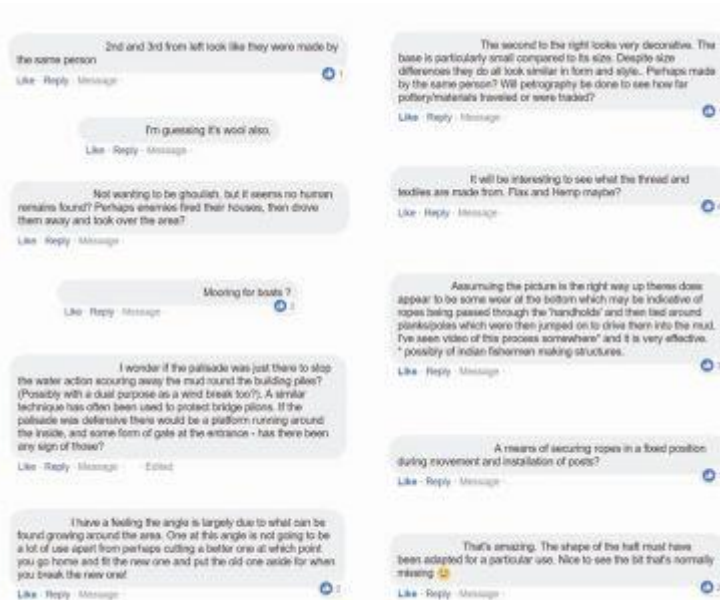

Figure 11: A selection of user Interpretation Comments

The value of such user interpretations could be seen in a post showing a then tentatively identified wooden artefact. The strange-shaped object was shared with text highlighting the team was uncertain of its use. Soon, many followers shared their suggestions (Figure 12), several of which successfully identified it as a flax-processing implement, which was confirmed by further research.
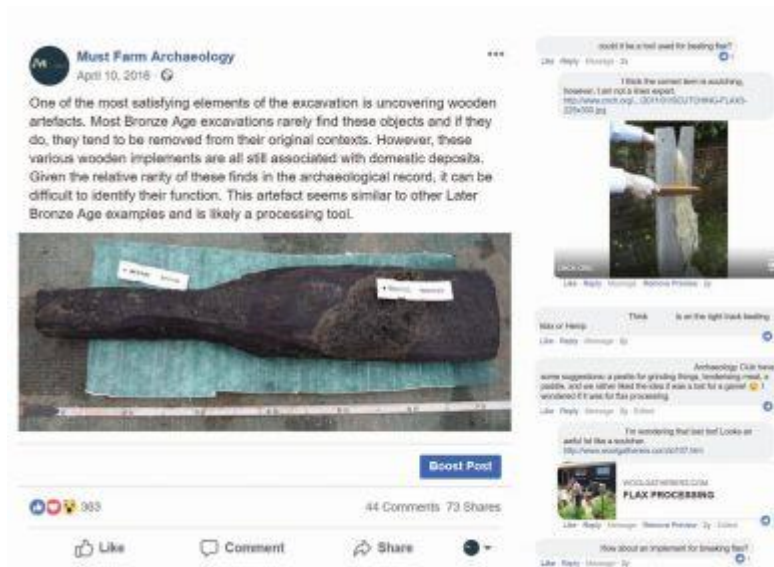

Figure 12: User Interpretations identifying a wooden artefact soon after it was excavated

Presenting the many unknowns of the archaeological process in a forthright and truthful way seemed to encourage users to add their own thoughts, regardless of disciplinary knowledge. Demonstrating that archaeologists do not always know the answers and were not instantly dismissive of user-submitted interpretations, helped reassure the audience that they could contribute to the project.

User interpretations of online content was one of the most successful elements of the project and a form of engagement that was hoped, though not necessarily expected, to materialise. Seeing a notable portion of the audience, including non-specialists, absorb the latest information the project was sharing, consider it and then offer their own interpretation of that material was hugely rewarding. Users were providing personal explanations and theories on an excavation that most were unable to visit.

Questions and Interpretations are strong indicators of healthy public engagement, demonstrating genuine interaction and connection to a site and its material. The fact that the Page was sharing enough information to allow the audience to contribute their own thoughts to a working excavation, irrespective of their geographical location, seemed particularly positive. These were interpretations of material that may only have emerged from the sediment a day before, adding a sense of immediacy to the engagement. Archaeological discussions gave users a dedicated space to speak with both the project and other followers.

4.6.2 Responsiveness

It was essential for the project to reply to user comments and show that Must Farm's outreach was not the typical one-way broadcasts common within archaeology.

Responsiveness was a critical component of Must Farm's digital outreach from the beginning. Where audiences were asking questions and interpreting archaeology it was vital to show users that these forms of communication were welcome.

The digital outreach officer, posting as Must Farm Archaeology, responded personally to 1035 of the 4361 Comments, a total of just under 24%. Most of these replies were answers to questions or discussions on user theories/interpretation. Responses also included thanking users for feedback and compliments and, less frequently, humorous replies to audience jokes. While the overall tone of the project's content was professional though informal, it was felt that occasional lighter answers helped to humanise the digital output.

Replying to almost a quarter of Comments made the project instantly visible as interactive and approachable. Page responses were intended to have a positive tone to encourage users while answering queries. There seemed considerable audience surprise at this degree of conversation, with many users thanking the Page for replying, and expressing their appreciation for feeling involved with the excavation.

During the early months of the project a smaller audience and fewer Comments made communicating with users much easier. At the beginning of the project few 'engaged' comments, offering interpretations or questions, went unanswered. Yet, by the end of the excavation the volume of queries had increased substantially, especially after the final media event in July. With one person carrying out the entirety of the digital output it was difficult to maintain the high degree of responsiveness, especially across multiple social networks.

In the excavation's closing months, timeframes were tight, and the digital outreach officer had to spend a greater portion of time excavating to meet the project's deadlines. So, during the final months, when the project was at its most visible, the digital interactivity for which the online outreach had become known, was reduced. To maintain any degree of dialogue with users, the digital outreach officer responded to Comments whenever possible. This was often done unpaid and outside of working hours.

Despite a poorer response rate at the culmination of the project, over 1000 replies represents an interactive digital outreach programme. The multi-directional conversations created through Comments and replies seem indicative of the positive professional-public engagements sought by archaeological outreach practitioners (Austin 2014; Bonacchi 2012; 2017; Goskar 2012; Gruber 2017; Henson 2013; Huvila 2013; Kansa and Deblauwe 2011; Morrison 2014; Walker 2014a; 2014b).

4.6.3 Excitement, compliments and humour

Three other positive categories of Comments demonstrating engagement can be seen in user Excitement, Compliments and Humour (Figure 13). Some 474 Comments expressed excitement at the archaeology, typically using short statements, such as 'Wow', 'That's amazing'. The rarity and quality of Must Farm's material was undoubtedly a major factor in attracting these responses.

