# Can you describe Legends of the Lough for me?

Ethan:

So can you describe Legends of the Lough for me, please?

P3:

Yeah, well basically I have to point out that Legends of the Lough is, we were commissioned to do like 4 apps. Initially they were to be kind of the same. So it's like 4 apps, four different locations and you just have to [hang on the single thing there - brief interruption]. Um and you just have to, uh. [unsure] swap out, you know the images, the text and blah blah blah, but and and the AR models. But it will be the same app, same structure, same everything and we came up with the idea of having like a a 3D view where you swipe across rather in a in a 2D canvas style. You swipe across the camera in the 3D room to get the parallax effect for free without anything to do because it's 3D. And you just, you know, move stuff in in, in depth in space and therefore automatically get the nice effect that you're actually, [pause] you know, getting parallax and overlap and everything, and later on it turned out that all these four apps were completely different, but at the time [laughs] [Which started off - unsure] Well, not completely different. Like they had still the same. We need this, but then in the first one we did. It was just uh planets. It was it was called Solar Walk and you just had a like a planet on each stop because it was right next to the [unsure of the name] Observatory and uh. [pause] It only had these models and then in the other ones they suddenly wanted to have. OK, we need to do AR that spawns on the ground plane rather than from the marker. Or we need an image gallery or we need some audio pieces and and and the last one had like a OM game translator where you type in your name and it translates to this ancient OM uh signs basically, that's just a like a Stone Age written language which just uses, Or do you know it? [then i wont go on about it] It's just like weird and it doesn't have like a few letters are non existent just needs some logic to take care of. But it's obviously the whole the whole game always needs to take care of uh what it is there. And since I developed it to be all in one, splitting it apart later on would have been a nightmare and breaking it, so there's loads of code that just checks so which application [unsure] And it just had like an integer, so your app type 1234 and then if if you're in this app type don't worry about that \*\*\*\* basically and just do something else. It it works. It's not nice, but at least it works on. On the plus side, if you, I don't know, if you figure out something and and fix it in one app. You fixed it in all four, so there's up and downs to that, but it's a it's a bit messier. Also, like we have images and some text in the resources folder. And to keep the build size down and also videos in some instances I need to move them outside the resources folder so they don't happen in the build, depending on what I want to build. Which is fine, which is also great if you just you know if it's just development by yourself, then you don't have to worry about it. Like, uh, at the very end it it it, it always gets handed off to [Unity Developer 2] who does the build and bring it onto the App Store. Um because he also does the iOS build then, so it's in in his domain to just do the build. And if there's an error, we figure it out um but but normally he does the final build on to the app stores and I just do the the normal APK builds and test it on devices and we can send that out to client and it's kind of worked well. So this legends of the lough thing, [brief pause] just like with all the other apps from that client. So I guess our client in that case. I'm not. [pause] No,[unsure - we will inclined. No. They were our client, but the whole thing came from the Mid Ulster District Council but in charge was a company called uh Tandem. um. Legally, I'm not sure [brief pause] Which one is you know if if we were to hear about, you know tandem or the Mid Ulster, who gave us command of what to do uh. Which one would be legally binding about, I don't know, legal structures?. You need to ask [Managing / Creative Director]. But they're they're a design team for the whole exhibition. So they they also know this stuff. And we've worked with them on plenty of other projects. But they wanted to use markers to unlock features, even if it was just audio pieces, so that didn't, like these markers, they look like these, should have seen before so they have like different symbols for for different stuff and it's nice we told them [brief pause] because it's unlocked in AR it it does not need to be a QR code, it can be any image. And we used them for the on the planets. And then I don't know, in two out of four of these apps, they ended up sticking QR code on top of them anyway. um uh. But anyway in in this particular project it had enough sufficient points with these and it's kind of nice and easy if you stand in front of something and just say uh look for the fish and scan the fish rather than look for this QR code because it's meaningless to the human eye to say, actually I think there's a bigger dot over there. It must be this one here. So that was quite nice. However, the unlocking uh of features was a pain in the hole to implement, but it got it working and yeah […], Yeah. No, that's then. Basically it turned out to be tricky. If you use AR to unlock an AR feature. It doesn't like it if you immediately remove AR functionality to get rid of that, basically. You found it, so you need to have like a a little stage of like 1/2 a second where you say OK, you shut down all the plane recognition and everything or the the image recognition and then start it again for whatever feature it could be. And sometimes if we went back into audio, we would close the camera again and go into just normal interface where you just show a UI panel and it would just float out and give you the audio options or the gallery or something like that. All in all, like this was a really long term project. And I think also we just [pause] published one or did an update on one? That was, I don't know, that I did over a year ago. And [pause] they're having the launch kind of now like this week or next week, so. So I haven't opened that and then there was a big panic as to it's not working and the guy there couldn't define what isn't working. So we did the whole test and it turns out that it actually was working. Which is good, but it could be anything like these, these markers they they looked like they weren't quite sturdy and obviously this was [Michael? like an?] Island, so the elements don't do the marker any good. Yeah. So we were thinking it might be broken and that's why it doesn't scan, but actually it turns out it it was fine. It was human error, so to speak.

Ethan:

Yeah, that will be a picnic. Problem In Chair Not In Computer.

P3:

Yeah, yeah, basically [laughs]. And some complaints why the, I don't know, I don't know, a board member who is 90 years old, why it doesn't work on her phone. It's like most likely her phone is, I don't know, 10 years old. And there are features that are not supported. But anyway, if they take the grandkids it, should be fine.

Ethan:

So can you

P3:

That's.

Ethan:

tell me about the goals of oh, sorry, carry on.

P3:

Yeah. No, no, I'm. I'm. I'm not sure how in-depth of an explanation of the app you need. I mean, do do you need to see the the screen or the code or anything or.

Ethan:

Oh, no, no, it's just like a synopsis of the app, basically. So I think you covered that. So the one thing I think we didn't grab is what were the goals of this project?

Well, the goals of this project was basically to it's a. It's from a uhh from a council, the idea that you have [pause] a walkway where you want to invite people to have a walkabout and have additional entertainment that they follow a certain path according to the app so that they get some in depth info and they use the nearby facilities and just to promote the area in general for tourists or locals alike. That that's that's the gist of the app, so it's free. It's not, it's not paid for. These apps are free on the App Store, and you just have to show up there, scan the QR code, download it. But obviously you could download it beforehand if you if you Google it and then you just walkabout so they always work for Android and iOS. When we do the apps it's mostly they need both.

Ethan:

Must be a pain with iOS.

P3:

It it is not easy, but actually, I don't know. It's not that bad because unity actually. With their uh AR framework, or in this case we used Vuforia, which is also available uh and supporting both platforms you don't have to worry about that many things and even the map systems we use. uh. [brief pause] What's it called? [pause] Hang on, let me let me check what it's called [pause while searching] um Mapbox. So we use Mapbox for the map and that, that works in both as well. So there's there's not much [pause] difference in coding. It's just if there is an error on the IOS build, sometimes you need to jump through a few extra hoops. Um. but mostly with with the apps, we develop on Android, just because it's really easy to uh ,you know, roll it out on different phones, test it, and you know, like there's no point if you if you just change one line of code to say, oops, I made a mistake there, it should be this first and then that then just do a new build put it on your phone and see yeah, it's working. Whereas I don't need to, you know, export it out of Unity, bring it into Xcode, export it out of Xcode, upload it to the Apple site, distribute it through test flight and then I can test it. It's like, anyone who just wants to solely develop on iOS must have, I don't know, a death wish, or something like. It's just, I don't. I don't know. I don't know why you would do that. Or maybe if you pay something extra to Apple you actually to get the cable, just plug it in and it works [laughs] straight away off the phone. I don't know, but therefore we always do the Android version first just because it's so easy to build and change and when it's locked down and say yeah, this is approved now, now we we are going to the app stores then we obviously go straight to the uh to the both app stores and it just uh.

Ethan:

Uh, can you tell me about the type of technology used In the project I know you mentioned AR and I think you said marker tracking?

P3:

Yeah.

Ethan:

Is there anything else involved?

P3:

So the the, the technology is obviously we have Mapbox for location based stuff. So we need the GPS signal from the phone. We have the AR functionality off off the phone using in this case Vuforia. We've done other apps where we're using AR Foundation, which then splits directly to AR core and AR kit and. Other than that, it's just a normal 3D scene with uh overlays, so there's there's video sometimes. There's images. There's 3D models in the interface. And obviously 3D models to be positioned by AR and there's audio pieces as well most of the time we have. [in? - unsure] when we we have 3D models, there's some hotspots in 3D's which are just, you know, icons floating there, giving extra information. And when you click on them, there's a panel that opens up that gives you the extra information. Sometimes with an image and then that's that's the thing we've used in these a badge system, as we call it. To give incentive to go to all of these stations to collect a badge which is obviously nothing more than an image A in a in a in a in a separate panel. Then the app that you can check up and see. OK, I've done all the stations. I got all the badges like there's no extra reward for getting all of them, because then again it's free app and there's Yeah. uh, you know nothing they they can actually do it for you there um and. And once you've gone through the stations, the app is done with you. And now in theory like they they, umm, they made this unlocking feature to be Uh mandatory for all for all these apps, and if you if you just download it at home, you wouldn't see the the content, basically, you needed the image to unlock. Now in in my case I have the print outs, so I can easily if you're working all the time. But we we made a feature in there so that people wouldn't have to unlock things all the time if they said but I want to see the giant or there's the giant again, or the mermaid again or whatever. They would only have to unlock it once, and then they could do it again. Now that only is true for for AR that is done on ground plane tracking. Whereas there's in in this app, there's two instances where it just is spawned from a tracking image because they are at the lake. So there's a post right next to the lake, and the mermaid should be swimming in the lake. So you need to focus on the image and then kind of pull back, [send/see?] instructions as well, and then you see the mermaid swimming in the in the lake. And same goes for the giant who throws a rock. So you have a post there and it's just at the shore. And when you, when you, when you get the image tracking, it just positions it a few metres back in the ocean. Then he throws the rock. Um. So the word animation is used as well. I don't know if it's a feature that it's 3 Or 3D models with animation. um. There's uh. [pause] Sometimes, [yeah - unsure] with the lake, there's an occlusion shader. Well, not really occlusion as in terms to AR occlusion. If you move an object in front, doesn't do that. I've tried that out on a few apps and in my opinion it's still not there like the the outline that you get from it [is] just no, not even the 90s were that bad. I think so. The No, it's just so edgy. It's not, you know, anti-aliased, it's just horrible. Like it's it's not a feature I'd I'd say it's useful. Not not for what we do. Maybe if you if you develop the game that's being played on the table, maybe. I don't know. uh. Or in the whole room and you need some [pause] rough estimate as to if something is behind the chair or not. Maybe. Yeah, but for for our instance it never really worked, so we didn't do that, but we needed something that obviously culls[?] the mermaid when she's on the water, basically. And uh. And that's that's easy to do anyway, like there's loads of loads. I don't know. There's only two shaders out there because it's not that tricky to to do apparently. Then what else did we use? Umm I think I think. That now there was also one feature which is called the Explore More section. Which ties into uh [Web Developer]’s uh database on the server where they have like a a mini, what we call CCT timeline. Which is basically nothing but a database that has like 4 values, like if it gets an ID, it gets a a name and you can [pause] a sign that, like an establishment, see there's a restaurant over there. There's a B&B over there and you can just enter a name. a short synopsis, an image. And a URL link so that, that you can add. OK, if you're there, why not check out the local restaurant or the local pub or whatever. And you can you can feed them, they are [brief pause] given control of that account to add in features and remove them. So it's not in our hands to keep that updated. So they just log in with the username and just say, oh, I don't know, there's a new restaurant open and you just add it or this one closed down and you can remove it and the app [unsure] just calls it in live. It just sends a request, a get request to to the server and it gets like a JSON file with these entries and I just split them up and make like this scrollable thing in the canvas which lists these these elements and populate them according to to the text and image entries. So that's kind of a nice feature. And later on we [probably] in the [progress?] we'll make an app where we use the whole app kind of pulls anything from that so. That's that's another special thing. And then just normal, you know, linking it to other websites. So there's a link to a LinkedIn page or a Twitter page or a Facebook page, and but that's, you know, bread and butter stuff on any app to to link

# Can you tell me more about the client for this project?

Ethan:

Could you tell me more about the client for this project, like their requirements and their background and bits and pieces like that?

