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Panelists:

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Moderator:

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ALE: Thanks for waiting, everyone, and thank you for joining us for this Arches webinar featuring a demonstration of the Greater London Historic Environment Record (GLHER) online. My name is Annabel Lee Enriquez and I'm an Arches Project team member at the Getty Conservation Institute and today's moderator. Presenting is Stuart Cakebread, the manager of the Greater London Historic Environmental Record at Historic England. And during the Q&A session, we will be joined by his Historic England colleagues, Andy Jones and Philip Carlisle. Some housekeeping notes: if you have a question at any point, feel free to enter your question into the Q&A interface. The chat function is disabled, so please do use the Q&A interface for your questions. If someone has asked the question that you also want to know the answer to, you can upvote a question and we'll prioritize those. This webinar offers live captioning which you can enable by pushing the live transcript button on the bottom menu. The webinar is currently being recorded and we will make the recording available within a week and you will be notified of this if you follow us on X, formerly known as Twitter, Facebook or LinkedIn, if you are a member of the Community Forum or have subscribed to our mailing list. And so before I hand this over to Stuart, I did want to acknowledge that Historic England has contributed to the Arches project since its inception over a decade ago. Out of this relationship, the Getty Conservation Institute, Historic England and the City of Lincoln in England decided to collaborate to implement Arches, initially for Lincoln and then for Greater London as vehicles for producing what we are calling Arches for HERs. This is essentially an Arches package customized for use by Historic environment records within England and perhaps as a starting point for those who do similar work elsewhere in the UK and around the world. So thank you to the Lincoln and Historic England teams for working with us to bring much of what you are about to see to fruition. And with that, Stuart please unmute yourself and take it away.

SC: Right. Thank you very much, Annabel. I can see my PowerPoint here, OK right. Thank you, everyone, for joining us and I'm Stuart Cakebread. It's my pleasure to be the London HER manager for

the last 17 years. Before I start showing some of the features of Arches for HERs, I thought I'd give you a brief overview of Historic Environment Records and the project for those who don't know much about HER or our project. So what is an HER, a Historic Environment Record? Well, they've been around for over 50 years now. Used to be called Sites and Monuments Records. Historical records provide detailed information about the historic environment of a given area for a range of different uses, that might be planning land management work or research. And basically, they're a record of human interaction with our surroundings from earliest times, right up to now. We put in information from a wide range of sources and effectively we're a signpost to primary sources of information. We use a range of standards and guidelines and wordlists, which have evolved over time to ensure data integrity and consistency of recording. Now, most HERs are managed by local government authorities, county councils, district councils, unit trees, who responsibilities within the planning system. And as a result, they're usually housed within planning teams within their parent organization. Now between us English HERs hold nearly 4 million records on the historic environment in England. As I say, most managed are by local authorities. London is not. And London is unique. Since 1991, it's been maintained, along with most of the ecological planning advice for London by Historic England, the UK government's advisor on England's historic environment and who also have a role overseeing HERs in England. As I say, the HER covers all the London boroughs, all 31 of them, including the cities of Westminster and London, plus a couple of planning authorities. But my archaeological advisory colleagues, they cover all London save Southwark who have their own in-house advisor. There's 5 advisors and they share up the whole of the 32 boroughs between them. As I said, HER has been around for over half a century. Their origins lay at the Map and Carding index recording system originally used by the Ordnance Survey. Over time, they become increasingly more computerized so that today they're held in sophisticated databases and associated mapping systems, GIS. In England and Scotland, most use a system called HBSMR, which has its origins in the late 1990s set up on behalf of Historic England, then English Heritage and ALGAO, the Association of Local Government Archaeological Officers. But there's also HEROS, which is another open source heritage system, which is used by the Welsh HERs. There's Arches for HERs of course. There's also a number that use their own in-house bespoke systems.

Why Arches for HERs? Well, the main things which attracted us to Arches was that being open source, there was no license fees or restrictions on the number of users. For a number of years now, the UK government has advocated the use of open source software. Its use is considered a good practice by the government. For example QGIS is now used by a growing number of local authorities and HERs around the country. So Arches neatly ties in with its guidance. It's also web-based so I'm not restricted to using old HE systems and laptops alone. and also it's customizable. As a local administrator, I can make changes to the system which I was not previously able to do or which took time due to our internal IT processes. Now, I'm obviously not talking about major alterations in the data structure of Arches for HERs that would cause data compatibility issues. But I have the ability to set a user up in 5 minutes to start using Arches now rather than a week or 4 weeks with our internal IT systems as used to be. I have