Figure 13: A selection of Comments displaying Excitement, Compliments and Humour

It is possible that the enthusiasm present in the language of the Page's posts exerted an influence on generating these responses. The fact that Must Farm was inspiring a sense of awe in the project's audience was gratifying and a sense of real eagerness radiated from many of these Post responses.

Compliments were more varied, covering the quality of the excavation techniques, the preservation of material and the value of the archaeology. A total of 498 Comments contained compliments and were positive forms of interaction praising different components of the project.

Some 253 Comments were coded as Humorous and were present more frequently on highly shared content. Similar jokes tended to be repeated on posts, including users describing the discovery of a wheel as evidence for the first wheelbarrow or shopping trolley being dumped in a river. Puns were also common and often generated wordplay competitions among users. Few of these responses demonstrated prior knowledge of the archaeology with most simply remarking on the image or artefact depicted. Yet the presence of light-hearted content does illustrate the site permeating wider cultural awareness of the project.

4.6.4 Negative comments

Criticisms and complaints from users are perhaps the most important form of user engagement to identify what was unsuccessful about the online outreach. Negative feedback was rarely received, with fewer than 1% of all Comments (a total of 27) showing dissatisfaction with aspects of the project.

The most common grievance levelled at the online outreach was the small font size and dark background of the Must Farm website. Six users commented that they found it hard to read and requested changes. However, it took until after the excavation was completed for changes to text size, brightness and contrast to be implemented.

During the initial upsurge in public interest resulting from the January 2016 media event, traffic to the [Must Farm website](#) exceeded the hosting server's capacity, causing the page to go offline. Several comments highlighted user disappointment at this outage.

The lack of direct access to the public also drew negative comments, particularly from local people, despite the project running as many pre-booked tours as it could support. As access was not determined by the digital outreach officer and was heavily influenced by the situation of the excavation within an active quarry, there was little that could be done to address this.

Similarly, further objections about the ultimate museum destination of the site's material were encountered. Users expressed frustration that the Page could not tell them when or where artefacts would be displayed. Attempts were made to explain the lengthy conservation and study periods, alongside exhibition decisions resting with non-archaeologists. However, these responses from the project were seldom acknowledged.

While most negative feedback dealt with logistical or technical aspects of the project, a smaller number concerned users disputing the genuineness of artefacts. Most of these accusations were levelled at images of textiles, which were extremely fine, and several users found them to be unbelievably so. Fellow Page users responded to these Comments highlighting that these images were from a long-running excavation associated with Cambridge University and responding to the specific elements that the sceptics took issue with. Given the tendency for disagreements to escalate uncontrollably online, these conversations remained remarkably cordial.

Ultimately, this inter-user debate resulted in all but one person retracting their objections and self-deleting their Comments. Only two comments expressing doubt at the validity of the images and descriptions now remain. Sadly, no screen-captures were taken of these debates. That other users of Must Farm Archaeology, and not the project itself, tackled these accusations level-headedly only demonstrated the degree of affinity some people had developed with the project.

Other criticisms included users expressing dissatisfaction with English rather than American spelling, that the project was not well publicised online and that the entire site 'was not much to look at'. During the excavation only three instances of moderation were employed. One user was blocked for spamming irrelevant content and another had two sets of posts advertising their own unrelated book removed.

Negative comments can also include trolling, abuse and personal attacks. Little attention has been given to the enormous personal impact these interactions can have on practitioners (Perry *et al*. [2015](#)). While there is a growing awareness of the disturbingly high proportion of archaeologists who have received digital abuse in some form (Perry [2014](#); Perry and Beale [2015](#), 156; Perry *et al*. [2015](#)), there is still little dedicated guidance on safeguarding staff. This is a critical issue and an important provision that is explored further below.

4.6.5 Digital Outreach thanks and praise

The most rewarding aspect of the digital outreach was its reception by the public (Figure 14). Two posts specifically discussing the online presence of the project were the main sources of Outreach Thanks, attracting 253 Comments. A further 205 Comments

praised the digital output and were distributed across the page's daily posts. Ten per cent of all Comments received during the excavation contained specific thanks for the online engagement efforts.
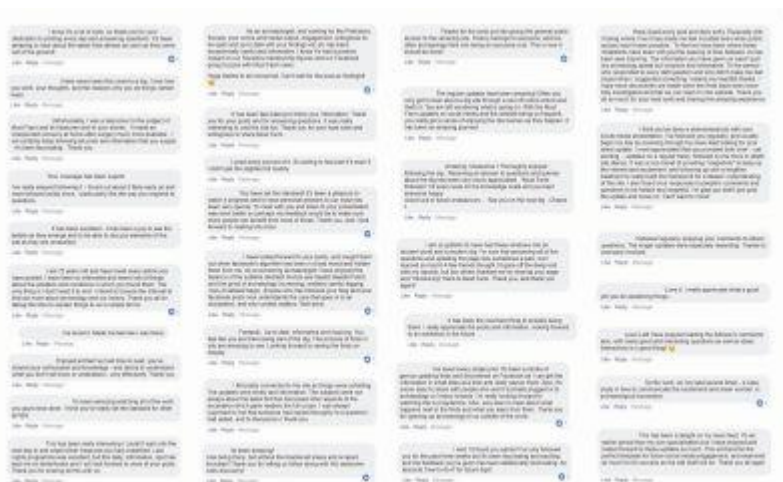

Figure 14: A selection of user comments responding to Must Farm's digital outreach

Many users thought the regularity of updates and responsiveness made them *feel* part of the excavation, irrespective of archaeological knowledge or geographical location. The speed with which discoveries were shared and the accessibility of the language used to describe techniques and theories were all highlighted as particular strengths. Similarly, the variation in content reflecting all aspects of the excavation, even the mundane, was welcomed by users who appreciated the insight into the process of archaeology. Users also noted the Page felt like a community, rather than an outreach tool.

It is evident from this positive feedback that audiences had seldom seen archaeology presented in this manner and were surprised that the frequency of posts persisted. The digital output had been carefully designed to try and encourage engagement by creating a feeling of openness and welcoming dialogue. Seeing the public respond to these strategies highlights the enormous potential social networks can offer to archaeological projects. Indeed, some users felt similar social media use by excavations should become a standard practice.

The volume of positive user feedback suggests that the audience experienced a significant degree of involvement in the Must Farm project. It was clear that there was a desire from the public for regular, detailed information. Users were fascinated by the exposure of archaeological process, including its working mechanisms and many ambiguities. Perhaps the overriding element in audience engagement was being made to feel included through user-Page dialogue that validated their interest and created a connection with the archaeology.

4.7 Audiences

Social media audiences are appealing targets for archaeologists involved in public engagement work. Historically, there has been a naïve perception within heritage that these users will be younger and more diverse than a traditional outreach-involved public.

