Transcript

May 25, 2023, 1:48PM

Henry Calvert 12:23

OK, let's get started. So, good morning. Good afternoon, good evening, wherever you are.

Henry Calvert 12:32

My name's Henry Calvert from the GSMA. And I'll be your moderator for this webinar this afternoon.

Henry Calvert 12:40

Just a couple of house rules. Let's keep our videos off unless you're speaking so we know who's who's actually speaking at that point to point in time. Please, if you want to ask a question, verbally raise your raise the hand.

Henry Calvert 12:57

But also we are very keen to get some questions in the chat and we'll prompt you every now and again to get those questions through there. So you know, welcome to everyone that's joined us. This is the open gateway community meeting. So an augural kick off meeting it says meeting number one. I feel like it's meeting #2 because we did this this morning obviously to keep to ensure that we respected the Eastern Time zones.

Henry Calvert 13:27

And this is the afternoon session to respect the Western time zones from Greenwich Mean Time.

Henry Calvert 13:33

So this is sort of an introduction to the open gateway the community is going to build where we're talking to operators today mainly. So I'm and of course if there's ecosystem players on the call then that's absolutely brilliant. But the messages are pretty key to operators. And then we want to build this community out looking at use cases where we can use APIs to provide network exposure in software code.

Henry Calvert 14:02

The developers and enterprises understand, so ultimately wanna reach those developers and enterprises. Once the operators get to actually understand what they're doing.

Henry Calvert 14:14

Uh, as this is a GSMA uh official meeting.
On the next slide, please, Olu.
I have to read out the GSMA antitrust, so please bear with me for 2 minutes.

Henry Calvert 14:27

So the GSMA antitrust policy, all GSMA participants must abide by. The following rules do clearly identify the positive purpose of each project and follow it.
Do consult with legal in areas where you are unsure.
Don't enter into agreements that restrict other parties actions or creates barriers to market entry. Don't discuss or exchange information on pricing, business plans, or any other confidential or commercial sensitive data. Don't discuss or recommend any reference prices or any particular pricing policy.

Henry Calvert 15:08

More information about our antitrust policies can be as can be sought at our website, www.gsma.com. Thank you very much for that formality and let's move on to the agenda. A really great agenda today.

HC **Henry Calvert**   15:24

I we have 3 speakers that are going to tell us about what are the individual industry.
A partners doing to support this Open Gateway initiative. So you'll hear from myself, you know, how is the GSMA involved and then we'll hear from Camara. Really the North star of what's actually happening and and Marcus Camel will will will lead us through that.

HC **Henry Calvert**   15:51

And then we've got TM forum to also express how they're going to be able to support the Open Gateway initiative and how the work that they've been doing over the last seven years with ODA fits in very well and and will lead us to fulfillment and operations and maintenance. And George Glass is here to talk about that.

HC **Henry Calvert**   16:13

Umm. Then we will, uh, get a little bit more exciting after, you know, sort of those formalities and we will hear from Telefonica, uh, Warren Burrows.

HC **Henry Calvert**   16:24

And also Deutsche Telekom, Marcus again on how they've been actually deploying these comara API in industry and the use cases and and where they see the benefits. So that's a really good, interesting bit and hopefully we'll have time for Q&A. We'll we'll have a little break for Q&A after the first Open Gateway initiative overview as well. Just for everyone that's joining sort of the, the, the.

HC **Henry Calvert**   16:53

Policy we're taking. Please keep me video open if you want, but would like the videos to close so the speaker can can be seen.
Because how it how it generally organise itself, please raise your hand if you want to ask a question at any time, because we do want to make this a little bit interactive. Please do put your questions in the chat as well as all our speakers will contribute to those those questions see if they can answer them or we'll take them offline. All this information will be made available on the GSMA website. We will distribute to.
The presentation to the registered parties also who's attended this meeting.
So and any questions that don't get answered by the experts that are on me on the call or experts that are needed that we will follow up afterwards as well. So let's get to it. So on the next slide, I'm kicking off with the Open Gateway initiative overview.
And on the next slide.