P3:

Yeah. Well, the the clients are. um. Tandem, I guess, and they. [pause] They are. Well strict is the wrong word like, they also know what [to/we?] do. They can be picky sometimes.

Ethan:

Sorry they're what, sorry? They are?

P3:

They can be picky like they know what [to/they] do, but they can be picky about stuff where.

Ethan:

Yeah. OK.

P3:

they think It's good enough, you know, but. [pause] We we thought about stuff before as well. Like, it's never the case, but I guess everyone has that with clients. They would just do something blindly and not think about it. So we also have a thought process that's involved and almost nothing is done blindly, lets say. just this is guess in the blue and we just roll with it. so we think about stuff as well, and of course it's not our our first time doing stuff, but they [pause]. They are especially picky about the text, so when you do text you need in uh good control over the text components so they don't like...

Ethan:

Oh no, sorry. I mean like about the client and the stuff like who they are sort of thing.

P3:

Ohh so they are where they are. What are they? Well one place described them if they are exhibition designers. [...] Yeah. So they're exhibition designers and they're in charge of also the print graphics that go in there of the text, they sometimes work in cooperation with our text guy. And then just back and forth as to what they come up with, that should be said on the panels or on the app. um. I think they might do the panels themselves and it's just our text inside the app that's done by us. With with their their, you know, revisions put in there. Um. The. [pause] Given that they come from originally, there was mostly mostly print like they would just have, you know, the exhibitions back in the day consisted of something in the museum. We need to put the panel there and that's just great. They're quite finicky about the text. So that's just. Like we, we found that out when we did work with them the first time. Like theres certain vocabulary. If you have a line drop and then there's one word in the new line and just one. So I think it's [stepchild?] or whatever and uh that's not good. You need to which is. [pause]. Which is fine if you have fixed text. However, in a multilingual app, I haven't found a way to circumvent that, so if I'm pulling data from from a different source and the text is dynamic. I can't really control if the if the line break has only one word. So there's limitations technically that I can overcome and some that I just can't. And that's one of those.

# With regards to your client for this project, can you talk to me about who you worked with on their side and your interactions with them during the duration of this project?

Ethan:

With regards to Tandem on this, please can you talk about who you worked with on their side and your interactions with them?

P3:

Yeah, well, most of the time, I'd say it was [Tandem Art Director].And uh. Don't ask me for his surname, please, because there's two [Tandem Art Director] there, I think and.

Ethan:

If you can get, let me know. What is like job title is that's more. Than enough for [unsure]

P3:

Hang on. Let let me let me check my emails. Maybe let's see. I need to see. What do we have here? With [Tandem Boss], I think he's the boss. [Tandem Art Director]?and he is.

Ethan:

This is a MUDC?

P3:

Hmm. In his signature, he does not have a title there.

Ethan:

OK, So what did you like do with [Tandem Art Director]? I mean, I can make something up. I just need to take his name out.

P3:

Well, he he, he did. Uh, he provided us with. [pause] hm. What did he provide us? Well, obviously feedback. When when he tried out the apps. So he did that then. uh. He gave us [pause] images. And made sure that we got the files that we needed. And. Yeah, probably the flow of design aspects that they thought was was important. So we got like their the PDF print design that they had made-up for the boards and they got it from him. Now I'm not sure if he's the only one who made them because they're they're they're a big-ish company as well. So probably more people who are involved and he's the head of the department or something. So I'm not sure, if he did work on it, or if it's just some employee that worked on that and then it was sent to us by him.

Ethan:

You're not quite sure what his. How to?

P3:

I'm not quite sure what his work is on on on the app so. Yeah. Or if if it have an interview with [Managing / Creative Director], maybe he can explain it, what, what he what he does. [...] Ask [Managing / Creative Director]. He's He's more knowledgeable about [pause] what people do [with?] tandem exactly for for our work. For me, it's mostly going to the app and getting feedback and then doing changes to [pause] To get to the version of app that they would approve of.

Ethan:

OK. So you, you you like by my understanding, it's just like this back and forth?

P3:

Yeah. So the the.

00:25:36 Ethan:

Almost generic, sort of like everything. If things changes, changes.

P3:

well eeeeee Yeah. Yeah. Well. Yeah, but that's I, I guess that's the case with any app like you have to like the, I don't know in the history of app making there probably hasn't been an app other than the calculator or maybe not even there. We're just saying this is the version. Done. Thank you. There it is guys. So you just always need to have a bit of back and forth. And then obviously with apps there's always the [pause] I find the tricky moment is to. You anticipate something in your head and most of the time this works, but there might be a feature or a thing that you thought or we could do it this and that way. Or maybe that and that way. And then it's just like actually works neither way we have to go a third option and then you need to change something to accommodate for that. So that happens as well and you only figure that out while you do the app. You don't have the luxury to know that in advance. It's just like, OK, I have a fairly good understanding as to how this might work or could work. and sometimes you dont. As was as was the case with the unlocking [laughs] to unlock...

Ethan:

That's the fun part is finding all these problems and getting creative solutions.

P3:

Exactly. So like, I've been doing that visually for like in before that I was a 3D animator and uh I've been working with [Managing / Creative Director] for [pause] 16 - 17 years, I'm not sure. Uh. A long time so. um. obviously. Like, I don't know. In my younger years I build more mobile phones in 3D than they care to me, I don't know. But the clients just love mobile phones. And then the iPhone was invented and that stopped. No one needed a mobile phone anymore because they all look the same. And. Yeah, but.

# Using Miro board, could you sketch a flow diagram of the steps taken for this project, the way you understand it?

Ethan:

Using this Miro board board, could you sketch out a flow diagram of the steps taken for this project in the way that you understand it?

P3:

OK, well.

Ethan:

I know its a sort of awkwardly worded questions of any other thing. Anything else you want to ask about it. Basically all im after is like a pipeline, so it was this step then this step, then this step?

P3:

OK so.

Ethan:

Then we'll take those steps and extrapolate further.

P3:

I'm not. I'm not used to Miro board, so bear with me there. So first, it's obviously the brief. OK. So. I got the first brief which normally [period of silence] Cool. So there's the brief and then we have. Um. And then obviously normally, so the the briefs is probably like [Managing / Creative Director] tells us there's a new project. [Then its about that and that - unsure] That sometimes I don't know, maybe. Let's call it a pre brief. [typing] The pre brief for. [pause] For the [pause] for the code basically. Oh you know so so so he can uh he can get a better understanding as to how complex this might be. Um and then obviously once the client approves and says, yeah, let's do this, we we get the proper brief and then there might be more info from the client. And after that I do a first prototype I guess. UM. [pause] It also depends on [typing] How many people are actually going to be involved in this? Sometimes, like they're smaller projects, which just one of us guys doing a thing from start to end sometimes I also get help from the other guys. Like uh 3D 3D assets, I most often get from [3D Artist] and [Art Director] But also sometimes I just adapt stuff that I already have myself or we download the model from turbosquid if it fits our needs and we'll take it from there. Also. There can be. Like we did another project where we needed really good optimization and then it went through the hands of [Unity Developer]. Who's really good at, I dont know, crushing down polygonal values and draw calls [unsure]

Ethan:

Can you? Sorry, what does [Unity Developer] do? And what does [3D Artist] do? What are their like?

P3:

So [3D Artist], [3D Artist]is a a 3D artist and [Art Director] is also a 3D artist then.

Ethan:

Is that [3D Artist] by chance?

P3:

[3D Artist]. Yeah, that's [3D Artist]. So, yeah. But the company's not that big. So funnily enough, we had two [3D Artist]s [two people with same name, unsure if same job]. [unsure] So they have [unsure]

P3:

[...] No, that's. Yeah, it's but uh. [3D Artist], [3D Artist] And and [Art Director], whom you probably just [messed?, met?] as well, upstairs.

Ethan:

And what and what's does what's [Unity Developer]'s role?

P3:

And [Unity Developer] is also a unity developer. He's also [pause] ,you know, he came from 3D background using 3D Studio Max and uh He. [pause] He has. [pause] I don't know, a great ability of taking a model that could be, you know, came from Daniel or whatever in in the other project and he can really mush it down to to a really low resolution while keeping all the noise [brief pause] maps so it it in in that obviously it uh it doesn't always work, they can make the light maps and it's all nice. But in in that instance you could really crush it down and reduce the stress and the graphics kind of tremendously. um [pause] So he does that he's also [pause] Yeah, very experienced Unity user and sometimes. Uh. You know, we help each other out if there's a question. So I know you did that in the past. How did you do it? Stuff like that. So we do that amongst ourselves. Also with [Unity Developer 2], who's our third Unity operator, basically.

Ethan:

OK.

P3:

So.

Ethan:

OK so. [Please just - unsure, could be could we just] hop back to the flow chart. Then you have the prototypes, OK.

P3:

Oh yeah, sorry. And then obviously we need to. I don't know. I guess test the whole thing. [pause and typing] Internal testing, let's call it like that. [typing] So. [longer pause] And from there it's now uh. I don't know uh. Hang on, [unsure] best describe this. So if we. [typing] From the testing, obviously this changes. [pause and typing] Changes and new features I guess. OK, so I need to make this a bit smaller as it fits in the box. [pause and fiddling?] OK. And then it goes to the client. I guess for the first look. [typing]. Um. [typing] OK. So then we have the client feedback. um. And then we're in the cycle of uh [pause] Well, that goes kinda in another way now. So we have to change it. [pause and typing] That come after the feedback. And then obviously we need to test it internally before we send it out to the client. Kind of mandatory I guess. And then we just have more client feedback.

Ethan:

Ok so from the so the internal testing to the client feedback is kind of a loop basically?