However, little has been done to address Bonacchi ([2017](#)) and Walker's ([2014a](#); [2014b](#)) fears that social networks may simply reproduce established archaeological audiences online.

Owing to the scope of the analysis and methods of data collection it was not possible to conduct targeted demographic research on the audiences of Must Farm's Facebook Page. This would have necessitated examinations of their personal profiles, where available, to try and determine information beyond that provided by the native demographic tools provided by Facebook's *Insights.* A lack of ethical guidance and time meant that the research concentrated on the less granular Facebook *Insight* data.

Facebook *Insights* enables Page owners to see a breakdown of the age and gender of their followers, which can be compared with publicly available data displaying global user data (Facebook [2018c](#)). Facebook's worldwide demographics are dominated by younger users, with 59% of female users and 66% of male ones aged between 18-34. This generalised data supports the view that typical social media users are younger, as there is a substantial fall-off in older account holders, particularly those over 45 (Figure 15).
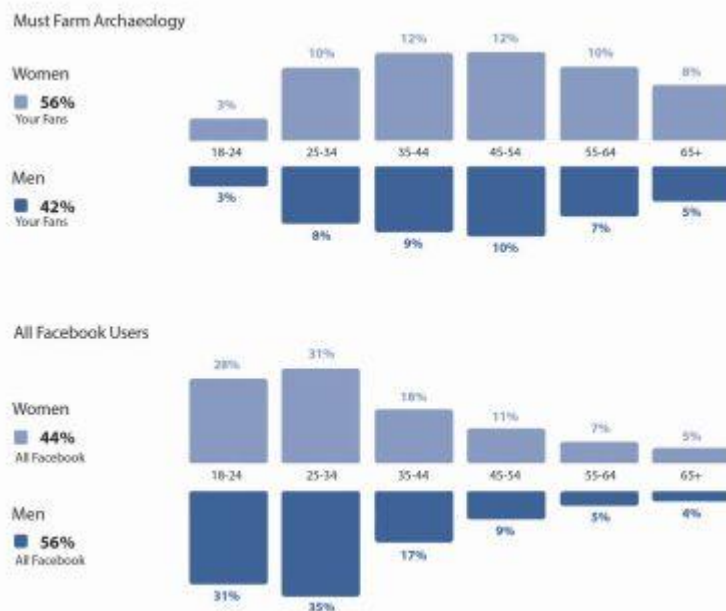

Figure 15: Comparison of Facebook's global demographics and those of Must Farm Archaeology (after Facebook [2018c](#))

Facebook's viewable categorisation of the gender and age of Page followers can only provide a general overview. As Spiliopoulou *et al.* ([2014](#)) noted, *Insight* data are based on information provided by users and assessing its accuracy is problematic. Many users may deliberately withhold or misrepresent details about themselves in their online profiles. Given the increasing prevalence of high-profile social network privacy breaches and the misuse of collected data, users may become increasingly reluctant to share information.

Insight data is fundamentally simple, providing only information on location, age and gender, a limitation noted by Gruber ([2017](#)). The lack of qualitative data makes it impossible to understand Page audiences in any meaningful way, particularly in

identifying groups that are typically absent from engagement. Yet, these general Facebook statistics can provide some level of insight into Page audiences.

A core concern was that the Must Farm Archaeology Facebook demographics would simply reflect the platform's global trends in users. The Page's audience, however, shows a surprisingly even distribution among ages that differs markedly from Facebook's association with younger users (Figure 17). Indeed, the evenness of groups covered seemed to suggest a more balanced audience, certainly in terms of ages. Particularly notable was the scarcity of Must Farm Archaeology Facebook users aged between 18-24 when compared with the high number generally present on the platform.

Across all Facebook users there is a heavy bias in gender, with 56% being male and 44% female. The Must Farm Archaeology Page is the reverse of this imbalance (Figure 15) with 56% of its audience female compared to 42% male. The remaining 2% is accounted for by Facebook's other gender options.

A notable parallel to this gender profile was reported by the Côa Valley Museum and Archaeological Park, which had a Facebook audience of 55% female to 44% male users (Fernandes 2018). The lack of datasets from other heritage social media projects makes further analysis difficult. Is it possible these reflect gender trends in online archaeological audiences or are a consequence of different social media use by men and women?

During the Must Farm excavation comments were left by users who mentioned they had little prior experience of archaeology. Yet comments were also frequently posted by professionals and specialists.

What impact does the involvement of fellow archaeological professionals in digital 'public' archaeological spaces have on the character of the engagements? Indeed, what ratio of professionals to non-professionals can archaeologists be expected to encounter on digital platforms and how can their interactions be best mediated? Examining these interactions in greater detail and qualitatively exploring *who* users are is a key area for future research.

Despite not all Facebook users sharing their location with the platform, there are some interesting potential insights this demographic information can provide. Some 7818 user profiles shared that they were from the UK, with the US the next most popular country with 4930 followers. Seven of the ten countries with the most users following Must Farm were in Europe.

Engaging local audiences was a key aim of the project's physical outreach (Historic England 2015). There were 521 Page followers from the nearby towns of Whittlesey, Peterborough or Huntingdon, demonstrating a healthy degree of local interest.

Must Farm did receive non-specialist media attention from overseas (see Castle 2016; Perez Maestro 2016). However, most international coverage of the excavation came from specialist publications and the project's digital content was shared widely in archaeology-themed Facebook groups, which have global audiences. Therefore it seems probable that international users became aware of the project via a pre-existing professional or casual interest in archaeology, rather than 'popular' news coverage. This suggests that an existing disciplinary attraction or professional association is more likely to account for these followers choosing to Like the Page. If this is the case, with a

significant degree of international users being involved in some capacity with archaeology, then to what degree is the audience representative of the wider public?

Prior work by Richardson ([2014](#)) examining Twitter revealed that the platform was increasingly used by archaeologists. It is unclear how many of Must Farm's audience are archaeological professionals, specialists or academics. The nature of numerous user comments encountered during the project revealed that there were archaeologists among followers, although further work would be necessary to gauge their proportion.

Quantitative analysis of demographics using Facebook *Insights* can provide an unfocused representation of Page audiences that is insufficient to *understand* users. Continuing to uncritically assume that social networks can easily provide access to new and increasingly diverse audiences is highly problematic. The lack of available datasets and limited application of digital archaeological outreach mean definitively challenging this perception is difficult. Detailed, qualitative research into Page users is still sorely needed to assess precisely *who* is accessing archaeological social media. Without a detailed understanding of audiences, it is difficult for digital public archaeology to move beyond impersonal, detached statistics that offer no real insight into genuine engagement.

5. Discussion

Must Farm Archaeology sought to create and deliver accessible, immediate content that helped emphasise the wider processes of archaeological work. Interacting frequently with users and providing a frank depiction of everyday excavation processes helped reduce archaeological authority, though did not remove it.