control not only over the resource models or record groups users have access to but the data in the records, what mapping they can see, whether they can edit or download data. This means that not only do GLAAS, that's the Archaeological Advisors and support teams, have access to the HER. That's about 14 people. But I'm now setting up all the London management teams who mainly deal with the built heritage with user accounts. Previously, they had no access to our system, and that did lead to a few unfortunate planning situations. So that's another 23 users I'll be adding. Also, we no longer have to be so careful about managing our licenses, with how many volunteers we have or when they come into the office or when we get HER visitors coming in, or how many licenses we need when we have heritage contractors working for us. Plus, for the first-time external users can view the HER being updated in real time. For example, our commercial users can check data and begin to assess projects before contacting us for data. And hopefully this means that we will not get unrealistic search areas such as people asking for a kilometer radius search in the city of London. They're being horrified when we start to try and charge them thousands of pounds because the thousands of records they want, rather than asking for 150 meter radius, which only comes up with like a 20 or 30.

As I said, not only can I control access to the data and the mapping and what type of records they can see, which is useful, but our external archaeological advisor in Southwark now has access to the system. He can view it rather than us having to package up the data periodically and send it to him, which takes time. But also, I can give access to the London borough conservation officers who deal with built planning cases. But it's not just access I can give to them, to these external users; with the Arches users account, hopefully we can get in the future them to actually supply information to us directly, particularly local listings, local buildings of local importance. If they're doing upgrades or new surveys; and that'll be fed directly into the HER so reducing the amount of time data has to be added or migrated by ourselves. Also, the projects we set up with external contractors, they'll be able to directly at the results straight into the HER. So there's no need for them to have to come into the office, which adds to training costs, adds to the project costs of us having to do this. Obviously, we still need to monitor their work and that's where the provisional editor of user set up is great because they can add that data straight away, but it's not visible to outside people, and we can sanction and approve it as we go along, possibly even in the future, maybe if we can try and get our contractors to start adding activity and source records as well.

Currently we have 65 users set up with active accounts with 3 different levels of access to Arches. 20 of those are external users testing our system. We could never afford this level of interactive access before. Also, we have 5 volunteers at the moment. Once we launch next year, we plan to increase our engagement with the London universities and local heritage groups. If we can double the number of current volunteers this would potentially be the equivalent of gaining an additional HER officer, something that would be great because we have restrictions on the number of staff we can have Historic England, but in financial terms with office and staff overheads this would be the equivalent of 50,000 pounds a year additional support we would get. So by using Arches for HERs, not only can we show alignment with the

government's policy on open source, but also demonstrates the government and our laws and masters public value for money as well.

Now the system is intuitive, easy to use. That's what the website says. And we've had lots of public positive feedback from internal users migrating to the system on how easy to pick up the system and use it. But that's also been backed up by our external users new to the system. Some of them viewed a presentation I gave at the Charter Institute for Archaeologists London branch meeting a while back and there was a lot of enthusiasm for using the system. We also liked the ethos that users can share the benefits of their work, the work that HE is doing for Arches for HER gets loaded up onto our GitHub website and is accessible for any others to use and vice versa. And I'll touch on that again later. Now, we've been working on this project for a while now. As Annabel said, our project, our colleagues in Lincoln launched ARCADE. This was the first English HER to use Arches, and this was a test case to see the potential of Arches as the Lincoln system is much smaller and simpler data set than the London record. Since then, we've basically taken Arches and put it back together. We've talked a lot in the team and with developers, but also with others outside of HE, Historic England, with an interest in historic environment records about how to build Arches for HER and what to include in it. We've now been using our version of Arches for HERs for over a year now, about 16 months, and Lincoln began using theirs earlier this year. We have another HER in the process of migrating from our old system to Arches and another one looking at migrating as well. Internally, my IT colleagues, Andy Jones's team, and others are not only working on Arches HER for London but they've been working all Arches internally. We have Warden, which is recording our land based national heritage data but also maritime archaeology Mariner, which they're currently working on now. And so Arches for HER. Unfortunately, I don't have time to show all the features we working on, but if there are any in the audience who want to find out more about Arches for HERs or are interested in HERs or the work of HERs, we will be giving a presentation at the Winter Forum meeting in York on the 12th of December. Alternatively, we'd be very happy to give a demonstration and discuss a project with people or organizations. We've already given demonstrations to a number of HERs now, as well as UK National Historic Environment bodies and including one natural environment body, which was quite exciting.