P3:

It's kind of a loop, so let's see if it can actually do that. Yeah, cool. So it kinda goes like this. Until eventually, we are getting to [pause] a publishing stage. [typing] Which is the the last bit. Hang on, it might be. That actually come here after that? No. Well, there's a feedback as in all approved, I don't know. [typing] OK. Um. Yeah, I think that kind of sums it up.

Ethan:

Sums it up. OK, cool. So that's cool. I like that.

P3:

I'm not sure if it's if it's always like that. And some can be more chaotic than others and then obviously in between because many of these projects are quite long term, so it hardly ever happens that I get a project and i just work on it and and then a few weeks later it's done and it's published and next project and it doesn't work like that for the long term stuff. It's always like you work on this for intense thing then you send it out and then you [a]wait the client feedback. And obviously while you wait on that, you work on another project and then they get, you do a bit of that, a bit of this. So there's no real, that's why I found it hard to say how much percentage of the time that goes into the project. It's hard to tell.

Ethan:

Yeah. Yeah. No, that makes sense. I understand it was a bit of an awkward question, but I thought it was, if it was answerable, it would have been nice.

P3:

Yeah, well, so. So there's your answer. Basically, there could be in between any of these steps, there could be a change also depending on deadlines. If there's something else that needs to happen quickly so. And then another project will take up the time. This needs to be pushed out the door sooner and then you go back to this.

# P3 Legends of the Lough Pipeline

## Stage 1 – Pre-Brief for Quote

### Describe the begining of this stage?

Ethan:

For the pre brief for quote stage could you describe what happens at the beginning of this stage?

P3:

Yeah, well, [Managing / Creative Director] either has an idea or you talk to someone who says, oh, can we do this and that and [pause] gets asked for a quote and he [pause] he then asks us so, [pause] Can we do this? How long would it take? And uh. I've also had stages where I had to do a quick internal testing myself to see, [pause] can it be done? Like we had a [pause] [speaking unsurely / thinking] one of [slight pause] these things where we had to [pause] discuss a [pause] AR functionality that would recognise a whole table basically. And have the AR on the table. What would the best way of having it appear there be? And there's obviously [pause] object model tracking as well, at least in Vuforia, not in [slight] not in uh AR core unfortunately. um so I tested it out and it works really well. However, it's extremely [slight laugh] expensive so we couldn't use it in the end. Um but sometimes you just have to test it. What are the options? And then we try to have, like, you know, there's a a cube thing you can track so that you have either side. So basically you print out a few sheets of paper and we're just, you know, stock it on on the sides of the table and one on the top. um but it didn't work so well. Um so in the end, we just used uh image tracking. And not of the whole image.

Ethan:

So a lot of

P3:

[unsure]

Ethan:

making sure it's feasible basically right?

P3:

Exactly. Now, sometimes it's just, you know, also proof of concept. Can this work? We had that for [pause] For like there was a an art project where some guy [pause] who wanted to see [pause] If we can scrub audio along in AR. So basically had a long piece of like virtual tape, so to speak, and you dragged along that tape like a reading head. And that should actually, you know, track on the audio that that's playing there and reflect where it is on the audio part. So I had to do some testing for that as well beforehand so sometimes it's just proof of concept that it can do something or if it works or if it doesn't work.

### Describe what occurs during this stage?

Ethan:

Were there any other tasks that I've had during this stage, you mentioned a few a moment ago.

P3:

Sorry, I'm not sure what you mean by that.

Ethan:

Any other like tasks or jobs, so we're sticking with the pre brief one. So were there any other tasks that you haven't mentioned that occurred....

P3:

No, I don't think so. Obviously one part is how long, how long will it take. And UM. [pause] Most of the time, I guess it's obvious it takes longer than anticipated. [laughs] Which is, I don't know, a common problem in in our computer world. I guess that, even though the computer helps, it doesn't do the work for you. Um. I guess no matter how advanced AI would become. I hope that's true for forever, but the uh that's one part and the other one is trying to figure out how will we tackle this. So sometimes it's not easy to do a proof of concept, but just discuss how could we tackle this.

### Describe what this stage ends with / How you know this stage is complete?

Ethan:

And how do you know that this stage is complete?

P3:

Uh. [pause] Well, if if it's just a quick question as to how long has this taken, how do we tackle it? And [Managing / Creative Director] says thanks and [unsure] I guess [laughs]

Ethan:

You kind of have you have these questions answered basically is what It sounds like?

P3:

Yeah. So it's, it's as you might have realised in our company it's a [pause] It's a more relaxed and not so strict kind of environment, so there's no, strict rules also, it's probably down to the size of the company. It's not. It's not a not huge, so there's no point in adhering to that, especially trying to [pause] make a set of questions that would need to fit every project. It's probably impossible. Since most of our projects are vastly different from the previous ones. But not that vastly. But you know, they hardly ever is a project the same, and it's it's always kind of specific to the needs that just arise there now. Not that's not to to say that you don't learn over time to [pause] to implement features that you that you learn from the previous app you know. And then just build upon your your knowledge and old code that you that you worked on before.

### From Noho, who (job roles) is involved in this stage?

Ethan:

So from Noho, who's involved in the pre brief stage?

P3:

The pre brief is probably mostly [Managing / Creative Director] , and then depending on how many [pause] I guess ,departments is is a strong word, are involved, like if it if it's a if it's a big [gap?] and we need lots of 3D models and animations, then [3D Artist] and [Art Director] will be there as well. Also [Art Director] does do some uh. Uh. [pause] You know, art design. So he's the art director in some projects and he obviously puts gives his input as well as to how it's gonna look later on. But. uh.Sometimes he's there in the pre briefs as well, but not every project would have a pre brief. Sometimes I think just [Managing / Creative Director] Uh figures it out, he has a a generally good understanding of what's going on, and if it's. If it's kind of normal, it just does it himself.

### From the client side, who (job roles) is involved in this stage?

Ethan:

And so who from the client side is involved in this stage?

P3:

Um.

Ethan:

If you can answer if you can't, it's fine.

P3: I dont know.

Ethan: You don't know, ok.

P3:

I don't know, to be honest, there's probably someone pitched an idea to [Managing / Creative Director] or [Managing / Creative Director] approached someone and then he said, oh, that's a great idea. Can you do this? And then I don't know he he goes through that stage. So that's a question for [Managing / Creative Director].

### Can you describe the tools you used during this stage?

Ethan:

So can you describe the tools you used during the stage and why you use them?

P3:

Well, the tools, If I if I have to try out something would be Unity or if 3D is involved for for for that test I need something, I use my good ol trusted SoftImage. Which has been unfortunately discontinued, but it still works fine and uh I like to use it.

Ethan:

Sorry, and thats spelled like soft image.

P3:

It's it's like a. It's like a soft image. It's it's. Yeah. It's a 3D program It's a 3D program. That uh used used to be around and then Autodesk bought it and discontinued it.

Ethan:

Ohh, great. Sounds about right.

P3:

So uh yeah, we we don't like [laughs] that too much about it.

Ethan:

Don't lose your disc copy basically.

P3:

Yeah. No. Well, the the, it still works. It's 10 years old and it, in my opinion, hasn't aged at all. Like, it's great at what it does and it's it's fast, it's super intuitive and.

Ethan:

It's amazing how many 3D programs Autodesk needs.

P3:

Well, that's what everyone thought. And back in their head, they knew they're gonna ditch one of those. But it was the they're on the message board always affirmed No, no, no. We're gonna keep all three and the power of the three. And then, I don't know, a year later, they said that we're gonna discontinue SoftImage and yhey kept Max and Maya. So. But then again actually Autodesk didnt own any of these 3D applications, they bought all three and uh Yeah.

### Would you consider this stage “unique” to this project?

Ethan:

Would you consider this stage to be unique to this project?

P3:

The the pre brief for the quote. Well it depends. If it's just a quick question, how long is this gonna take then it's not unique if I have to figure out if we can track and hold object then it might be unique yeah.

Ethan:

Yeah, like in the sense of this stage doesn't happen for other projects? I've been struggling to explain this one.

P3:

Exactly. Yeah. No, that that pre brief is not happening for every project.

Ethan:

OK. So it's like semi unique I guess.

P3:

Yeah, yeah.

Ethan:

So it it's dependent again OK.

P3:

Yeah.

P3:

It depends on the project whether or not that comes up.

### Can you describe the collaboration between yourself and the client during this stage, if there was any?

Ethan:

Yeah. And you said there wasn't a client during this stage, at least none that you interacted with.

P3:

Yeah. No, not for me.

Ethan:

Not for you, OK.

## Stage 2 – Brief

### Describe the begining of this stage?

Ethan:

So for the brief stage, could you describe what happens at the beginning of this stage?

P3:

Well, the brief stitch is normally. [pause] [Managing / Creative Director] telling us about the project and what we're going to do, what we have to do. This sometimes might also be followed up by meeting with the clients who talk about their stuff, with their side of things, but not necessarily. Sometimes we just get like a PDF or whatever and [Managing / Creative Director] already talked to the client and gives us information.

### Describe what occurs during this stage?

Ethan:

Are there any other tasks that occur during this stage?

P3:

Well, sometimes like um time of the artists, like the schedule is pre planned in in a few bits and pieces by either [Managing / Creative Director] or [Producer].

Ethan:

Sorry, what does who's [Producer]?

P3:

[Producer] is [pause] the producer.

Ethan:

Producer, Okay.

P3:

And she also handles many [pause] client aspects, you know, chasing them up on can we get feedback on this? Can we get the you know the fonts for that and blah blah blah. During that like user interface is normally done by [pause] either two people [pause] When when they design it. So it's either [Digital Creative Manager] who, who does the design for user interface or sometimes [Art Director]. And they will be, you know, designing a a prototype and then maybe have internal client feedback on that before I get a file, but sometimes it just goes hand in hand and they get a design file like a UX file. UM and. Just implement that into my prototype and sometimes the the first prototype just has generic boxes or whatever. Or an old uh, an old interface that are just [abused?] from the previous projects.

### Describe what this stage ends with / How you know this stage is complete?

Ethan:

Questions. OK. Sure. Yeah, it's OK. So can you describe how you know that the brief stage is complete?

P3:

Well, the brief stage, [pause] I guess it's a bit fluid obviously. Normally once once the meeting is done and maybe a second meeting with the client as well and we know [pause] what the story is, I start You know, building the prototype. So this normally doesn't take that long, but I guess sometimes you get the brief and don't start the prototype immediately because there's still open questions that we need answered. Um. But but normally after the meeting it's pretty much done and then you get to work. it occasionally if it's, I don't know, really dependent on some other elements then sometimes you wait for these elements before starting the prototype, but basically the the brief is done and you already know what to do. You're just waiting on stuff.

### From Noho, who (job roles) is involved in this stage?

Ethan:

[…] from from Noho, who is involved in the brief stage?