HC **Henry Calvert**   17:58

I think Telefonica has been a major leader, but we started this initiative probably around about nearly nearly a year ago now.
And we've been looking at how we we've seen the cloud infrastructure being probably the next generational platform by which developers and enterprises are delivering applications and productivities out there in the industry, whether that's in IoT Beta B or the new emerging Web 3.0 capabilities. And we are trying to create a common glue between the cloud infrastructure and the earth networks.

HC **Henry Calvert**   18:38

Yes, networks being the mobile and telecommunications network.
And how do we actually expose network capabilities in the language of code and API that developers and enterprises understand in these cloud native capabilities that are in the cloud applications and services that are provided?

And there are three main actors to provide that northbound, a common northbound technical and commercial interface to the developers from the operators both locally and globally, and also federation of those APIs. So a developer doesn't sort every now and again with a myriad of operators to connect to, they can connect to one operator and have an aggregated based API or an API roaming.

As we like to actually state it, so who are the actors here? So the GSMA, we bring commercial principles and also we're responsible for the Technical East West Bound Federation and I'll mention that in a little bit. We will hear from Camara which is our North Star as they are the public repository for northbound APIs. And we'll hear from TM forum about how do we fulfill, how do we maintain, how do we operate.

HC **Henry Calvert** 20:00

The API's maybe in more heavier channel partners like hyperscalers or service aggregators that already existing out there. I'm thinking twillio synch infobip when we're thinking about that interface also between the operators as well just as much and George will give us an update about that. So on the next slide we've sort of created an MO U by which operators are committing to the framework here and there's two sides of this framework. There's the business framework on the left hand side.

HC **Henry Calvert** 20:31

And GSMA's been doing this for over 35 years. You know, whether it's, uh, international calling, whether it's interconnect, whether it's roaming. So we understand how that, that that needs to be deployed and we're focused on 2 agreements, 1 northbound open service agreement because if the developers getting inconsistent service level agreement and commercial principles, then that's gotta be time to market increases time to market, Open federation agreements. So there can be a wholesale business between operators.

Maybe even hyperscalers and and aggregators are like as well. That's also the the the sort of the East West bound commercial principles are in the Open Federation agreement, the right hand side, the technical April API framework. So in our Mau, we basically said the northbound API are being supplied by the Linux Foundation in particular Camara. So we specified that's the route to go on the East West bound the APIs that's you know the principles will be taken from the GSMA.

And people can actually provide their own solutions as long as they meet the specifications and standardization they that the GSMA provide all the TM forum provide. In that sense, it's also sort of a bit of a change. It's specification by doing not documentation. So a lot of the principles you'll see will be from code repositories or from agile demonstrations of use cases which is one of the principles we're taking today. Next slide.

There are currently. Ohh sorry no, there's a little bit more of detail when you actually read these slides of what the operators are committing to through the MOU. I've mentioned the northbound and the Federation and the overall KPI is that the Open Gateway service offering.

HC **Henry Calvert** 22:22

Operating needs to be provided by at the end of 2023. Launch at least one Camara API and federate at least one Camara API with another operator. So seems very simple in KPI terms. Practically it's quite difficult, but there's been significant progress by operators in launching at least one API nationally or even internationally, and the agreements are pretty much they're ready.

HC **Henry Calvert** 22:53

The last statement to May make is we do this all under the GSMA 35, so it's nondiscriminatory and the industry is very much a part of it. And if any specifications are approved, would be approved by industry bodies, which will meet and see based and Etsy based standardization. Next slide.

Thank you. So at the moment, we have 26 MOU signatories enabling over 50% of mobile connections, think it's near about 54% and we've got about another 25 operators, nearly 30 actually operators wanting join towards the size doesn't matter. It's the fact that we've got top down CEOs driving this into the businesses. So it's not the volume we wanna make sure that there is a substantial drive from a top down.

HC **Henry Calvert** 23:47

Approach because we all on the calls are driving from a bottoms up approach and if the bosses are actually aligned with what we're doing then they will drive it into the industry when we hear about Camara, we'll see that's where the buzz is actually happening and it's brilliant to see that they've got significant numbers. I think Paul Markus has about 1500 people to deal with on the next slide please.