So I'm going to just pick three things that we've been working on, which I hope will be of interest generally to Arches users. Now, one of the things we first, it was review the resource models in Arches. Those familiar with HER data will recognize the main data groups we have added Arches for HERs, but talking to colleagues, we decided to further expand these to give us the potential to add more information relevant to a particular record, such as maritime vessels and aircraft. For example for now, I'm going to concentrate on two resource models: application areas and consultations. Now these relate to heritage planning casework, which my archaeological advisors carry out. But these and workflows I'm going to show, I think could also be used for land management, probably project management, and maybe a financial case management as well. So after much discussion with our advisors, it's decided to add all the

data related to their case work into a consultation record as we've done before, to split the information into two parts. Now, there's two halves, the application area. Now, this comes information on the site: where the site is located, associated heritage, any associated heritage designations which might have implications for any planning cases that's taking place on the site. And then the consultation, the cons, which covers information about what is being done to site: the planning application, what condition our advisors is placed on it, and the management of the casework officer's case. Our advisors felt this was a better way to manage particularly complex cases. Most of the cases will be one area, one site, one case. But in London they're often very large infrastructure projects such as Crossrail 2, you may have heard of. We had Battersea Channel, multiple residential developments. There's the development of the former Battersea Power Station. Older listeners may recognize that Pink Floyd album and also the new US embassy, with multiple planning applications having over a long period of time. So we asked our developers to create workflows, which would help users add information to these two systems, but also try help them ensure greater accuracy and to pick the workflows up as quickly as possible. And this is what they came up with.

So just let that start - so you can see up the top here, we have two new tabs, active and new. Now I'll talk about active in a bit, but that's for tracking live casework. New: This is where our new workflows sit for application areas and consultations. And these - will be used by our business support record offices to initially create application areas and initial consultation records, which would then be picked up by our archaeological advisors. As you can see, we've got 5 workflows. Here, too, related to the resource models on the left, the 3 on the right. These are for the casework offices, the archaeological advisors, and they will use them as part of their management of their casework. They say the application area and the initial consultation record will be created by our business support team who don't have a lot of archaeological experience. So as you can see here, there's various tabs you need to work through. Now, as I said before, we wanted to try and ensure accuracy as much as possible. So one of the things I can do is a local administrator is I can go to the cards which feed into this workflow and I can set the application area: textbooks. So the users have to add something before they can move on. They have to add a name. And this is particularly useful because we've had problems in the past with people not adding names of boroughs or dates for cases which can have quite a dramatic effect with or implications for case works and completing them in due time.

Now, next, we can add some description to our record here. As I say, this is all about recording the site. The next thing on here is once I've added the description, I can spatially represent the site. Now, as you know, Arches uses using longitude and latitude as part of its mapping system. We in the UK prefer to use our own system, the British National Grid, eastings and northings. So what we're trying to do is ensure as much local coordinate system compatibility as possible. Although I have to say that we've done 700 data requests so far in 16 months. And I think only one person has queried us supplying the data in longitude and latitude. So I'm looking for my site. It's the old Halls Depot off Market Lane. Now I'm just going to add

a polygon here, I can drag and drop a json html file, but I'm going to do it old school way because we like to keep it simple. I don't need to worry too much about the accuracy here because we just want a representation. I've given up trying to get our archaeological advisors to map anything accurately or too accurately. Now I can add information about the shape, but as I say, one of the things we've got here is, as I say, we use BNG. So if I go to the edit coordinates, you can see I can change the coordinates using the easting, northing according to the British National Grid, we can do it in longitude and latitude. Let's say we get most of our information using our local coordinates system. And this is just one of the things that we've done to try and add some local flavor to the record.

Now, I'm happy with that. I'm going to save that I'm going to move on to associated heritage on the site. Now, I can at least by searching for sites and putting them in. However, what we'd like to do in future is take that spatial mapping that we've just done and get Arches to go away and pick the monuments or artifacts areas associated with that. And put it up in a drop list, which I can then pick from. This has been done on another non heritage related Arches project. So famous last words, shouldn't be too much of a stretch for a future versions of Arches. It's a couple of sites here that I know related to this site, so I'm happy with that, I'm going to move on to add the description. Once I've given a bit of an area description, the last thing that I'll do is add information about associated designations, heritage designations which will have an impact, or the proposed work that our developer wants to take place on this site. Very often this will be national designation, such as listed buildings or schedule monuments, but also more local designation such as conservation areas. So if we're doing building works, that has an impact on what work can be done for the building in this case, I know that it's in one of our archaeological priority areas Croyden Down. So I'm just going to add that here because say we want to add as much information as we can in one place and this is designed to help the archaeological advisor make their decision on what needs to take place on this site. I know it's a tier 2, so it is of significance. So when the advisor comes to see this, you can look at the type of work that's been proposed. When we come to do the consultation and we know that there's a medium risk to the heritage. So they will factor that in when they come to the decision making process. I can add a link to the APA record there or if there's any digital files, site photos, for examples, I can add that. And I can keep adding more designations if they're relevant. Finally, we can then review the information we've added just to check it's okay. Obviously, you can see down the bottom here, we can go back to previous steps or we can actually go into the record and look at it. I look at that and yep, that all seems to be okay there. No spelling mistakes, so that's good for me. And we can save that. And we can move on to our next thing.