P3:

Well, obviously, [Managing / Creative Director]. Uh. Then [pause] for the brief, most often [Producer] as well. Because she's producing, she needs to know, you know, to chase the clients and know about the [pause] the work. Um. Then for 3D stuff [3D Artist] and/or [Art Director]. And for interface staff, [Digital Creative Manager] and or [Art Director], depending on what it is like we've we've done projects where the interface is also in 3D and then it needs to be [pause] different because [Digital Creative Manager] doesn't do 3D work. She she she can't really create that. Um. so. [pause] And then who else would be there? [Writer] would be there if there's something to be written. So [Writer]is our writer. If there's copy to be written, then he would be in charge of that and he some times has to do, you know, research and [pause] um write stuff up and send it to the client. Now that [pause] sometimes can happen before the prototype, that there's been a few rounds of of this. Especially if if the copy is kind of fundamental for the app. If if you don't have that text of what's going on, then it might be, you know, hard to do [pause] stuff if you if you don't have the about what it is um so. [murmuring underbreath]

Ethan:

Sorry, you said copy copy of. I think I missed.

P3:

The copy copy refers to the text like the anything that's written in the app, [or] says welcome to this app, we are great and blah blah blah. And also, I don't know, sometimes if it's an historical historical information about this is, I don't know, the Dublin wall and protected us from Vikings or god knows what. And uh then he he he can be in charge of that. But sometimes the copy comes from the client. So he might['n] be always there. And then if there is a web aspect of it involved, there's also [Web Developer]. Who's our programmer and web developer. So I think I think that's all, I hope I'm not missing anyone.

### From the client side, who (job roles) is involved in this stage?

Ethan:

And then from the client side who's involved in the brief stage?

P3:

Well, like I said, sometimes there isn't a client involved because [Managing / Creative Director] already talked to the client and he gives us the information. Or maybe we have a PDF from the client. And uh sometimes we have a meeting with the client where they, you know, tell us about the the project and how it's gonna look or how they envision it. And then we start off. So that's I wouldn't know the job positions of of them sometimes it's...

Ethan:

Just the the client in general, I guess that's like.

P3:

I guess yeah. Like so I'm I'm normally, I don't know, I. In my position there's no differentiation as to who gives me the information. If it's, if it's the CEO, I don't know if anything [unsure] with our clients. I don't know if it's the CEO or I don't know, the intern, I don't care as long as the information is valid. [laughs] I I put it in if it's if it's doable and if it's not doable. I talked to [Managing / Creative Director] and he can say sometimes then we can push back on that if that means you know seven days of programming for a tiny feature, that actually no one will notice, stuff like that.

### Can you describe the tools you used during this stage?

Ethan:

OK, uh, can you describe the tools you used during this stage, the brief stage?

P3:

For the brief stage. Well, I I use a piece of paper and a pen, [laughs] to be honest. So I just have uh written notes as to how it's gonna look. Sometimes if it's, [pause] If it's uh story boarded by [Managing / Creative Director], then we get a scan of the story board. Like he, he draws the storyboard as to what is to to what's what's to happen? Sometimes it's just a few ideas sketched into his notebook. But they are, you know, they are scanned by him and then sent to us as an image. um. So sometimes we get that, but it's not something I I would, you know, create. So the storyboards come from him and sometimes [Writer] I think, but it's uh for me it's just notes at that stage to to figure it out in my head and remind myself what features I need to put in.

### Would you consider this stage “unique” to this project?

Ethan:

Would you consider this stage to be unique to this project?

P3:

No. Well, that's kind of that's most projects have that. Like obviously you need to brief us to know what to do, I guess like. It's it's kind of quintessential to know what to be doing.

Ethan:

You don't wanna do the shotgun approach.

P3:

And yeah, [you] know you need, you need some sort of info. Let's do an app isn't enough to make an app. I can I can make an empty an empty app, but that won't do anyone any good.

### Can you describe the collaboration between yourself and the client during this stage, if there was any?

Ethan:

Did you say there wasn't really any collaboration between yourself and the client in the brief stage, right?

P3:

Yeah. No, no. Other than maybe being in a meeting and maybe asking questions. So if they try to explain something, I just, I might ask how they mean it so that I get an understanding of what they actually want. But that can happen, you know, at any meeting in between later on, when it's just, you know, client feedback. There could also be, you know, when I'm involved in that, there could be a meeting and we talk about the [I guess understanding of what is or isn't working - unsure]

## Stage 3 – Prototype

### Describe the begining of this stage?

Ethan:

So for the prototype stage. Can you describe the beginning of the stage or what you do at the beginning of the stage?

P3:

Well, the beginning of this stage is obviously look at the notes that I've written down and see how do we, how do I tackle this? What is needed, what is essential. And I try to make a [pause] I don't know a a robust thing. I seldom rely on plugins. So sometimes they're needed, obviously, and then then it's fine. And for example the the map box stuff, obviously I needed a plugin. I'm not rewriting the whole maps GPS stuff all by myself. That would be nonsense. But for many things I find that. [pause] For navigation like, I need to make the camera move between different positions. I need to have a swipe animation for a camera to move around or something like that. I I just write that myself when whenever I I need it or what do hotspots do when you click on them and all that logic. That's just [pause] my own scripts that I write and sometimes I reuse certain parts of codes that we used in different projects. So if I find ohh we had this section that we needed or we need the map section again. Then I tried to structure the code that I have certain sections and then copy uh them into a new projects, or maybe even I have a which I I just called GM which is kind of the game master script where most of the logic happens in a central place. And. Uh. [pause] Other scripts might just call into that, uh, the uh instancing so that I don't have to always find reference and then uh [pause] I do the the logic there but some other scripts are just dependent on the main master script to to do all the stuff. So that way I think it doesn't get too distracting or too confusing. At least I hope so. Now I'm not sure if properly trained and taught programmers do it the same way, but it has worked for me fine for a quite a few years so I just stuck with it.

Ethan:

Yeah, as long as it works and it's, it's definitely worked well for me as well. You said sort of like you start just like you look at what you have to do and.

P3:

Exactly. So I just assess what does it need to do? Have I done this before? Is it completely new? Can I reuse some of some of the old stuff? And then I just dig into one of the other projects and uh take my code that I've previously developed so I don't have to start any everything from scratch like if i I got if I had to play pause functionality on the on the bottom of audio, then let's just take that from there and stuff like that. um.

### Describe what occurs during this stage?

Ethan:

How about any other tasks that occur during this stage?

P3:

So other tasks are obviously if I have already designed stuff like for user interface or if I have some models, maybe not the final ones, but even some models. Obviously I need to grab them from the other people and bring them into the project. Sometimes we have, you know, copy. as in the text and then I need to figure out is this text like static? Is it dynamic? Should it be loaded in? [pause]. Like I have a a semi dynamic way of of of of dealing with text because I find it easier where I just make a Google spreadsheet and have like a a layout like each line copy one hotspot and then have like a title, the main text, the subtitle, something extra information that that needs to be stuck in there and then it's just uh basically big spreadsheet, that I then export as a as a CSV and [pause] no, actually it's a TSV because the comma might be used, so I only use the tabs as a separator and then I I bring it in with a script of mine where I just go through the text and just to make a big array of of it, and then I can reference it later on and whenever I need to update something, it's far easier to to do it in the spreadsheet and do a new uh overwrite in in the in the resources folder rather than having it all inside the project somewhere. So I deal with that depending on what what app it is and the same goes for images that might have come from the client. Or sometimes I need to source an old model that we had as well and just mesh together. Or if it's just really a, a really bland prototype where we don't have much to go on, it's just, you know, a box with colour and then, the pop up box is another colour that might be transparent and then text in it, it's just the default font. And ,obviously, later on we obviously we we [pause] we have our own funds that are, you know, specific to the project. Which might be a decision from the client or a decision from our designers, either [Digital Creative Manager] or [Art Director] and then we just pick that. Um. And then it's just trying to, you know, tick all the boxes for each functionality. So did it do this? Did it do what does it need to do? And does it work? And obviously, that's my well internal testing is when I give it to the colleagues and to [[Managing / Creative Director]] to just show around. Does it do what it's supposed to do? How does it look? What do you think? But obviously internally I I have it [running] all the time. Now, depending on the aspects of the app, like if it's an AR, I have to put it on the phone to test the functionality. But other stuff like general interface that happens on the canvas side of things. I can test most of that in the editor. for some reason, like I really love the way that Vuforia kinda hmm has a like an emulation mode for the webcam. Yeah, so that you still get some AR functionality, whereas if you're just using AR foundation, you're kind of stuck and you're not getting anything from the webcam because it knows it's not a phone. That's that's a bit of a pity. So in that case I just have to use it all the time, but I think Vuforia bloats the app. Like if you have an empty Vuforia scene, it takes up almost 100 Megs [Megabytes].

Ethan:

Ohh blimey, yeah.

P3:

Yeah. So it's like [pause] Why is it so bloated? You need to be more streamlined, or if you have an empty, uh, you know AR foundation. It's like 25 or something thereabouts. And it's like 75 megabytes for nothing and we always add lots of models and textures and everything in there so we don't make small apps anyway. But 75 extra is just too much in my opinion, so I recently uh dismissed Vuforia and then using the ARfoundation implementation of unity directly with that. Vuforia[?].

### Describe what this stage ends with / How you know this stage is complete?

Ethan:

How do you know that this prototyping stage is complete?

P3:

Well, if I if I have it depends on either there's a deadline, we need a prototype until this day to show it to someone. Then I obviously try to implement as much functionality as I can until this point or as much [pause] content. Like if [pause] most clients, if they just see oh there's a grey box and there's a blue box and like it doesn't look nice, they kinda are scared, you know? If if even if under the hood, there's great magic happening. Uh if it doesn't look nice they think what the \*\*\*\*\* this? you know? They they can, even if it's a great proof of concept, they might not understand that it is. And they think [pause] nothing happened for for that money, where in fact it did, and all I have to do is, you know, swap out the graphics at the end and just replace a few boxes with images, and then it looks nice. Um. But the designer didn't have a chance to do that or they haven't signed off on anything. So it's either I've reached, you know, I'm I implemented all the tasks that need to be implemented and then obviously the prototype is done or I have to work to a certain date so that we can show stuff off and we just have a limited functionality and maybe a bit of graphics in there, even if they're not final, sometimes, we'll just use something even from another app that we had previously in there so that it doesn't look ugly.

### From Noho, who (job roles) is involved in this stage?

Ethan:

Yeah, so from Noho, who tends to be involved in the prototyping stage.

P3:

In the prototyping stage is uh [pause] obviously me and then depends on who's, who's taking care of the [pause] like interface design and sometimes of the client as well. Like [Digital Creative Manager], might be involved heavily if she did the design, but also if she's in in contact with the client a lot. Then she might be someone who tests it as well and gives me feedback, and then we send it out to the client to get more feedback from the client. But she she she would test it quite a lot. Obviously [Managing / Creative Director] tests it as well. And. [pause] Sometimes [Art Director]. Later on, if if there is something like, [Unity Developer] sometimes has an interest to just have a look at it and test things out. And. Yeah, that's most of it actually.