What is digital engagement and how should archaeological outreach practitioners assess social network success? *What* constitutes engagement within Facebook's *Insights*? Despite Must Farm's general achievements on Facebook there were numerous limitations that are important to address, particularly for future digital outreach work in archaeology. Indeed, is this project's impact repeatable or applicable elsewhere in commercial contexts?

Every element of Must Farm's digital outreach was designed to try to avoid distancing the public. Posts were crafted to be accessible using non-patronising language and to reflect all aspects of a commercial excavation, not simply appealing finds and exciting discoveries. It was essential to communicate precisely how often archaeologists *do not* know something and demonstrate the fallibility of experts. Equally, archaeology was shown to be a continuous, evolving process, and getting closer to an understanding of the past is both time-consuming and difficult.

Such openness helped build a sense of transparency for the project, providing users with an up-to-date glimpse of positive and negative events. There was a desire to share both the highs of reaching key milestones and the lows of working in freezing, damp conditions. This sense of inclusion, that transcended geography and user backgrounds, felt like a powerful opportunity that social networks are well suited to facilitate.

The project used social media's ability to disseminate data rapidly with daily posts and content created from material fresh from the ground. Commentators expressed

admiration at the speed with which information was shared. Sheridan ([2016](#)) noted the 'commitment to the instant dissemination of high quality information to a worldwide audience through Facebook, Twitter, and its superb website means that a hungry public can keep track of each new spectacular discovery within hours'.

The immediacy of information sharing led to news outlets creating stories based entirely on social media content. A BBC ([2016b](#)) and ABC News article (Thorbecke [2016](#)) were constructed from photos and quotes drawn solely from the Facebook page, without the need for a press release. Developing and maintaining the excavation's presence on social networks gave the project its own voice that was able to have an, albeit small, influence on current news coverage.

The complexity and scale of Must Farm's archaeology means the publication of the site will take years. Sharing regular updates during the project has created a lasting archive of the excavation process that is still easily visible online, a resource seldom available for a commercial dig. However, the suddenness with which these updates ceased is a critical issue and is discussed below.

5.1 Applicability and Scalability

The Must Farm project differed from many excavations as it uncovered extraordinary archaeology from the beginning. While its online use of social networks was well received by the public, how applicable and practical is this form of outreach to other projects? Attitudes from other archaeologists have varied, with several suggesting to the author that Must Farm's digital outreach was only effective owing to the quality of the archaeology, and it would not succeed in other contexts. Similarly, some have suggested few archaeological projects could afford the necessary budget to deliver digital engagement.

Practically, the Must Farm online engagement cost comparatively little. Its only expenditure was the hosting costs of a small website and the part-time wage for the digital outreach officer (equivalent to a senior field archaeologist). Slightly over 1% of the entire project's initial budget was spent on digital outreach, which substantially increased the excavation's visibility and delivered public engagement.

Commercial archaeology in the UK is a complex landscape of contract work with many barriers to outreach. Unfavourable attitudes towards public engagement are far from uncommon among both clients and archaeological management (Everill [2009](#); Goskar [2012](#); Nixon [2018](#); Orange and Perring [2017](#); Perring [2015](#); Southport Group [2011](#); Zorzin [2016](#)), despite a general level of support for outreach within the profession (Richardson *et al*. [2018](#)). Overcoming the ingrained institutional perspectives towards outreach in developer-led archaeology is undoubtedly one of the main obstacles engagement practitioners will have to battle.

Clients seeking complete control over communications (Zorzin [2016](#)) and archaeological management reluctant to fund activities with no direct economic benefit to their organisations are significant problems with no easy solutions. Given the current uncertainties surrounding the UK's construction industry and contract archaeology it is hard to see developers and senior managers coming together to fund and create public engagement initiatives.

Yet for larger and longer-term projects creating a digital social network presence for outreach using the Must Farm 'template' would clearly be achievable. Effective digital outreach could be realised without considerable cost, as the platforms are free to use and already provide a varied toolset for content management, moderation and post sharing. A simple digital camera, basic smartphone and mobile Wi-Fi connection are all that is required for on-site content production. A project would need to budget for an outreach position and ensure training and support were provided.

As both Goskar (2012, 36) and Orange and Perring (2017, 144-45) have noted, most commercial archaeology in the UK is short-term in character. Many projects are simple watching briefs, evaluation trenching, pipeline monitoring or rural excavations that uncover little archaeological material. In this context it is difficult to imagine clients becoming convinced of the need to engage with the public or contribute towards outreach.

Yet this work represents the mainstay of commercial excavation and is enormously under-represented in public depictions of the profession.

As a dedicated, consistent source, unit-specific social media could build a regular audience and share posts relating to all current fieldwork and post-excavation activities, rather than create fresh accounts for each project. Many of the largest UK units have adopted a social media presence, but this is often updated inconsistently, and their focus is typically on finds or event advertisements. These company social media accounts would be ideal platforms to begin producing more regular, varied digital content.

Using organisational accounts would develop momentum and provide diverse, reflective content from different time periods, excavation environments and techniques. Similarly, it would provide insight into multiple aspects of archaeological work from planning, execution and publication while simultaneously eliminating the downtime from fallow periods.

However, much stands in the way of the development of interactive digital public archaeology, particularly in commercial environments. Funding such work would be problematic as budgets are typically project-specific and few units have the luxury of a dedicated pool of resources to finance engagement. Similarly, the scarcity of outreach roles within the commercial sector (Aitchison and Rocks-Macqueen 2013) demonstrates the reluctance for units to invest in communication with non-specialists.

Indeed, inherent institutional prejudices towards public engagement (Goskar 2012; Orange and Perring 2017), particularly involving social media, may be the biggest barrier to the adoption of digital outreach. Demonstrating the financial value of *engaging* with the public to commercially motivated archaeological organisations presents a difficult, though not insurmountable, challenge. In an environment where archaeological work is becoming increasingly competitive and demand for staff is increasing, a successful outreach portfolio may ultimately prove to be of value in securing tenders and staff.

Must Farm's online engagement strategy showed what could be achieved on a time-limited commercial project by an individual with limited resources. A passion for openness and dialogue formed the underpinning of the project and was able to use social media to help deliver responsive, engaging content to users on both local and international levels. The transparency of the digital presence enabled individual users to

offer their own interpretations and insights into an ongoing excavation, often only minutes after a discovery or question emerged. The project was not without its limitations, but as an initiative on a commercial excavation demonstrated the immense potential for social networks to provide personal interaction with users in meaningful ways.

5.2 Degrees of Engagement

Using social networks for archaeological outreach provides projects with a wealth of different data to consider. Impressions, Reach, Likes, Reactions, Shares, Comments, and Clicks all represent various forms of user interaction that reflect different degrees of *engagement*.