Now, a consultation. Though we created our application area we need to link that to a consultation. Now there's two ways we can do this. We can do this spatially by using the application area layer here and linking spatially. Alternatively we can add the name and link it that way. And that's important because we do need that functionality for accessibility reasons in the Greater London Archaeology Advisory Service. So here. I just adding the names of Market Lane. That's fine. I'm just going to type in the name or the post

code just to check I've got the right record. Let's go there. Let's go past the memorial grounds. Yeah, there's halls near the railway. Yeah, that's fine. uh, let's say the polygon looks a bit ropey. Add it to the map. But yeah, that's, that's fine. I'm happy with that. I can add some more information about the location description if I want to, but I think I'm happy with that. So I'm going to save and close that and move on to the next step. Now, as I said, consultation dates are really important. We have 21 days to respond to planning applications. So this is why it's vital that this information has to be added. I spent many hours previously every month searching for log dates, to then have to send emails to advisors, saying please, can you fill this in because otherwise, it's not going to get factored into our stats. I no longer have to do that. So that's brilliant. Next we are going to be adding information about the consultation type. And I say this is all information that for us is being added by our business support team, the archaeological advisor, casework officer doesn't need to do this yet. But it is important because this is all going to be part of the consultation. But will also feed into the condition letter that we're going to be sending back to the borough who've got in contact with us about this planning application. Now next, reference numbers, all the planning applications have planning references, which we need to add now. Another little feature I can add is a local administrator. You can see the reference type there automatically comes up with planning reference. That's because most of the references we add are planning references. So to save a bit of time, I can send back card to show that saves a little bit of time for people when they're adding more information. And our business support offices are always very keen to save as much time as they can when they're adding information. So Croyden record. I can also add further references. We have our own internal reference system, so change that to system reference for class. But you can add further references as the case work continues. There might be a project number from the archaeological contractors that you want to add there as well. Next, once I've done that, I want to add what the proposal is. I can either type the same as I'm doing here, or depending on how we get the information from the London borough, we can just cut and paste that in here. And then after that we'll add the contact details. Now, these are important because they show whose doing the work, whose case work that is, who we're responding to, who the developer is, who the owner might be. Because this is where our letter is going to go to. Our correspondent say this is the our decision or the site, it might be that no further work is required or it might be that we decide that further work is required So I'm just putting that in here now and it's really important we record as much information as we can on the record.

Now, I'm going to add the planning officer here. So this is old Charlie from Croyden. He sent us application for our consideration. He's the person we're going to be sending the letter back to. So we need to know who to send our letter to. And he's Croyden, most important borough, London We're setting him as the contact officer. I'll put in the casework officer as myself, because that's who the letter is going to come from. And then I had agent, owner or applicant if required. Once I'm happy with that, I'll save and close that. And as before, with the application area, I could just review that information. Make sure it's OK. And once I'm happy with that, I'll go away and save that. And that's saved that record. Now I just show you the branches in the consultation record. Now, obviously, what we've done there isn't the full record.

That's enough for the advisor to get cracking and starting on their work. What they then need to do using the information they got from the borough and the application area is make an assessment of the significance of a site based on heritage on the site and heritage designations impact on the site. And then give their advice on what actions, say maybe no further work required. Or it might be that we need a program of trial trenching to evaluate the site. Once they've done that, they can then create their correspondence record. This is the letter that gets sent out. So what we do is we link the consultation here, as you can see, we have a number of set template letters based on conditions. The advisor picks that case, hits OK button, and then Arches generates a letter. And here, write to blank out some of the information because this is a live record, but you can see it's been pulling information from the consultation record, but not only has it produced a letter, which can be then sent on to the borough, it automatically saves that to the consultation record that one of the things we're very keen on is having as much information as we can within that consultation record. In the past, information gets stored by the individual advisor in emails, might be brief notes in the consultation and that makes it very difficult. If somebody is off sick and somebody has to step in or take over a new borough or even come back to a casework afterwards. So we're trying to get as much information as we can related to the record and the correspondence gets added to our communication section of the consultation record.