### From the client side, who (job roles) is involved in this stage?

Ethan:

OK. So from the client side, who's involved in this prototyping stage?

P3:

From the client side. Actually, well, only if we have to chase up on some material that needs to go into the prototype. But I just work to my tasks, basically. So there might be [pause] Can we get the font if we already agreed on the font? Then you already make billboards or whatever, then can can you send me the font? And I already used the right one rather than picking anything that they say. Oh, that's the wrong font. Uh, do you know who in this case would be chasing up? No, no. Like like like before, it's just the client is a generic thing like there's not, uh, one person I might not even be chasing them up myself. It might be [Producer] or [Digital Creative Manager] who's bothering them and not me. Occasionally that happens, but most of the time it's someone else.

### Can you describe the tools you used during this stage?

Ethan:

Can you describe the tools you used during this stage and and why?

P3:

Well, obviously Unity and we should [laughs] Visual Studio as the editor. Um. [pause] No. [pause] That's that's the tools and then. [pause] Like nothing else really. It's just a list, you know, piece of paper and a pen. Yeah. Sometimes draw the idea, figure out some math in between. If, if you have to. I don't know, I had a project once where I had to orbit the moon around uh an elliptical path and I needed to drag it along an elliptical path and it needed to move, so I just had to figure out some math or whatever. And then pen and paper is easiest. And obviously the the good friend Google in the browser [laughs] to to look up what other people done in that situation. Uh. Why is it not working? You know? Stuff like that. So that's, I don't know. Hope I hope every developers on the same boat that has the same [laughs] issues.

Ethan:

If it's comforting, I'm that too, so.

P3:

OK. Well, that's that's good to hear. So.

Ethan:

Have to Google how to save to servers every single time as I forget the syntax for the networking.

P3:

Yeah, like theres there's some parts like [pause] resources, like I offload in the resource and then it's like [pause] And where do we convert it that it needs to load in that resource as a Sprite? Is it before? Is it in the end? What was the the exact name of it? I'm not sure and then it's just either I look up an old script where it is, but then it's hard to find or I I Google it directly if it's faster.

### Would you consider this stage “unique” to this project?

Ethan:

Would you consider this stage to be unique to this project?

P3:

Well. In terms of methodology, no. Yeah, it's not in, but it's the same thing. Like, I'm just taking off a list implementing features and these features. Might be unique-ish to the project.

Ethan:

Yeah, but this prototyping stage it happens on. It's a key stage. It's like a stage of every project you do, I guess?

P3: Yes, Yeah. So that, that, that happens at every like the obviously the the first incarnation of of the app is not the final. So and I just call the first one the prototype. Umm.

Ethan:

Always struggled to explain this question because actually I've got an example. It's like if this stays like say the stage where you have to do some really random testing, for example that you don't have to do everything else, that's like a unique stage because only for this project. And I always really struggle to explain this unfortunately.

P3:

Yeah, yeah.

Ethan:

It makes sense in my head.

P3:

Yeah, yeah. No, no, it's. Yeah. No, it's in, in, in our case, I guess it's it's always the same. It it has to be the first thing.

Ethan:

Yeah.

### Can you describe the collaboration between yourself and the client during this stage, if there was any?

Ethan:

And then you did you say that you didn't really collaborate with anyone in this stage from the client side?

P3:

From the client side. Not really, no. Just get resources whether whether I get them directly or someone else it it depends on the project. If I'm directly involved in the line of communication and get data myself, or if someone else gets it for me.

Ethan:

Yeah. And in this case, was it we said it was more people doing it for you?

P3:

Yeah.

Ethan:

Yeah. OK.

P3:

So in the in the Legends of the Lough, it was more people doing it for me.

## Stage 4 – Internal Testing

### Pre-Questions

Ethan:

So go up onto the [pause] um internal testing stage.

P3:

Which I think we touched already briefly that the the testing is kind of [unsure - done by?].

Ethan:

Yeah, we've talked about the testing as well, so.

P3:

By [Managing / Creative Director], [Digital Creative Manager], myself and sometimes, you know, [Unity Developer] wants to have a look or [Art Director], but that's about his like, [Writer] hardly does internal testing and you know [neither?] does Kevin and stuff like that. So eventually like if it's [pause] if we know there's an issue or potential issue, I get. uh. Can anyone with an old phone you know try this out? And then yeah, for example, [Web Developer] did test a few apps as well where he had [pause] an older version of a phone, and it's just, wanted to see if it works on this phone. But that's kind of one in the later stages, so that's not the first initial testing.

### Describe the begining of this stage?

Ethan:

Can you describe what happens at the start of the internal testing stage?

P3:

Well, at the start I'm [pause] I'm happy to have gone through the list and have a prototype. Yeah, and I'm, obviously, I'm testing it myself until I'm happy with the way it works. So it's normally not the first, the first builds that gets turned on testing like I have to [pause] be confident with what I made and be happy that that it's working fine like there might be bugs and it's not final in functionality or or looks, but it's stable enough and then I give it to [Managing / Creative Director] and [Digital Creative Manager] and they have to go at it and say yeah, that's good. And they might have comments. Ooh can we do this? Or actually I got the font from the client or we we need to do this before we can send it out or they say no, it's fine. We we let the client have a look at it. So that's when actually that touches on changes and new features depending on what what the other guys say. If they say ooh can we do this instead? Or can we add this feature or? [brief pause] We just realised that if we do this, we need to do something else.

### Describe what occurs during this stage?

Ethan:

Are there any other tasks that occur during this stage?

P3:

With the testing, no.

Ethan:

OK, so you just covered everything in that last question?

P3:

I think so.

### Describe what this stage ends with / How you know this stage is complete?

Ethan:

[…] And how do you know that this stage is complete?

P3:

Well the the stage is kind of like I I probably should have put it in one box to be honest. Like the internal testing and changes in the features cause, I know when the whole section is done. When if implemented the changes or new features or else if there wasn't any comments to change anything and then now it's working fine, let's send it to the client. Then we just send it to the client to get some feedback. Because hardly ever was a client happy with the first draft and said that it's grand, we don't change a thing, you know.

Ethan:

So like so you're saying the it's these. So you said these two stages that are sort of completed so that it's more like? On top of each other, I guess as opposed to linear?

P3:

Yeah. Yeah. So they kind of go hand in hand when it's tested, they're either are changes in features or not and then it goes to the client. Once [pause] once we are happy internally in our home. Then we just send it out to get the feedback. Maybe there is, there could be an explanation as well. Just just to to fold it in that [pause] If we know like this isn't working, if you press this button it breaks. Then we might mention that to the client and say. This functionality is not yet implemented the buttons there because we just stuck it in, but it doesn't do anything. Or if you click it, yeah it breaks. Just be aware of that or something like. that or something like. That. Yeah. Well, you know, if you have to sometimes explain stuff because it's a development process and you're in the middle of the process. It's hard to give a flawless final result every every time. So you need to sometimes make people aware of it. And, you know, hiding the functionality can be tricky if you just say ohh deactivate all the buttons or whatever then you might be spending ages figuring out why the button isn't working because you deactivated It a week ago to to send out the version that doesn't break when you click it.

### From Noho, who (job roles) is involved in this stage?

Ethan:

So from Noho, who's involved in the internal testing stage?

P3:

But like I said. [...]

Ethan:

Think you've mentioned names already.

P3:

Yeah. Yeah. So, [Managing / Creative Director], [Digital Creative Manager] and myself, most of the time it's us. Uhm.

Ethan:

And you said people will sort of dip in and out as they want to?

P3:

Exactly. So sometimes [brief pause] if if I want more feedback from other people in in regards to stability and a wider range of phones, I just said it can everyone has like an Android phone, just give this a quick try and see if it works. But that that normally happens at a later stage, so it's it's in the in one of the, you know, internal testings later on like the first prototype. I'm not too concerned, does it work on every phone or what does everyone think? Like we, we're happy with it amongst the I don't know the core group that that normally does it and then we await the feedback from the client, what do they think?

### From the client side, who (job roles) is involved in this stage?

Ethan:

And is anyone from the client side involved in this stage.

P3:

Well, as soon as we ask for the client feedback then the client is involved. But before that, no.

Ethan:

OK, that's a few steps along with it. Yeah. OK. I'll remember that one

### Can you describe the tools you used during this stage?

Ethan:

that one. Can you describe any tools you used during the internal testing stage and why?

P3:

Uh. No just the Android phone. So and then you know, just write down notes piece of paper. Obviously other people might put it in an e-mail or a basecamp post or whatever um. But there's no no specific tool for that, like I don't have a like. I don't have a log that just says, you know, this is the bug log and they need to fix it. Like the neither the projects nor the company I believe is big enough to [brief] have something like that, it might too complicated for the benefit so. I just end up with loads of, you know, loads of different notes like this and whenever something new arises, sometimes it's a bigger piece of paper. If it's a really long list. But for for quick fix this it's normally just a piece of paper like that. Yeah. Let's just write down what I need to change and or add and and that's it. And then let's just take it off my list.

### Would you consider this stage “unique” to this project?

Ethan:

Would you consider this stage to be unique to this project?

P3:

No, no, that that would be happening with every project like we need to, we need to go through it and see that we are happy before we send it to the client.

### Can you describe the collaboration between yourself and the client during this stage, if there was any?

Ethan:

Then you had no collaboration in this stage where you personally...

P3:

Collaboration with the the guys who are testing it.

Ethan:

Ohh sorry, I mean with the client. Yeah. Sorry with the client.

P3:

No, with the client. No

Ethan:

Yeah, you said nothing happens [until?] the client feedback OK.

P3:

Yep.

## Stage 5 - Changes and New Features

### Describe the begining of this stage?

Ethan:

So we can move on to the changes and new features stage. So can you describe what happens at the beginning of this stage?

P3:

Uh. Well, once, like [Managing / Creative Director] and [Digital Creative Manager] would have a look at the app, they [pause], obviously, every person I guess when they read the brief, have their own thought in their head as to how to look like or what did you do and they try it out and see if it aligns with what was discussed with the client and what they think it could do or it could do better or they have an idea that if we if we change that it might be nicer. Um or if like a a warning message before it covers the entire screen so that you can't see behind it and stuff like that. Things that just happen when when you see them and then we changed it on new features that they see. Ohh actually we need a map feature or something like that and then let's just add it. Then again, I have my list so I have another list again and uh [pause]. Once that's done, obviously I didn't make another thing that that I test [unsure] as it works because I always have to test it and know that it's working, you know, the app, once I did my changes, I need to make sure that it works before we send it on to the client.

### Describe what occurs during this stage?

Ethan:

Are there any other tasks or jobs that occur during this stage?

P3:

Mmm well, there could be if it's a new feature, I might have to do a tiny bit of research as to how to do it. So [pause] that that could be it. Normally like if it's in that early stage, it wouldn't be that we just quickly you know get another model or something but it it it can happen if we say ohh [pause] remember like 2 weeks ago we used the donkey or whatever. Can we just plonk him in there? There were not in this scenario but like we have a big library of assets that have accumulated over years. And uh. Frequently, we sometimes we can borrow from from other stuff that we worked on before.