A vital aspect of engagement should be its participatory nature (NCCPE 2020). For online users to engage there needs to be some identifiable form of interaction between individuals and an archaeological project. This need not be a detailed, personalised conversation but could incorporate subtler, though discernible, forms of Page interactions. Considering this, social media metrics should be viewed with greater scrutiny, especially in establishing whether this participatory component exists when the term engagement is used. Equally, seeking to establish *degrees* of user engagement is important in quantifying and evaluating digital public archaeology.

The ease with which social media metrics can be accessed has made them an appealing source of data for evidence of outreach. This seems especially true in an era when funding bodies and the Research Excellence Framework typically seek 'impact': demonstrable, quantitative evidence of successful public engagement. Against such a background it would be easy to see an environment developing where projects focused solely on constructing content to maximise statistics rather than making a genuine effort to communicate with users.

Impressions, Reach and Engaged Users all represent a rudimentary level of audience involvement with a Page or its content. From such generalised quantitative data it would be disingenuous to infer true audience *engagement*. Indeed, such metrics from public archaeological projects would be better viewed as indicators of visibility rather than engagement. Despite the basic character of this interaction, these statistics do have value in gauging the visibility of either a Page or a piece of its content.

Yet, as Richardson (2013) has noted, users may not directly interact with content but still contribute to social network metrics. How should 'lurkers' be regarded within digital engagement and how can their connection to a project be discerned?

Comments are a strong indicator of engagement, but it is necessary to understand their subtleties. Simply providing a generalised, cumulative figure offers little insight and is fraught with issues, as Facebook produces unrepresentative Comment totals that include Page responses and inaccessible on-Share replies.

Must Farm's Facebook presence is a single example of online archaeological outreach but it generated many forms of audience interaction. The project managed to achieve solid visibility figures with its posts appearing widely across Facebook, reaching hundreds of thousands of users. The project's outreach sought to go beyond this and

managed to attract multi-directional dialogues, personal interpretations and user questions.

Yet, despite many commonalities (posting, commenting, sharing) no social networking sites are truly alike. Therefore, this article is only able to offer direct guidance for analysing engagement on Facebook. However, many of the ideas that underpinned Must Farm's digital strategy - the regular posting of content, directly engaging users in conversation, encouraging interpretation and responses and being transparent about the archaeological process - could be effectively transferred to other platforms.

5.3 Limitations

The suddenness with which Must Farm's updates ceased proved to be a significant drawback for the project. Only during the final month of on-site work did attention turn to what outreach would take place when the physical excavation stopped. Owing to a lack of funding, both outreach positions finished at the conclusion of the excavation. Occasional post-excavation updates were initially shared, though these were infrequent.

Since the project concluded, new Facebook content has been sporadic. Just over 30 posts were shared between September 2016 and July 2018, a stark contrast to the 300-plus updates from October 2015 to August 2016. This drastic reduction in content had a profound impact on Page activity, both in visibility-based metrics and an absence of user interactions (see Table 7). Despite the lack of activity, Page followers continued to increase slowly. This appeared to be the result of the archive of content created on Facebook during the excavation.

The lack of post-excavation outreach resulted from the unexpected success of the digital engagement strategy and a lack of foresight to cover this stage of research. Similarly, there is a widespread precedent within public archaeology to depict certain facets only of the discipline. Typically, these involve the muddy, on-site unearthing of objects and the exhibition-ready artefacts handled by white-gloved curators with little in between. However, the post-excavation process is typically where interpretations are refined with the aid of scientific analyses, completed plans and careful study of stratigraphy, deposition and spatial patterning.

Table 7: The stark contrast in Must Farm Archaeology's Facebook metrics between the last active month and the Page a year later

	August 2016	August 2017
Page Posts	13	0
New Content Likes and Reactions	12198	0
New Content Shares	2043	0
New Content Comments	1228	0
Daily Page Reach	429041	5251
Daily Page Engaged Users	38151	452

Daily Page Likes	3681	120
Daily Page Unlikes	67	45

Must Farm's digital outreach sought to show audiences a more authentic depiction of archaeology, to help challenge typical authoritative presentations. Yet the abrupt cessation of updates did nothing to shed light on the traditionally poorly understood process of post-excavation analysis. This was a major shortcoming and updates would have maintained the momentum among its users into an unrepresented component of archaeological research.

Attempts were made to share updates on post-excavation, but the lack of a dedicated outreach budget meant there were only two such posts, both in January 2017. However, after interim reports for the project were produced, a new online programme was funded in July 2018 to produce monthly updates until the site's full publication. Whether this continuation can produce similar engagement after such a delay remains to be seen.

As the project's social media became increasingly popular, more attention was required to maintain responsiveness. As this responsibility fell on a single person, who had to divide time equally between excavation and outreach, this became exceedingly challenging in the final months of the excavation. The self-imposed schedule of daily updates, site diaries and responsiveness coupled with significant excavation responsibilities was perhaps overambitious. While Page replies were reduced during this busy period, the quantity of updates was not impacted.

Two part-time digital outreach officers would better address these difficulties. Splitting such a role would reduce individual pressure while still ensuring the practitioners possessed on-site knowledge and interpretations. Similarly, during quieter periods it would be possible for one person to increase their excavation role, returning to online outreach during media events or when substantial engagement was encountered.

Furthermore, a collective role would enable shared mutual support, an essential online safety-net for digital wellbeing. Must Farm's online outreach did not have a formal, predetermined social media policy. Future digital projects should create, and continuously develop, digital policies that offer clear guidance for content creators. Equally, companies employing the internet to engage with the public must ensure their own staff are safeguarded and have access to support. Given the worrying deficiency of support for archaeologists and a lack of institutional interest in digital abuse (Perry 2014; Perry and Beale 2015, 156; Perry *et al*. 2015), it is important to protect practitioners against the potential consequences of online work.

Must Farm's online presence did not take advantage of the range of media that were supported by social networks. Video content was barely used, a substantial shortcoming given the potential this format possesses for outreach. Despite the project possessing an HD video camera, no editing software or training was available and time constraints would have substantially restricted the quality of content.

While it would have been easy to create short videos on-site, the equipment available meant these would have had poor sound and lighting. It was felt this lack of quality would have diminished the site's archaeology by not adequately representing the

material or the excavation. Instead photographs and text were used, where artefacts could be clearly depicted and efficiently contextualised with accompanying descriptions.

Numerous users requested that video content be included in future outreach, particularly in feedback received at the end of the excavation. It was not clear whether audiences would have overlooked visual and audio shortcomings to have brief videos. Elsewhere, archaeological projects have integrated on-site vlogs into excavation coverage (DigVentures 2018; Tong *et al.* 2015) but work is needed to understand user expectations and reception of this content.