Now we can add other the communications here, emails, faxes, telephone calls. Um, let's have an example here. Location of trenches. We've agreed a programme of trial trenching the archaeological team on the site has come back, said land is contaminated. We can't put the trenches where you said, we want to add new places. We sent you a map of where they are. I can record my conversation I've had with them. Yeah, that's OK. I'm happy with that, I can then set any follow up actions - I'm going come out next week and have a look at these trenches and I can upload the map. They sent the revised translocations and again, once I'm happy, save. And that gets added to the consultation record. So last on site visits, I could go to the site, I can have the meeting, I upload my consultation again. I can put information about the visit. Describe the location. Yeah, heavily contaminated. I can then add information about who was on the site, what observations are made- those trenches in the right locations. Recommendations - yeah, maybe 1 or 2 need to be extended. I'll come back again in another week and check on them and also add site photographs as well. And here's a real example that my colleague Sandy created. As you can see, we've got information about the site description, who attended observations, what recommendations and photographs on the site. And this is really important because this means that all the information is in one place. So when our advisors go on site we can have certain clients who are rather tricky. Let's leave as that. But now advisors can go on site, say no, here you go. They could get out their laptop or their tablet or phone, say, know this is what was agreed, black and white. This is what we've got. These are the photographs proving it. So that's a real bonus for our advisors.

Lastly, activity. This is what we can keep track of our live cases. It works on the traffic light system. Green: You've got loads of time to look at your case. Yellow, amber: you've got a week to make a decision. Red: It's overdue and the advisors can keep track of this themselves. They could do it by borough or type of work. My boss can keep track of this and this actually saves me, as I said before, having to contact all the individual advisors, do some research and say, please, can you update your records? The other thing that we've done is we have monthly stats in the past. It's taken me 3, 4 hours every month running queries, checking to make sure that people are feeling things properly, filling the down again. Now we've got it linked to Power BI. I can do it 5 minutes. All the information I require is at my fingertips. I can send people this or just add to a spreadsheet. And in future, we're looking at seeing if we can add HER recommendations. But we'd also like to think about whether we can do it for the HER audit or the Historic England annual survey. So that's the workflow process I wanted to talk about.

Another thing that we were working on, which probably, hopefully for other people, we have new regulations in the UK the last few years about public sector organizations having a legal duty to make websites, apps make accessible requirements. Much of that is something that other people outside England or the UK also need to consider. In 2019, HE commissioned a report to look Arches and the report that came back on Arches - we've used that working with Farallon Geographics closely to make Arches for HERs as accessible as possible. Some of the things that we've done: enabling zooming up to 300 percent without spilling off the screen; that works fine with a mobile phone. As you can see, I have actually gone outside, used it myself, , allowing users to navigate most of the website, using just keyboard. You can see highlights over tabs here. Also allowing users to listen to most of the website using a screen reader, including JAWS or NVDA voiceover and we're just started to look at Dragon. Not just looking at text to voice, but voice to text, because that's something we need in GLAAS as well. Now, all of this is being or will be loaded onto the Historic England GitHub site for downloading, once it goes into Arches for HERs, it will go into core Arches as well. I think v7.5 we're aiming at. But this won't be the end of the accessibility work that we we're doing. We're refining our guidance in terms that goes on to Arches for HERs as well. And we're going to try and continue to make Arches as accessible as possible.

Now I'm running out of time. So I won't do live demo with this. I'll just do some screenshots But as I said, Arches is great. I can get users set up very quickly and creating spatial features with very little training in just a few minutes. However, as an HER we do require some levels to create more detailed mapping, spatial mapping. And also there's layers that we may not necessarily want to have on Arches. So we ask our developers to come up with a link between Arches and GIS. Um, we're an esri organization. So that's what we asked for. And that's what we got. So the Arches esri link or Arches esri add on connects Arches to ArcGIS Pro allowing direct access either way for creating spatial data. Currently it's up to version 2.9. I should say that this doesn't come out of the box, it does need some configuration to get the mapping in and working. And this is something that if you're interested in, I'm sure my colleague Andy Jones can tell you more about. Um, we've had a lot of interest in this. And also, particularly in a QGIS version of this, I'd

love to see a WGIC version of this. So as you can see, we have a new tab up here called Arches Projects. If I click on that, that brings up another little window for Arches connection and editing resources or creating new resources. If - general tabs that I can use. So what I do is I linked my server, add my user details, make sure I don't show anybody online my password as I've done before, and then connect to the Arches. Hopefully in future versions we'll look at seeing if we can get rid of that and have it so that once you've logged into Arches, it does this automatically. Now, using my working layer, I create my special feature or features. I select that. Then I decide what resource model type I want. In this case, I'm going to create a monument. I don't want to load that geometry up into Arches. Arches will say, do you want to do this? And I'll say yes. So Arches will go away. It will create a new blank Arches record and populate the spatial record into that. When it's done, it will give me a hexadecimal number here. I mean, if I want to add further information to that record in Arches, I can click on the resource editor and it will pull up the record into the chrome paint into Pro. I can add the information here. If I want to I could pull it out, put it into another browser window because we use two screens. Um, but given our old GIS system, that we don't see a lot of - in fact, it is slightly quicker than our old GIS system. That's nothing to do with our old HER system. That's entirely Citrix thing which used to take a while. So this is slightly quicker. Um, I think I'll start slowly lose my voice. So you'll be very pleased to hear that I'm going to stop talking now. I could talk and talk and talk, but obviously if you'd like to find out more about this, please give me, Phil and Andy a shout. I'll hand back to you Annabel.