### Describe what this stage ends with / How you know this stage is complete?

Ethan:

And then how do you know that this stage is complete?

P3:

Well, again, when when the list is empty [laughing], things check that that's it, that that's my method. Like when when I work I just have notes and yeah, I just tick off the boxes and then when I'm done, I'm done. Sometimes I add my own notes to the list, like it mightn't just be all colleagues but while I'm working on, I might realise, oh, wouldn't it be nice if it did that? And then I just add another feature or whatever because. I think it will be good.

### From Noho, who (job roles) is involved in this stage?

Ethan:

And then from Noho, who's usually involved in this stage?

P3:

In the changes?

Ethan:

The changes one, yeah.

P3:

Well.

P3:

They they gave me their feedback. I don't know if that required like [Managing / Creative Director] and [Digital Creative Manager] but other than that, I'm implementing it myself.

### From the client side, who (job roles) is involved in this stage?

Ethan:

Yeah. OK. And again, no one from the client I guess, because?

P3:

Because, yeah, no, no one yet. Yeah, they haven't. They haven't seen the version up until then, and once we've seen it and they're happy, only then does it go to the client.

### Can you describe the tools you used during this stage?

Ethan:

Can you describe any tools you used during this stage and why? I guess I think I know.

P3:

Well, I guess it's the same as the other one. It's it's just, you know, we use, I use Unity, Visual Studio Pro is the code editor, but uh, it's not that I say the best editor in the world, it's just it comes with the [unsure - Unity?] and works nicely enough. Like I'm I'm not too keen on trying to get any other editor. It's nice to have auto completion and as long as it does that, then then that's good.

Ethan:

So why do you use Unity, if you don't mind me asking?

P3:

We like I did the switch to Unity like I was a [pause] a 3D animator for uh for many years before that. And then I kind of gradually got wedged into the Unity thing by [Managing / Creative Director]. So we we are we are trying to do more um interactive stuff not not necessarily with the app-side of things, but with the Uh, with the interactive touch screen [...]

Ethan:

So you sort of use Unity just because that's what you were asked to use, from what I understand?

P3:

Uh exactly. So we had, I think I'm not, I think we had [Unity Developer] on as well for the other project, And uh he was using Unity. So we just used the same to start off and [pause] obviously there is [pause] Uh the Unreal Engine out there, which we're kind of [pause] sometimes looking over with envy. But you know, we we have lots of assets and stuff in there that, code that's already there, even though it can be translated like [pause] It's tough to switch the pipeline now that we n[unsure] , you know, three people using it and stuff like that. Like we might try it out on another project, but that's the main reason because [Unity Developer] was using it and that's why we ended up using. It as well. And then I just, cause I always. Like I'm not a programmer, but I I did do some [brief pause] some small scripts in my 3D application to help me along with with certain tasks so, I understand code a little bit. And that's why it kind of was a good fit. And initially I didn't want to do it really, but it was a good decision, I think so. It's it's a nice challenge. It has been a nice challenge and it just keeps, I don't know, keeps growing. So it was touchscreen applications initially and then it was apps and now it's a lot of AR application apps and [brief pause] God knows what the future beholds.

### Would you consider this stage “unique” to this project?

Ethan:

Then would you consider this stage, to be unique to this project?

P3:

No.

### Can you describe the collaboration between yourself and the client during this stage, if there was any?

Ethan:

No. OK, no. Then again, no collaboration between the client as of yet?

P3:

No

## Stage 6 – Client Feedback

### Describe the begining of this stage?

Ethan:

In terms of the client feedback stage, can you describe what happens at the start of this stage?

P3:

Well, at the start of this [stage], it's shared with the client, either by [Managing / Creative Director] or by [Producer] or [Digital Creative Manager] or sometimes myself, depending on how the communication with the client was before. And uh. [pause] Then we just ask, So what do you think, basically? Is this the right direction? and we might have an explanation as to what is working, what isn't working, what's still on the list to be done, and stuff like that. Just to give more insight rather than ohh here it is and go figure out the rest kind of scenario so they know Ohh yeah, they're working on it. This is a. Well, it's often we we have to use that it's work in progress. So it's not the finished result. There's still stuff to be done. And that's why not everything is working and it doesn't look so nice maybe. And normally they accept that when when it's communicated, and then that should be fine. UM. [pause] And then they let us know what they think, basically. And they say, yeah, that's great. Go on. Like, carry on like this. Just add the other features and let us have another look later on or they say, ohh, can we do this or we thought it would do that and it would look different then we just, I just make another list. And only goes, but that's that's already for the new for the next

### Describe what occurs during this stage?

Ethan:

OK. Are there any other tasks that occurred during this stage that we might have [missed}?

P3:

Well, no, but that's mostly it. Can be either e-mail or we just have a a quick video meeting or whatever. For the for the feedback this so sorry, maybe I can mention that as well that sometimes it works two ways. It could be a demonstration that uh [Managing / Creative Director] and or [Digital Creative Manager] or both do a screen recording of the app in [pause] In in on the phone. So to see how it works. Um. Can always be, you know some some clients only have iPhones and then you can't share it with them and then they need the video to see what it's doing. Um. Or it might be easier to get the video to them rather than the full app, in case it might break too easily. So just make a video of the functions that are there and that works nicely. Um. [pause] So it can be the full APK or a video depending on the client and the situation.

### Describe what this stage ends with / How you know this stage is complete?

Ethan:

And I think you did say how you know the stage is complete. You said you just get another list of, like changes?

P3:

Yeah, basically either. Either they tell me in a video meeting or they, uh. [pause] already sent back an e-mail, of what what isn't working.

### From Noho, who (job roles) is involved in this stage?

Ethan:

So from Noho, who's involved in this stage?

P3:

So that will be obviously myself [unsure] [Managing / Creative Director] [Producer] might be involved as well if she's producing, you know that that she's in the loop knowing what the client said. And she takes notes and then, you know, knows what needs to be done then. If we agreed on another deadline for another meeting and stuff like that, so that everyone knows. Uh. How far it needs to progress to a certain point? And uh. [pause]. [Digital Creative Manager] if she's involved in the design, she she will be there as well.

### From the client side, who (job roles) is involved in this stage?

Ethan:

And how about from the client side? Who's involved in this stage?

P3:

Well. That's a good question. I I I don't know the answer to it. It could be. [pause] Like sometimes it's just one person we're talking to. Sometimes it's a bunch like it could be 3-4 or five people who who all have an opinion on this. Now it could be you know the client and the client's clients depending on the structure. That's yeah, that that they deal with. So like in this case, obviously the first client is middle, so close to cancel and then we have handed in between and then it's us. So we could get feedback from tandem to do that. And then once they are happy they could send it. OK. Now we show it to MUDC. And then [unsure] back back feedback from MUDC. Hm. Sometimes uh the changes from MUDC will end up reverting changes from Tandem and stuff like that. That's that's the funny thing with clients sometimes. Um. But you never know everyone everyone who's working with has a look and sees. OK, I think it should work like this [pause] now. And do you know who from Tandem that would be? No. Well, sometimes, like [Tandem Art Director], was involved heavily in the MUDC project. Um. [Tandem Boss] sometimes as well, but other than that, like there's there's a few people, especially in the graphics department or in the design department you also send stuff. But I'm [pause] I'm not sure who's involved in the in the whole decision process as to what feedback is then given in the end. Like most feedback emails for that project I got from Richard.

### Can you describe the tools you used during this stage?

Ethan:

Can you describe the tools you used during this stage and why?

P3:

Yeah, e-mail, e-mail and [Zoom].

Ethan:

E-mail, e-mail and zoom. Nice and easy.

P3:

So that's that's, that's the tools basically and then again [pause] piece of paper.

### Would you consider this stage “unique” to this project?

Ethan:

OK. Uh, would you consider this stage to be unique to this project?

P3:

No, no, that's that's fairly standard like there's loads of meetings until you have to finished results. You you can't avoid it. now. You will never have more meetings than in an EU project. But that's a different story.

### Can you describe the collaboration between yourself and the client during this stage, if there was any?

Ethan:

some collaboration between yourself and the client. So you mentioned it could be through videos or [pause] giving the APK, are there any other could you describe this collaboration again to me between yourself and the client?

P3:

Yeah, well, normally it's it's pretty straightforward. You just get an e-mail saying we want this, you know, to look a certain way or we want just to move a certain way or functionality or the button, does it actually or is it the same size as I designed it? If it's, if it's design have the or [unsure] font related, text related, content related like ohh we need to write a text for that because at the moment it's still in Lorem Ipsum and we haven't thought of that. And then they just need to come up with some text. If they write it themselves, or if [Writer] writes it on our behalf then, [pause] We just need to let [Writer] know we need a text bit for that project basically. Um. Then what else is there? It's like sometimes we also.

Ethan:

Yeah, with like with the. Sorry

P3:

Sorry.

Ethan:

So, uh, like with the client specifically, is there anything that you?

P3:

Well, sometimes we do.

Ethan:

Interacted with them with, for example?

P3:

Yeah, we sometimes like a we can do a screen share session, where I show them directly what's happening. Also, that's an option. Um. [pause] You know where, sometimes it can be a tiny bit or can be move this like a couple of, you know, millimetres off the top or in a few weeks of this [and] there and and some stuff can be easier if you just see it on the screen and just go does just look right and then they can go yeah, that's fine or, you know, picking a different colour, or stuff like that that they [brief pause] pick then. It's easy to do it with the screen share. Um that can happen sometimes not very often. Sometimes it's also used as a [pause] uh way to display the project like if it if we don't have a video or an APK, I can just hit play in the Unity editor and show it to them what's there. Now obviously this cannot cover the whole functionality if it's AR, but for many other scenarios this is fine.

## Stage 7 – Changes and New Features

### Pre-Questions

Ethan:

Now what's next is back around to these changes and new features.

P3:

Yeah. Yeah. So obviously, once I get my list from from the client either, yeah, verbally or in a written form, I still need a list to work off. I just get going in Unity again and try to accommodate for that. Now sometimes in in that scenario that might be. Ohh now we need this 3D model to look like that and then I need to reach out to either [3D Artist] or [Art Director] so they do, they can give me the the 3D models. Or I might need a design[,?] texture and then reach out to [Digital Creative Manager] and she gives me one for the interface if I need one and uh. It could be that I need some script like some copy in in written form. Then I need to reach out to [Writer] so that he can get me some some text. And I just have to, I don't know, draw it all together and put it into the app. So until then, every every change is kind of met.

### Describe the begining of this stage?

Ethan:

So you describe what happened at the beginning. At this stage you have your list again.

P3:

Yeah.

### Describe what occurs during this stage?

Ethan:

Yeah, you've gone through what occurs during this stage. Is there anything else you might have missed, do you think that's?

P3:

No, I think I think that's that's it, yeah.

### Describe what this stage ends with / How you know this stage is complete?

Ethan:

And then how do you know that the stage is complete? I didn't quite catch if you mentioned it.