For future digital public archaeology projects livestreaming is appealing. Equipment (microphones, stabilisers) and mobile Wi-Fi devices are continually dropping in price and improving in quality, making portable set-ups increasingly real for archaeology. Such integrated social media tools would allow a new degree of project-public engagement. Archaeologists could reply in real-time to questions and instantly share *in situ* archaeology or artefacts. Further investigation of livestreaming's potential should be explored.

6. Conclusion

Must Farm's digital outreach has demonstrated that social media can be used to engage audiences. It is now over a decade since social media became an essential facet of modern communications. Yet, within archaeology, particularly the development-led sector, there is a reluctance to acknowledge this change. Companies and organisations are reluctant to invest in these online platforms, viewing digital public archaeology as an unnecessary expense, a technological fad, a waste of time and resources or, most likely, all three.

For online initiatives to be successful they must become a core component of public engagement, not just an afterthought or attempt to take advantage of a current technological fashion. Digital engagement should be carefully planned, developing coordinated strategies that mirror the progression of the project. Types of content, potentially including videos and facilitated livestreams, should be considered realistically and the frequency of posts must be maintained for the project's duration.

Outreach work should reflect the full process of archaeological research, not merely the excavation, and should be budgeted for accordingly. Online updates should continue into material examinations, scientific analyses and conservation, which are all aspects typically rarely presented. Rather than focus purely on the publicly recognised elements (Holtorf 2007; Zimmerman 2018), digital outreach needs to openly depict the processes of archaeology. Critically, the interpretative nature of the discipline should be highlighted, to depict archaeological knowledge production more truthfully.

Alongside creating varied content, online outreach officers should seek to encourage user interactions, particularly Comments. Creating a transparent representation of an archaeological project can help inspire valuable forms of engagement, especially questions and audience interpretation. Responsiveness is essential for cultivating an engaged userbase and ensuring prompt, professional replies to audience Comments should be a key priority for digital public archaeologists.

Archaeological social media use requires support, both financially and institutionally. Despite these platforms being free to use, digital outreach officers should have access to additional resources to enable full use of these technologies. Having a dedicated budget would allow practitioners to implement advertising at key junctures, temporarily raising visibility and attracting fresh users. Outreach officers should also be provided with adequate equipment to access accounts reliably and produce content in the field, including mobile web connections, portable devices and adequate elemental protection.

Equally important is that practitioners have reliable institutional backing, access to training and social media guidance. Given the increasing prevalence of online abuse and the potential for digital disputes to rapidly escalate, ensuring adequate support networks exist is essential. Ensuring that all members of an excavation team are aware of a project's online output, understand its intentions and to ascertain whether they consent to appear in posts is also vital.

As Perry ([2018]) argues, those practising outreach and communication should be embedded within fieldwork to integrate excavation and interpretation. As Must Farm's online engagement established, there is substantial value in an outreach practitioner being both an active field archaeologist and a voice presenting a project's research.

Archaeologists possess and continuously develop a complex set of unique skills. They can understand a site's stratigraphy, unpick delicate nuances in deposit formation and identify events from subtle differences in a sediment's colour. Many display a fierce enthusiasm for their work, its wider importance and demonstrate a strong desire to share this with the public. Upskilling archaeologists in audience communication and digital tools and bringing this knowledge and passion forward, in their own words, is far more valuable than parachuting public relations specialists into excavations. Investing in training excavators and developing dedicated outreach positions staffed by experienced archaeologists should be a key priority for public engagement work, both physical and digital in nature.

Against the difficult current archaeological backdrop of limited field archaeologists, skill shortages, low student numbers and a discipline that needs to demonstrate its timeliness and relevance to modern events, it has never been more important to communicate with, and truly engage, the public. Social networks have changed the conventional media landscape and it is essential for archaeologists to start learning this new language to create meaningful, personal interactions that can powerfully connect individuals with the past.

Acknowledgements

Bibliography

Aitchison, K. and Rocks-Macqueen, D. 2013 *Archaeology Labour Market Intelligence: Profiling the Profession 2012-13*. http://landward.org/landward/wp-content/uploads/sites/6/2013/10/Archaeology-Labour-Market-Intelligence-Profiling-the-Profession-2012-13.pdf [Last accessed: 28 May 2018].

Alberge, D. 2011 'Bronze age man's lunch: a spoonful of nettle stew', *The Observer*. https://www.theguardian.com/science/2011/dec/04/bronze-age-archaeology-fenland [Last accessed: 11 June 2018].

Austin, M. 2014 'Archaeological blogging and engagement' in D. Rocks-Macqueen and C. Webster (eds) *Blogging Archaeology*, E-book: Landward Research. 9-19. http://www.digtech-llc.com/s/2014-Blogging-Archaeology-eBook-35vc.pdf [Last accessed: 22 April 2018].

BBC News 2016a *Bronze Age houses uncovered in Cambridgeshire are Britain's 'Pompeii'*. https://www.bbc.co.uk/news/uk-england-cambridgeshire-35280290 [Last accessed 26 June 2018].

BBC News 2016b *New finds at Bronze Age 'Pompeii' Must Farm quarry*. https://www.bbc.co.uk/news/uk-england-cambridgeshire-35492599 [Last accessed: 28 June 2018].

Bonacchi, C. (ed) 2012 *Archaeology and Digital Communication: Towards Strategies of Public Engagement*, London: Archetype Publications.

Bonacchi, C. 2017 'Digital media in public archaeology' in G. Moshenska (ed) *Key Concepts in Public Archaeology*, London: UCL Press. 60-72. https://doi.org/10.2307/j.ctt1vxm8r7.9

Bonacchi, C. and Moshenska, G. 2015 'Critical reflections on digital public archaeology', *Internet Archaeology* **40**. https://doi.org/10.11141/ia.40.7.1

Castle, S. 2016 'Archaeologists in England tackle mystery of prehistoric village's rapid demise', *New York Times*. https://www.nytimes.com/2016/01/28/world/europe/england-must-farm-archaeology.html [Last accessed: 26 June 2018].

Chew, C. and Eysenbach, G. 2010 'Pandemics in the age of Twitter: content analysis of Tweets during the 2009 H1N1 outbreak', *PLoS ONE* **5**(11): e14118. https://doi.org/10.1371/journal.pone.0014118

DigVentures 2018 *Site Diary: Updates from our Excavations*. https://digventures.com/category/site-diary/ [Last accessed: 23 July 2018].

Ellenberger, K. and Richardson, L-J. 2018 'Reflecting on evaluation in public archaeology', *AP: Online Journal in Public Archaeology* **8**, 65-94. https://doi.org/10.23914/ap.v8i1.141

Everill, P. 2009 *The Invisible Diggers: A Study of British Commercial Archaeology*, Heritage Research Series No. 1, Oxford: Oxbow Books.