ALE: Thank you Stuart that was a great presentation. You really covered a lot of the great features of GLHER online. So I'm going to ask Andy and Phil to unmute themselves and to join us for the Q&A. And I'm going to ask if before we launch into the questions, if there's anything that you all would like to add.

AJ: I think Stu did a very good job with doing that. Well done. I mean, it's just to say we have been doing a lot of work on it. Certainly areas around accessibility and improving those areas of working on ArcGIS Pro. There's been a lot of work. Obviously we're still not there on all of it. As Stuart was saying, we're continuing to improve it and work on that and hopefully for the benefit of everyone else who's going to use in the future.

PC: Yeah, just to second that, about Stu doing a grand job. Well done Stu.

ALE: OK, great. So we already have some questions and some upvoting, and so I'll just launch into them. So the first question is from Jonathan Robinson and he asks, "What would be required to initiate a QGIS/QGIS Server/GeoServer version - has this been done for other implementations of Arches?"

SC: As far as I'm aware, it's something that we started to talk about. I know that Farallon are very interested in this. I would be, I love QGIS, I think it's great. And it's open source. So goes with the Arches

and government ethos on open source software. Um, we will hopefully start discussing this with the Arches UK user group and see if we can get some ideas there as well. Phil?

PC: Yeah, I was talking to Phil Weir from Flax & Teal about this in Belfast two weeks ago now. And yeah, he started looking at how to get this going. So Phil's quite keen on using QGIS because it fits with Flax & Teal's open source ethos. So yeah, hopefully, he'll be able to talk about that at the User group, right.

ALE: Yeah. And I think that'd be a good time to mention that this is one of the beauties of Arches being an open source software platform. Flax & Teal is an Arches service provider that is not currently working with the Historic England, they're working on their own. And this is something as part of the Arches community: any developer, any organization can initiate development to add functionality to the Arches platform.

SC: I think Flax & Teal are working with Northern Ireland heritage services, looking to transfer that their site support structure to Arches?

ALE: OK, all right. So we answered that. Next question. And again, if there is a question that has been entered into the Q&A panel that you would like to upvote, please do that so that I know what questions I should prioritize. "Are there mechanisms to do bulk data uploads to GLHER/Arches for HERs e.g. from community groups or external projects?"

AJ: Yes, there's been a lot of work, I know behind the scenes in terms of like bulk upload of data. So there is a mechanism that's being built in to allow people to customize or create custom flows of delivering data into the system. I'm not sure with what the current status really is, whether it's due to come out- I know it is in some of the current versions, you can enable it and start using it. But I know certainly there is a mechanism in there. I think there is an element of kind of developer or certainly some kind of technical skills required for it. I think there is an element of developer or technical knowledge required for it - it does come out of the box with some kind of default modes, but we're certainly going to be looking at that for kind of the future Arches for HERs and also for MARINER, just in ways we can use it to kind of manage data coming in and out of the system.

ALE: Thank you, Andy. And just as a note, there are multiple mechanisms to do bulk data uploads in to Arches at this point. And initially, we had csv upload and now we have different kinds of csv uploads and we had shapefile upload and different kinds of uploads. And now we have the ability to upload data directly into the underlying Arches database, the PostGIS database. So there are many ways to do this. All right, next question. "What are future hopes and plans for Arches - bearing in mind the majority of HERs currently use HBSMR?"

SC: Well, but basically, we're trying to provide another option. We don't want to dominate the whole scene. We're just providing people with another option, which given the way that technology has gone, I think potentially would be a benefit to many HERs, I mean, it may not be all HERs, some of them for various reasons, perfectly good reasons are quite happy with their own system, whatever that system may be. Um, but we would certainly like, well, we have got other HERs moving onto the system. I think it's just healthy competition really. There are future things that we would like to bring to Arches uh but I won't say too much more about that at the moment, I'll save some of that for the HER forum meeting. Andy Phil anything you want to add to that?

PC: The only thing I would say is the flexibility and the semantic nature of the graph database is a future proof benefit really. That's why we're sort of using it more internally now, to replace the old database, which was a burning platform. So that's why we had to quickly move over and create WARDEN.

ALE: And just to add to that, I think there was also a question about why wasn't this done for WARDEN? So I believe that question has been answered? But I will add just generally regarding the Arches platform the future hopes and plans for Arches; at the Arches Project, we are making provisions for the long term governance of the open source community so that there is some longevity not only for the data that you hold in Arches that you all manage. But also for the software itself and the software community, so that's something that is currently being planned for.