P3:

Um. Yeah. When when I tick the list or when there's another client meeting team, you know when when sometimes in like the client wants to be informed more often than we might have a weekly or a biweekly meeting. And if the the list is too long to do it all in a week or two, then sometimes even then a feature isn't implemented yet and then it just needs to go to the next round of stuff. Or a complication might arise that, I don't know, sometimes a small feature that you thought oh this can only take an hour at most, you end up spending three days on because. stuff isn't working as it's supposed to, or at least in your head, it's not working. Um and then [pause] You don't get to the other sections because there were complications with with another part of the app that you haven't foreseen and then you don't go the full list. And and then it goes [pause] without having ticked all the boxes, I just need to make a build then.

### From Noho, who (job roles) is involved in this stage?

Ethan:

OK, so from Noho, who's involved in this second changes and new features stage?

P3:

Well, like I said, obviously the departments that I need stuff from. So which might be if I need something from the client for that, I might reach out to [Producer] or [Digital Creative Manager] or [Managing / Creative Director]. Or to the client directly. Some. Sometimes that's the case as well, or if I need [pause] some 3D elements I might reach out to [3D Artist] or [Art Director] to get 3D elements from them. Sometimes if it's, if it's a model that has to be purchased, I might go to TurboSquid and purchase it myself. Or if it's interface related like a 2D texture, I go to [Digital Creative Manager] and she will address that issue and give me some textures there. Or copy then it's, then it's [Writer] if it's if it's text, it's [Writer].

### From the client side, who (job roles) is involved in this stage?

Ethan:

Then from the client who's usually involved in this stage?

P3:

Well, at this stage, only if we need [pause] anything from them which could be, you know, audio files that they need to record or photos that they need to provide.

Ethan:

And you said again that you were mainly going through someone.

P3:

Mainly, yeah.

Ethan:

Yeah, you're going through people [unsure]

### Can you describe the tools you used during this stage?

Ethan:

OK. And then can you describe the tools you used during the stage?

P3:

Well it's it's the same as with the other changes and features. It's unity, the editor and the list, yeah.

### Would you consider this stage “unique” to this project?

Ethan:

OK. Uh, would you consider this stage to be unique? Sorry if this is getting repetitive.

P3:

No, no, there's there's no, it's not. It's not unique. It's like there's always some, you know, you have to go through a few rounds of client feedback.

### Can you describe the collaboration between yourself and the client during this stage, if there was any?

Ethan:

And can you describe any collaboration between yourself and the client at this stage if there was any?

P3:

Yeah. Well, the collaboration is I tell them, or we tell them we need some files, give them to us, or else [laughs] you're not gonna get your happy faces. So that's that's the collaboration.

## Stage 8 – Internal Testing

### Pre-Questions

Ethan:

Onto this next internal testing stage.

P3:

Yeah, well, the internal testing is there because we can't send out a version that hasn't been [pause], you know, seen by us, and I don't like to send out, like if it's just a minor thing [pause] It might be optional, like if if I just had to, I don't know, change one little thing, I can make a new bill and send it straight away, but if it's if it's more substantial, like and it's a few things, then obviously I'd like [Managing / Creative Director] to have a look and [Digital Creative Manager] to have a look to see is the app doing what it's supposed to, what you think and then we send it on to the client again.

Ethan:

OK, so it's sounds quite similar to the...

P3:

It's exactly the like the first one, it's just more eyes, recognise more mistakes. You know, if if you just have another set of eyes then they say, oh, actually, yeah, there's something funny going on or I click the button and it went through and you know some mistakes that you obviously are gonna make uh you mightn't see them because you know where you click most of the time, like I obviously, I always try to [pause] do stuff that you're not supposed to do. In my app, you know click some other

Ethan:

It's hard when you're developing the app though [laughs]

P3:

Yeah, click a button while an animation is happening. Whatever what happens to the animation, stuff like that. Um. Will will the window just be halfway visible because I I clicked it again and then it wouldn't open and stuff like that. We have like 10 of that. That moved to the side and move out again. Is it breaking anything if I click on something? Um. Stuff like that, that that will happen more like if I really want to break an app and test it, I send it to [Web Developer]. He he he has a good, good eye for this, this.

Ethan:

Yeah, I I know someone like that too [laughs] So you said it's it's pretty much the same as the other internal testing.

P3:

Exactly, exactly. It's just. It's just to let someone else other than me has had a look at it and sees yeah, that's grand. Most of the time it's [Managing / Creative Director] basically because he's he's the boss, you know?

Ethan:

Yeah. So if it's the same, I won't ask same questions for same answers. We hop on to the client feedback again.

## Stage 9 – Client Feedback

### Describe the begining of this stage? / Pre-Questions

Ethan:

what happens at the start of the second client feedback stage?

P3:

So again, they're either shared a video of the thing working on the phone from us, or they get an APK file which they can try out on their own phone. And or else we have a a shared screen where I hit play in Unity depending on [pause] you know is it is it a big progress meeting? Should we have something more to show? Is it just a tiny bit or is it one of the first ones where it just go we haven't really had a chance to make an app yet but it's [pause] it's almost there, but it's working in in Unity and we just need to do some more development before we can go there and. It's like it It's pretty much like the first one.

Ethan:

Like the first one feels like the first one again. Is there anything like new that wouldn't have been discussed in the first one that's worth mentioning? Or is it just the same?

P3:

Not, not really. There might be in [pause] in that there could be a testing [pause] Or that actually might refer to the internal testing. I don't know, but with the client that happens on site. like with with this app for example, like they are tiered to this trail that's happening around Lough [Gerr]. No, not Lough Gerr uh Lough Neagh. Sorry too. Too many Loughs that I did that for. So it's it's Lough Neagh. And given that the posts are there and you have these these markers you need to test it in situ. Otherwise, uh. you know, you just you have the coordinates, but you need to make sure like you have a map feature that actually,you know, the the the map shows you standing in front of the marker when you are actually standing in front of it and not somewhere else like like another [unsure]. And it might be inaccuracies due to GPS. But just to get the coordinates right that you that I punch into where these markers should sit on the virtual map and that it works with the markers that are on site and anything that might occur where people say ohh actually I don't know, we're looking in the wrong direction because the lakes over here and we thought it's there and stuff like that that inevitable can happen. So that's... that could be, you know, part of internal testing when just someone from us is going up there, but sometimes it can happen with the client as well. Then one of the guys, [Managing / Creative Director] goes up or [Digital Creative Manager] goes up with the client and or meets the client there. And they have the quick trying out there basically.

Ethan:

So that's everything that's different I guess?

P3:

That can be different in one of the later ones like obviously you're not going up there for the first prototype and seeing how it works there, but it can happen at a later stage. And for for in in in in this case for that app it happened. I think a few times they were up there.

## Stage 10 – Publishing

### Describe the begining of this stage?

Ethan:

So can you describe what happens at the beginning of the publishing stage?

P3:

Yeah, at the at the beginning of publishing, it's the client has signed off on the app and says great, I need it in the App Store yesterday and I've taken too long to sign off on it and that's what normally happens, but we we always advise them that once we say we publish it, it's out of our hands and then it's up to Google and Apple to decide if it's alright with them or not, and it might take a week to say Yeah, it's fine or Nah. \*\*\*\* that. Do it again. Um. So. There is a like a variable that we obviously like to uh, I don't know, have a bit of a uh cushion on so normally I think if we can with these long term projects, we like to have it on like 2 weeks before. But as you most likely know, hardly ever anything goes to plan, so sometimes it's just a big scramble. Like we pray that Google and everyone else is just approving it quickly and that it works.

### Describe what occurs during this stage?

Ethan:

Yeah. Can you describe any other tasks that occur during this stage?

P3:

During publishing, yeah. Normally like even though we have a list, uh it most often it gets ignored. In the beginning like it's always the same thing, basically we need an icon for the app. We need the exact name and sometimes the client wasn't even aware that we they need to give us the name it's needing to be called in the App Store. Um. And then we need a little description, the title and sometimes they write that and sometimes we write that or [Writer] writes it. Um depending on the involvement in the whole project, like if he didn't write anything for the for the whole app, he's not gonna write the blurb because he wasn't involved. Um. But that's needed and the banner image is needed and stuff like that. So that needs to be made-up and normally that's happening during the publishing action. Whereas ideally it should have happened before [unsure], it's always there and [unsure] say publish it, we already have the information. Like we're trying to change that or [Unity Developer 2] will tries to change that so that we have this info beforehand and then not OK can you publish it? And so do we have that text? Do we have that image? Do we have the logo? And it's like [brief pause] it's some of these will always be missing. No, like most of the time. So it's always a scramble to to get all the information quickly so that we can publish it. And then two app stores. We need a test flight version running as well because the screenshots on the apple thing need to have the exact aspect ratio as the iPhone and it can't be the aspect ratio of the other phone and they never have the same aspect ratio. For literally no reason whatsoever. Yeah. So you need, you need actually to make the screenshots in each version different, so you need it. You need it to run it.

Ethan:

Just to be a pain.

P3:

Yeah.

### Describe what this stage ends with / How you know this stage is complete?

Ethan:

Probably be a very obvious question, but how do you know that this stage is complete?

P3:

Uhm, this stage is complete when it's gone through the App Store. But then, as you know, accidents can happen and there is something that isn't working. Occasionally it can happen that we say, OK, we publish it now, we know there's a few changes they would like to get in, but the launch is in a week, so we need to publish now. Yeah. And then maybe these three bits are not working fully, but they will be or we're trying to push an update which is normally quicker than the first initial attempt to publish and then hopefully that goes in on time. If not, there's at least some version which is better than not version at all.

Ethan:

Yeah, absolutely.

P3:

Which which can happen within time constraints. [unsure] it's not ideal. We don't like it, but it can happen. And obviously sometimes it can happen that it's, I don't know, you know, just there's a bug and then you need to do another publish with the, with the bug fix. And sometimes Google is up your. uh. [pause] up your hole and wants to make a new build with a different APK version uh, with a different SDK version for also no reason whatsoever um.

Ethan:

Yeah, I think I've had that with Oculus or Meta.

P3:

Yeah. So that that can happen as well and uh. Sometimes, obviously, even a year later um, well, you never know what happens in the app stores [unsure] to remove it. If it's just once off thing like we had a promotional app that was only there for a TV show, then obviously I'm not too bothered about that. But like these apps, they're meant to be there for quite some time, especially since there's an installation on site, with a QR code, that you scan to download the app. This app cannot disappear, so you just need to maintain it.

### From Noho, who (job roles) is involved in this stage?

Ethan:

So from Noho, who's involved in the publishing stage?