Facebook 2018a *Using Page Insights*. https://www.facebook.com/business/a/page/page-insights [Last accessed: 5 June 2018].

Facebook 2018b *Liking and Reacting*. https://www.facebook.com/help/452446998120360/ [Last accessed: 29 June 2018].

Facebook 2018c *Audience Insights*. https://www.facebook.com/ads/audience-insights/ [Last accessed: 29 June 2018].

Facebook 2018d *Facebook Live*. https://live.fb.com/ [Last accessed: 23 July 2018].

Facebook 2018e *How News Feed Works*. https://www.facebook.com/help/1155510281178725/?helpref=hc_fnav [Last accessed: 31 July 2018].

Facebook 2018f *Reactions*. https://en.facebookbrand.com/assets/reactions [Last accessed: 31 July 2018].

Fernandes, A.B. 2018 '"But will there be visitors?" Public outreach efforts using social media and online presence at the Côa Valley Museum and Archaeological Park (Portugal)', *Internet Archaeology* **47**. https://doi.org/10.11141/ia.47.5

Goskar, T. 2012 'Wessex Archaeology and the web: Amesbury Archer to *Archaeocast*' in C. Bonacchi (ed) *Archaeology and Digital Communication: Towards Strategies of Public Engagement*, London: Archetype Publications. 25-37.

Gould, P.G. 2016 'On the case: method in public and community archaeology', *Public Archaeology* **15**(1), 5-22. https://10.1080/14655187.2016.1199942

Gruber, G. 2017 'Contract archaeology, social media and the unintended collaboration with the public – experiences from Motala, Sweden', *Internet Archaeology* **46**. https://doi.org/10.11141/ia.46.5

Henson, D. 2013 'Digital media and public engagement in archaeology: an opinion piece', *Archäologische Informationen* **36**, 13-20.

Hicks, M. 2010 Facebook Tips: What's the Difference between a Facebook Page and Group?. https://www.facebook.com/notes/facebook/facebook-tips-whats-the-difference-between-a-facebook-page-and-group/324706977130/ [Accessed 31 July 2018].

Historic England 2015 *Must Farm Communications Plan*, Unpublished Document.

Historic England 2016 *Bronze Age Homes Unearthed in East Anglia*. https://historicengland.org.uk/whats-new/news/bronze-age-homes-unearthed-in-east-anglia [Last accessed: 26 June 2018].

Holtorf, C. 2007 *Archaeology is a Brand! The meaning of archaeology in contemporary popular culture*, Oxford: Archaeopress. https://doi.org/10.1016/B978-012373962-9.00253-3

Hunt, G., Morse, C. and Richardson, L. 2008 'Watching the past unfold before your eyes', *London Archaeologist* **12**(2), 41–5.

Huvila, I. 2013 'Engagement has its consequences: the emergence of representations of archaeology in social media', *Archäologische Informationen* **36**, 21-30.

Kansa, S.W. and Deblauwe, F. 2011 'User-generated content in zooarchaeology: exploring the "middle space" of scholarly communication' in E.C. Kansa, S.W. Kansa and E. Watrall (eds) *Archaeology 2.0: New Approaches to Communication and Collaboration*, Cotsen Digital Archaeology 1, Los Angeles: Cotsen Institute of Archaeology Press. 185-206.

Kelpšiene, I. 2019 'Exploring archaeological organizations' communication on Facebook: a review of MOLA's Facebook Page', *Advances in Archaeological Practice* **7**(2), 203-14. https://doi.org/10.1017/aap.2019.9

Kennedy, M. 2016a 'A bronze age Pompeii': archaeologists hail discovery of Peterborough site', *The Guardian*. https://www.theguardian.com/science/2016/jan/12/a-bronze-age-pompeii-archaeologists-hail-discovery-of-peterborough-site [Last accessed: 18 July 2018].

Kennedy, M. 2016b 'Perfectly preserved bronze age wheel unearthed in Cambridgeshire', *The Guardian*. https://www.theguardian.com/science/2016/feb/19/archaeologists-excavate-bronze-age-wheel-cambridgeshire [Last accessed: 18 July 2018].

Knapton, S. 2016 'Bronze Age settlement dubbed "Peterborough Pompeii" due to amazing preservation', *The Telegraph*. https://www.telegraph.co.uk/news/earth/environment/archaeology/12093895/Bronze-Age-settlement-dubbed-Peterborough-Pompeii-due-to-amazing-preservation.html [Last accessed: 26 June 2018].

Knight, M., Gibson, D., Ballantyne, R. and Robinson, I. 2015 *A Project Design for the Archaeological Excavation of the Must Farm Timber Platform*, Cambridge Archaeological Unit.

Knight, M., Gibson, D., Ballantyne, R., and Robinson-Zeki, I. 2017 *An Interim Report for the Archaeological Excavation of the Must Farm Timber Platform*, Cambridge Archaeological Unit.

Knight, M., Gibson, D., Ballantyne, R., and Robinson-Zeki, I. 2018 *Post-excavation Assessment and Updated Project Design. Volumes 1–4*, Cambridge Archaeological Unit.

Morrison, M. 2014 *Social Media and Professional Archaeology in Retrospect*. http://mickmorrison.com/2014/10/13/social-media-and-archaeology-reflections-from-a-jaded-professional/ [Last accessed: 21 April 2018].

Mount, H. and Gray, R. 2016 '"Pompeii of the Fens" is the best-preserved Bronze age home in Britain: Experts astonished by dwelling's condition as they unearth treasures from 3,000-year-old rugs and jewellery to human remains', *Mail Online*. http://www.dailymail.co.uk/sciencetech/article-3396219/Pompeii-Fens-best-preserved-Bronze-age-home-Britain-Experts-astonished-dwelling-s-condition-unearth-treasures-3-000-year-old-rugs-jewellery-human-remains.html [Last accessed: 26 June 2018].

NCCPE 2020 'What is public engagement?'. https://www.publicengagement.ac.uk/about-engagement/what-public-engagement [Last accessed: 24 April 2020].

Nixon, T. 2018 *What about Southport? A report to CIfA on progress against the vision and recommendations of the Southport Report (2011), undertaken as part of the 21st-century Challenges for Archaeology project*. https://www.archaeologists.net/21st-century-challenges-archaeology [Last accessed: 15 October 2019].

Neuendorf, K.A. 2002 *The Content Analysis Guidebook*, Thousand Oaks: SAGE Publications, Inc.

Orange, H. and Perring, D. 2017 'Commercial archaeology in the UK: public interest, benefit and engagement' in G. Moshenska (ed) *Key Concepts in Public Archaeology*. London: UCL Press. 138-50. https://doi.org/10.2307/j.ctt1vxm8r7.14

Pantelidis, I.S. 2010 'Electronic meal experience: a content analysis of online restaurant comments', *Cornell Hospitality Quarterly* **51**(4), 483-91. https://doi.org/10.1177/1938965510378574

Perez Maestro, L. 2016 'Bronze Age village yields ancestral secrets', *CNN*. https://edition.cnn.com/2016/01/23/europe/england-bronze-age-village/index.html [Last accessed: 26 June 2018].