SC: Also Annabel, at Historic England, we're also looking at how we can support Arches for HERs going forward. It's very early days yet. There's been no decisions made yet. But yeah, that's something that how we see how we can do that. And I believe that HE is also involved with the governance board as well.

ALE: That's right. They are OK, great. So our next question, "How easy is it to use and implement PowerBI with Arches? Could you please show where you access PowerBI reports from Arches?"

SC: That's a very good question, I'm glad somebody asked those. I have to say one of our developers has done that for us. It's one of those things. So what I've learnt how to do it all. I'll tell you how to do it. I don't think it should be too difficult. Andy can shoot me down for it what I've just said—

AJ: Yeah. We've just built, it's a relatively simple PowerBI dashboard just to kind of cover a few of those, those sort of metrics we are using, it is directly connected to the database. So it is separate. It's not part of Arches, but we use the audit log table, which captures the order of all the work that's happening and allows us and gives us the information that we need to generate those statistics. So I guess if you're a user of PowerBI and you are able to connect into that audit log table, then you should be able to generate those. I think there are a couple of additional ones that we have, some enhancers that we've done where we are querying some of the information out of Elasticsearch as well. So that that is a slightly more

advanced part of that thing to do with some of the some of the targets, the 21-day targets. But the rest of it is coming out of the audit log.

SC: Yeah. I spent a couple of months time..

ALE: All right. Next question there. This is from Jonathan Robinson, "What sort of costs are likely to be associated with implementation (for e.g. do Lincolnshire have some analysis as a smaller HER) for a non HBSMR HER? What sort of technical staff would be required?"

SC: Cost wise, Andy can do the more technical side, that's a very good question. It's something that we've been desperately trying to calculate ourselves as part of the project because we knew this is something that is very pertinent to people wanting to move to Arches. Unfortunately, the way that we developed the system by breaking it, putting it back together, its been very difficult for ourselves to do that. And I would say probably the way that the Lincoln system went together, again, not necessarily going to give you a true reflection of the costs, although they were using a bespoke system. Um, we are with HER that's moving to Arches at the moment. Um, we are in contact with them. We are giving a bit of advice and we are looking at trying to keep a record of what they've done and their costs. So once they go live, we should have to get a better indication of what the costs should be. Um, I do think, though, that from what my experience so far of the system is that even if there are perhaps costs to begin with, um, as I say, with the ability to engage with many more volunteers that we could do in the past, there is long term cost benefits, which outweigh any that initial cost to begin with.

ALE: Andy is there anything that you'd like to add to that?

AJ: So I think just looking at the kind of the technical staff required for setting up it, there is an element of sort of technical skill that you need to have, be that you're an internal team that they might already have or maybe getting a provider to come in and help. I think it's safe to say that there's a need for developer support certainly at the moment to kind of get it stood up and do some of the customizations that you want some of the some of the report templates and some of the workflows need a little bit of customization. So there is an element of additional kind of technical skills you may need to support you standing that up. Obviously, we're fortunate to have an in-house team that has been able to do this.

ALE: I'll just add generally Arches and Arches for HERs and any other Arches implementations - the kinds of costs that are associated have to do with implementing your Arches system on a server and then having the technical, as Andy mentioned, having the technical expertise to implement Arches. And most of the time those costs are at the beginning of an implementation as you are setting it up. Fortunately, in this case or for anyone who is in any organization that has HER in England, a lot of this work has been done for you by Lincoln and Historic England.

So not a lot of not a lot of customization will be as required. But for others, if you do have customization, that's something that you should consider resourcing. And if you do need technical expertise and do not have that in-house expertise, on our website, we have a list of Arches service providers. We had just mentioned Flax & Teal, they're a UK based one and others. So if you go check out that the listing on our website, you can see what other service providers there are. OK, next question: "Where are other instances hosted - on premises or cloud based?" Andy or Stu?

AJ: Um Yeah. So all our systems are hosted in Azure at the moment. So it's kind of a fairly standard installation. I mean, we're slightly unusual in that we run ours on top of Windows VMs and I know a lot of people use it for that, we're also planning in the future to try and implement that in more of a cloud platform kind of way without going into too much detail on it. So we're trying to slowly evolve that. But we host it in Azure. Yes, I think that if there's anything else to kind of cover there.

ALE: Next question, "Does Arches for HERs/GLHER support publication to the Heritage Gateway at present?"

AJ: So Arches out of the box doesn't. But we have an additional component that does publish information from both Warden and Keystone onto the Heritage Gateway. So that is there. We haven't made that available at the moment, I think, because we're still working out what the long-term goal is. And I think when we move forward, it may well be that we do look to make that available. But that is built at the moment using dot net rather than the standard Arches framework. So we may look to change it so that we support something that's a little bit more integrated into Arches in the long term. But I know there's work happening around the Heritage Gateway and the future of gateway. So we obviously, we want to see how that how that progresses as well before we make a decision.