P3:

Uh the publishing is me handing it over to [Unity Developer 2]. And [Unity Developer 2] is the actual publishing. Ethan: What does [Unity Developer 2] do? P3: [Unity Developer 2] is also a unity developer but um normally due to time constraints he's doing the app publishing, especially since he also needs to make the IOS version of the app, and he's the one with the fancy Mac. Like I don't have an apple computer here. Like we we talk about that I should do or I should be able to do the same tasks like it's not rocket science. And we did it as well over the phone with [breathe in] [Managing / Creative Director]'s Mac and you know doing doing the build and uploading it. Um [pause]. Yeah, but it hasn't happened yet. So I just need to get the Mac and and hopefully be able to to do the publishing myself like I've done it occasionally to update an app. UM. And for iOS we did this from scratch, [Managing / Creative Director] and myself, but normally it's [Unity Developer 2] just for speed.

### From the client side, who (job roles) is involved in this stage?

Ethan:

And then from the client side, who is involved in this stage?

P3:

Well, that depends on if you need a few bits of information someone has to reach out and say ohh we need that text, that description or we need to decide on a name now. Then anyone who has the power to say the app is called such and such. Um. And then that's fine. So it's just someone with enough authority to to give us the materials or the info that we need basically. But then again, most of the time I'm out of that process then like if I hand it over to [Unity Developer 2], he's looking for text, it's. getting sent directly to [Unity Developer 2] because he has to fill it in into the App Store profile. He's also the one whose [longer pause] is getting [pause] shared in the developer account, from the client side.

### Can you describe the tools you used during this stage?

Ethan:

And then can you describe the tools you use during this stage?

P3:

Well, obviously Unity for building and Xcode then on the on the Mac side to do the iOS build. And uh. Then obviously after that before it's fully published on the IOS side of things, there's a quick test on the on the Apple phones to see if it's working the same as the Android which normally does, like theres hard[ly?], Like I don't think there has been [pause] And that's what we figured out. Ohh no, I've used the feature that only works on Android but not IOS, so it's normally working as it's supposed to. There might be some, you know, debugging in in Xcode needed where some package needs to be a different version number or massaged through in a certain way. But other than that it's it's normally fine and [pause] [Unity Developer 2] just battles [through it] with Google if it's, if it's a bit fiddley.

### Would you consider this stage “unique” to this project?

Ethan:

OK. And would you consider this stage to be unique to this project?

P3:

No, that that's all. So every every project needs to be published. Like, not necessarily, sorry, not necessarily actually we had [pause] an instance where we had an app that was only running on tablets in the museum, in which case there's just the APKs. So there and then there's no IOS side of things and it's just APKs installed locally on the tablet. Which which is kind of publishing in in a in a smaller nutshell rather. Yeah, but you don't need anyone else to help you out. You just say there's a file. Click install.

### Can you describe the collaboration between yourself and the client during this stage, if there was any?

Ethan:

Can you describe any collaboration between yourself and the client during the stage, if there was any?

P3:

Yeah, we're mostly gathering uh information about name and details about the description. And uh sometimes getting shared on their accounts. Because they need to be set up as developer accounts, they need to host the apps themselves. Sometimes we had to temporarily publish it on our own account. And then you can transfer it onto their account. But it's kinda, I don't know. Google asks you a lot of questions if you wanna do that, and they normally don't like to transfer apps to another account. So we tend to stay away [pause] from that just to make the process easier, we tell them you need an account. And normally we tell them in the beginning, but they never set it up in the beginning and then at the very end so do you have the account? No. And then [pause] [unsure] in the scramble and and do it. Yeah.

# Would you describe any of these stages as a bottleneck?

Ethan:

OK, so I just have two more questions and then yeah, we're all sorted. So looking back at any of these stages, would you identify or describe any of these as a bottleneck in the process?

P3:

The bottleneck in the process would be, I don't know, my capacity of how much you can fit in a day of work [given unsure] the tasks and. However, I'm not sure if you're through 2 developers into it, it would be any easier. Like the. uh. [brief pause] When when it comes to like, even if it's just 3D, most people will do things differently, I notice. and when it comes to programming, I found like there's so many ways to skin a cat and everyone just programs in a different way. So [pause] you would either have to force one method onto the others, which also isn't nice um [brief pause] or let both work co dependently, but then it's like [pause] but I have this master script that takes care of all the logic. If you don't use that, then how will it work? So most of the [pause] most of the projects are there for one man jobs and some people can jump in if someone's sick or holidays in case of emergency and try to dig through it and figure it out. But normally it's just one guy. Whoever started it finishes it. With the odd occasion like you know in, if if there's changes to be done and the other one isn't there.

Ethan:

So just so I'm understanding what you said. So it seems like [pause] you're saying the bottleneck is just time basically?

P3:

exactly.

Ethan:

Yeah, time and knowledge, I guess.

P3:

Time and knowledge, yeah, but [...] But obviously like if if it was the best programme in the world and then and then you ohh I just need to type these two lines and I will take care of everything. And then yeah, time would not be of an issue but I guess.

Ethan:

So out of these states, which would you say that applies to?

P3:

Well. Wherever I need to do something in Unity and programming so it will be the prototype and all the changes. Where, where it where It's just time, you know. Depending on the size of the app, that's [brief pause] I don't know, that's the price you have to pay um to to develop it. It just needs it. Just needs time to implement the features and making it.

Ethan:

As well as that thing you said about people doing things different ways, which I guess is the knowledge aspect, with people doing different things so [it doesnt neccessarily - maybe] co-mingle

P3:

Yeah. Well, though I'm not sure it could be, you know, beneficial, like whether you have like more master script that takes care of the logic or individual scripts that you here like sometimes it's a mixture of both the value both the values but the main logic is mostly handled in that script. And then others will use lots of plugins that take care of the camera rotation and stuff like that for us. I tend to have mine do something else with the with the handwritten script. But that's just a different approach to the whole thing. And I wouldn't say either one is better. So they both are valid and I I don't want to. I wouldn't want to be the one to decide, no, we need to stick with that. Obviously if it's my project, I know what to stick with because, it's only me. But if two had to work simultaneously on the same. Umm. then its [unsure - harms?] Now we do have collaboration in the same project like we use Unity collaboration and now it's plastic or whatever and that works fine as well on certain aspects. For example the uh the the optimization process that [Unity Developer] did. He was just working on the models and to replace them and did uh lightmap bake. And then saved it out as a prefab and I just took that prefab into my scene. And in that case that works fine to be working on the same scene, but logic wise I think it will be hard. So.I don't think there can be any [pause] any real advancement? We already split it up that we have, you know, someone doing 2D graphics, someone doing 3D graphics, someone doing the writing and someone doing model optimization if it needs be. [pause] But if you were a bigger company, there would probably be some solution out there like strict guideline to adhere too, and then that's the way you do it. Like obviously I know there are applications being written by loads of people together simultaneously and it works as well. Um. For our size, I think it's too much, basically.

# Do you think any of these stages could be modified with the addition of a different tool or piece of technology?

Ethan:

So do you think any of these stages could be modified with addition of a different tool or piece of technology?

P3:

Yeah, it it like, there's always new tools out there that can be that can be great. So for example like the like the Vuforia when we started out using the Vuforia rather than the built in Unity [AR?]Foundation. Um. We [pause] just recently with the [our?] conference, there's another tool called [pause] 9 some or 8. [pause]Forgot the name. [pause] Basically a different AR solution that just scans an area, a physical area. And replaces that as the use of the marker so you don't have a marker, but you don't have ground plane tracking either. It recognises an area. It's 8 wall or 8th Wall or something like that. That's the name of the the thing. So we'd like to look into that for our AR stuff. Because, like we've tried a few approaches [pause] and the marker is great to position it exactly the way you intend to, because you know how the market is oriented and if it's installed, but if it's not available to be installed [pause] then you have to revert to ground plane tracking, but then the model could end up anywhere, basically. So we've added features in over the years where you can move it or rotate it around so that it fits better. And we have good descriptions that help people do it. And with the latest app that I'm doing now, that's currently in development. I I have a line drawing of an existing [pause] 360 image of ruins that are on site and you align and I don't have feedback if it works yet. I like the I overlay it on the camera view and they align. They go to the same spot aligned the lines with the object that's there with the ruins and then they hit place and when they say that's fine and place it, I just find the ground plane underneath the phone, and had them measure the distance from the camera to the object and it just spawns it a certain distance away at a certain rotation and uh it should be perfectly in place. So it's kind of auto positioning without like it's using ground plane tracking, but you don't have to look on the ground and touch it to do that, you've aligned it with the help of the guidelines. and then you hit that's it use this location. Now, whether that's the perfect approach, I don't know. Um and we've used in EU project, we've used Google Cloud anchors which is a similar approach that recognises the area and it was a great concept.

Ethan:

But not quite there?

P3:

work flawlessy. It was like it wouldn't always recognise it. Sometimes it would recognise it immediately. Sometimes it would take like 30 seconds for it to recognise it and it's like if you look around for 30 seconds as a client, you're not happy if it's, it's not popping up. Um. So I heard that the the 8th Wall product is working better. [pause] UM so. […] It's just like there are different options and you just need to, you know, keep an eye out. Basically, whatever works best will work best and and then it's it's obviously dependent on on money like the tracking feature from Vuforia to track whole objects. We just did uh I we did a photogrammetry scan of the object to to test it out and [pause] that worked great. But it would cost 15,000 a year on licencing. So we said uh the whole project isn't gonna be make that much, so we can't afford that. But there is great technology out there. It's just a matter of...

Ethan:

What sort of benefits do you think this better AR tech could bring to your pipeline?

P3:

Well, the the pipeline is so the if if the user is involved, stuff can go wrong. So ideally if you rule out the the interaction part as to where they need to stand and where to look to position stuff. the more accurate it can be if if I know where the phone is and where they should be standing and where they are standing because it recognises the area, then they can place the object exactly where I want to position it. Same with the marker. If there is a marker, I know it's here, that's the dimension it's printed on. So if I go one metre to this side and 1 metre to that side, it's going to be there, and that's fine, and that's where I spawn. Which is great, but if you can't have a marker or it just. looks ugly if you [unsure] in some instances you can't position it like if it's a [brief pause] if it's an old castle or ruin, you just can't put up these markers anywhere. Like they, they don't like that and uh. then you're out of luck. You might use a photo of a section if it's really that distinct. But there's obviously no guarantee that it will work once it's, I don't know, if it had rained, then the stones would be wet or whatever, and you can't use that as a tracking marker anymore, and it would look different, and it would not work. So same same applies for the new tech. Like what? What is happening if you go in autumn and there's leaves on the ground, will it still recognise this place as it this place? Um. Yeah, so. There isn't one foolproof version yet that does it automatically to detect where you are and and position the object for you. So it's it's the the downside of can we put something up Or do we choose to let the human click a button to say I'm in the right position, I'm looking at the right angle, just do it.

Ethan:

Yeah. That makes sense. So something to I guess more for that, to make it easier for the end user, right? That's sort of the benefit.

P3:

Exactly. So like we're we're trying to make it easier for the for the end user and with each incarnation, I have a different idea [laughs] to do that. And the latest one is to have that line drawing and just plonk it there in the distance where it's supposed to be. But that that also depends on the [pause] Uh. [pause] On the. [pause] Or the type of app basically on which uh which content do you want to show and where and how.