Perring, D. 2015 'Involving the public in archaeological fieldwork: how heritage protection policies do not always serve public interests' in P.G. Stone and Z. Hui (eds) *Sharing Archaeology: Academe, Practice and the Public*, London: Routledge. 167-79.

Perry, S. 2014 'Digital media and everyday abuse', *Anthropology Now* **6(1)**, 81-85. https://doi.org/10.1080/19492901.2013.11728421

Perry, S. 2018 'Why are heritage interpreters voiceless at the trowel's edge? A plea for rewriting the archaeological workflow', *Advances in Archaeological Practice* **6**, Special Issue 3 (Interpreting and Presenting Archaeology), 212-27. https://doi.org/10.1017/aap.2018.21

Perry, S. and Beale, N. 2015 'The social web and archaeology's restructuring: impact, exploitation, disciplinary change', *Open Archaeology* **1**, 153-65. https://doi.org/10.1515/opar-2015-0009

Perry, S., Shipley, L. and Osborne, J. 2015 'Digital media, power and (in)equality in archaeology and heritage', *Internet Archaeology* **38**. https://doi.org/10.11141/ia.38.4

Richardson, L. 2007 'Dig goes digital in Prescot Street'. *London Archaeologist* **11(11)**, 287.

Richardson, L. 2013 'A digital public archaeology?', *Papers from the Institute of Archaeology* **23**(1), p.Art. 10, 1-12. https://doi.org/10.5334/pia.431

Richardson, L. 2014 'Understanding archaeological authority in a digital context', *Internet Archaeology* **38**. https://doi.org/10.11141/ia.38.1

Richardson, L-J., Hoggard, C. and Rocks-Macqueen, D. 2018 *What do UK archaeologists think of public engagement?'*, Landward Research Occasional Paper 2, Landward Research Ltd. https://landward.eu/wp-content/uploads/2018/09/LRop002_Richardson-etal_2018.pdf [Last accessed: 28 October 2019].

Ripanti, F. 2020 'Toward an intermediate level: making the most of evaluation in Italian community archaeology', *Public Archaeology*. https://doi.org/10.1080/14655187.2020.1761089

Rubin, H.J. and Rubin, I.S. 2005 *Qualitative Interviewing: The Art of Hearing Data*, Second Edition, Thousand Oaks: SAGE Publications, Inc. https://doi.org/10.4135/9781452226651

Schreier, M. 2012 *Qualitative Content Analysis in Practice*, London: SAGE Publications Ltd.

Schreier, M. 2013 'Qualitative content analysis' in U. Flick (ed) *The SAGE Handbook of Qualitative Data Analysis*, London: SAGE Publications, Inc. 170-83. https://doi.org/10.4135/9781446282243.n12

Shen, B. and Bissell, K. 2013 'Social media, social me: a content analysis of beauty companies' use of Facebook in marketing and branding', *Journal of Promotion Management* **19**(5), 629-51. https://doi.org/10.1080/10496491.2013.829160

Sheridan, A. 2016 'Unearthing the secrets of East Anglia's Bronze Age settlers', *Apollo: The International Art Magazine.* https://www.apollo-magazine.com/unearthing-the-secrets-of-east-anglias-bronze-age-settlers/ [Last accessed: 26 June 2018].

Southport Group 2011 *Realising the Benefits of Planning-Led Investigation in the Historic Environment: A Framework for Delivery*. https://www.archaeologists.net/sites/default/files/SouthportreportA4.pdf [Last accessed: 29 May 2018].

Spiliopoulou, A., Mahony, S., Routsis, V. and Kamposiori, C. 2014 'Cultural institutions in the digital age: British Museum's use of Facebook Insights', *Participations: Journal of Audience and Reception Studies* **11**(1), 286-303.

The Daily Mash 2016a *Bronze Age village was furious about Iron Age migrants*. http://www.thedailymash.co.uk/news/environment/bronze-age-village-was-furious-about-iron-age-migrants-20160113105279 [Last accessed: 26 June 2018].

The Daily Mash 2016b *Bronze Age families 'lived like middle class twats'*. http://www.thedailymash.co.uk/news/environment/bronze-age-families-lived-like-middle-class-twats-20160219106423 [Last accessed: 26 June 2018].

Thorbecke, C. 2016 *Remarkable 3,000-Year-Old Community Dubbed the 'British Pompeii'*. https://abcnews.go.com/International/remarkable-3000-year-community-dubbed-british-pompeii/story?id=40764968 [Last accessed: 17 July 2018].

Tong, J., Evans, S., Williams, H., Edwards, N. and Robinson, G. 2015 'Vlog to death: Project Eliseg's video-blogging', *Internet Archaeology* **39**. http://doi.org/10.11141/ia.39.3

Wakefield, C. forthcoming 'Engaging a wider audience' in M. Knight, D. Gibson, R. Ballantyne and I. Robinson Zeki (eds) *The Must Farm Pile-Dwelling Settlement (Volume One - Interpretation)*, Cambridge: McDonald Institute for Archaeological Research.

Walker, D. 2014a 'Decentering the discipline? Archaeology, museums and social media', *Online Journal in Public Archaeology* Special Volume **1**, 77-102. https://doi.org/10.23914/ap.v4i2.61

Walker, D. 2014b 'Antisocial media in archaeology?', *Archaeological Dialogues* **21**(2), 217-35. https://doi.org/10.1017/S1380203814000221

Waters, R.D. and Jamal, J.Y. 2011 'Tweet, tweet, tweet: a content analysis of nonprofit organizations' Twitter updates', *Public Relations Review* **37**(3), 321-24. https://doi.org/10.1016/j.pubrev.2011.03.002

Waugh, R. 2011 'Boats from the Bronze Age: 3,000 year-old site reveals how early Brits took to the water', *The Daily Mail*. http://www.dailymail.co.uk/sciencetech/article-2072119/Bronze-Age-site-offers-complete-picture-life-East-Anglia-3-000-years-ago--skilled-sailors-used-cutlery.html [Last accessed: 11 June 2018].

Wilkins, B. 2019 'A theory of change and evaluative framework for measuring the social impact of public participation in archaeology', *European Journal of Post-Classical Archaeologies* **9**, 77-100.

Zimmerman, L. 2018 'Changing archaeology's "brand" would be helpful', *Antiquity* **92**(362), 523-24. https://doi.org/10.15184/aqy.2018.16

Zorzin, N. 2016 'New managerial strategies in British commercial archaeology' in P. Aparicio Resco (ed) *Archaeology and Neoliberalism*, Spain: JAS Arqueologia. 297-325.