ALE: All right. Next question, "What is the long-term stability of the software behind Arches? Most website platforms release updates every few years and some require almost complete rewrites of the platform. long term maintenance." I can answer this as a member of the Arches team at the GCI. I mentioned our governance initiative which is basically planning for the long-term stability of the software of the open-source software and community. Again, one of the beauties of having open-source software is that it's not about making unilateral decisions about the software and whether or not it's profitable or not. It's really community focused and governed governance of the software. And currently with the Arches software we're making updates definitely more than every few years. We're making them quite a bit. And definitely keeping an eye on making sure that that we're not making any major changes that aren't warranted. So, and that really benefits the community. I don't know if anyone else wants to add anything about that.

AJ: I think Arches is well-maintained at the moment. And like you said, the changes that are being made are, you know making sure, that all the backend software and the dependencies are current and secure.

So that that is ongoing and as you said, any sort of major changes are being done because they need to be done to maintain security and currentness.

ALE: All right, Richard Hughes asks – I know that we are at a time that we can answer a few more questions before we wrap up – “Would it be possible to store a HBIM 'model' fully with Arches?”

PC: I would say at the moment, no, because we don't have a model for it. But we could - yeah, we could easily build a model for HBIM. So yes it would be possible, as it stands out with Arches for HERs doesn't have the model, the resource model at present.

ALE: But to Phil's point, it is very easy to if you want, if there is a data type or some kind of digital object that you want to store within Arches, that's something that as Phil mentioned, build a model for and then you can store it. Now, viewing is a whole different animal. But you can fully store most digital file types as long as you provide for that. OK, next question, Rob Gaston, “How can folks stay up-to-date on the latest happenings with Arches-HER? are the UK user group meetings open to new attendees interested in following the project? (thanks for a great talk!)”

SC: Yes, we're still in our infancy with the UK Arches User Group. We're having them periodically. But yeah, people if you are interested in that drop me a line. And I can add you to the user list. The dates of our meeting go up on the Arches main website. Yeah, just, just ask me. I'm the chair now myself, anybody interested. Let me know.

ALE: Yeah. And if you are interested in additional information on the UK User group, we always post information about meetings upcoming on social media and on the Arches Community Forum. And there's also a webpage on our website that has information about that.

SC: There's also the US User group as well, they do some interesting things as well.

ALE: That's right. And if you are interested in attending the US User group meeting, that's actually tomorrow at 12:00 pm US Pacific Time. And that's open to – it's US based that is open to everyone. If you're interested in seeing what US users are doing with Arches. OK and, “Comment not question: Great demo Stuart! Interesting to see how it works on the archaeological planning advice/consultation side. Look forward to see your demo at HER Forum later this year.”

Stu: Thanks Ben.

ALE: From Serena Cant, “If this report came out in 2019, and influenced the building of the GLHER, why wasn't tab and keyboard functionality built into Warden?” And I believe this is the report on accessibility that Serena is referring to. I think.

PC: The reason was that Warden had to be built very quickly to get the data out of the Oracle database. Because we had an issue where an Oracle database had failed and we lost all the data So it had to be quick and dirty to get the data in there. Warden is now in the process of being upgraded. And so the accessibility work that has been developed for GLHER is now being fed into Warden. So that is coming. Yes, it's been a while, but we've had to work on various things. And actually getting accessibility into core Arches has been one of the main drivers for the development of GLHER as it is. And being able to feed those changes into future versions, including Warden and Wariner.

ALE: Thank you Phil. Last question and then we'll close after this question, "Is customizer ability being tried with other options where there is developer time?" That's a very broad question. But I will say this, that they can be. Does anyone have any comments on that?

SC: I was just going to say, from an HER point of view, as I said, obviously, the ability to keep upgrading to future versions of Arches for HER, but also to enable information transfer between HERs. It's very important that we are singing from the same hymn sheet. So I think we need to agree that what goes into - once we get more traction with more HERs, we'll have to build a group so that we can start building consensus. Obviously, it's very much our view at the moment with input from other people. But we can build a view saying this is how we're taking Arches for HERs forward. If you want to deviate from that path, then you do so at your peril.

ALE: OK, great. So I'm going to go ahead and close this webinar. Thank you all for attending and especially through the Q&A. And if you have any questions about additional questions about Arches, you can go to our website. You can see it on the screen. And if you have specific questions that were not answered here or questions that you just think of post webinar, feel free to enter those are on the Community Forum and someone will answer your question there. Thank you, everyone.