So we're organized like this for the work streams that be the product work streams, the technical workstreams that the business workstreams and then the communications PR workstreams hopefully they're self-explanatory.

HC **Henry Calvert** 24:30

There is obviously, you know from operators point of view what's the roadmap of API, what's the categorization those API from a technical word extreme, there's some alignment around the industry on what needs to be driven technically and then there is the work we're doing in federation which I'll mention in a minute. Then there's the two agreements that have been talking about and how does that business case come together and how do we have more substantial agreements with channel partners as templates.

HC **Henry Calvert** 25:01

For operators to negotiate with the likes of Hyperscalers and aggregators, uh, the communication is about the PR about pushing it out. But you'll see in the top right hand side the open gateway community and that's about understanding the requirements from developers and enterprises. It's about shared casing the outcomes and the demonstrations of use cases. And it's about understanding the early adopter programs of the operators and we'll hear about that from Telefonica and Deutsche Telekom shortly.

On the next slide.

Thank you, olu.

Just from a juice maze perspective, there's three main things that we're doing around Federation. We're we're trying to actually understand the the Federated models and how hyperscalers and operators are linked together.

And there's further work that we've been doing in the technical work stream and also in operator platform group, OPG and OPEC and to the extent that we wanna be able to certify that model. So whilst the northbound API has come out of Camara, we just wanna make sure that they can be Federated and the process by which that that federation is actually happening, which really sort of certifies the APIs in their own right as well. Because if you can't federate the API, it's probably the northbound API probably is inconsistent with the others.

HC **Henry Calvert** 26:19

At this three operator control points, we want to specify identification.

Because of requirement for a nominalization, and also in the identification, can we actually see some routing so people know the destination of where it needs to actually go to? And how do you discover which operators are providing which API services and?

Henry Calvert 26:41

HC But for like for like that to the marketplaces and lastly the GSM a not only will is talking about the specs there but we will deliver this through a proof of concept development when we have a GSMA GitHub repository just as well to do federation and that now has code and it's been contributed by operators and being reviewed by operators at this point in time. So I think the last slide from me is is next and it's just the timeline.

As I said, as I mentioned, we really kicked this off in September last year. Umm, we had a milestone in Barcelona where we we saw, you know, uh all 8 APIs that were demonstrated in some form and and so some operators actually launched. We're in that sort of process about look from our point of view looking around the East, West Federation but also you know to this point to this activity here we're looking at the market sizing what the engagement is of the hyperscalers, how we prioritize how we do we scale.

HC **Henry Calvert** 27:43

And how do we have a developer community engagement and a phase three that we do so by the end of the year, we should have about 25 Federated API across the industry. That's not a hard and fast KPI. It's just sort of a goal. So people actually understand the volume. Some operators will have launched 1, some operators would have would have launched 5 or 6. So it's just in case.

Think what the needs are around the around the world are slightly different, so 25 is where we're heading. So I'm gonna finish there and hand over to Marcus on Camara.

Markus, are you there? Yep. You just appeared.

KM **Kümmerle, Markus** 28:22

I am here. Thank you. Thank you, Henry, and thanks for the opportunity to speak in this round. So I'm Markus Kummerle from Deutsche Telekom. I'm leading the API exposure project within Budget TELECOM, which is called magenta API exposure. But I have a second tab and that's Camara. And that's the reason why I'm here.

HC **Henry Calvert** 28:23

Thank you very much. Mark, over to you.

KM **Kümmerle, Markus** 28:44

I'm happy to see so much people, a lot of you already know, and they know already, Camara. So I can do the beginning very fast. So the wrap up, but I will focus more on the current status and outlook the way forward. So on the next slide you can see why we have initiated Camara together with other operators.

The reason was when we started working on the API and got the first feedback from the customers, they clearly told us we will only use the APIs if we have consistency. So if the APIs are available in all the telecom networks in all the countries we need it for our business.

And that was clear. Only then we as telco can make a scalable business. So that's what's the key requirement. The key driver for Kamara, but also the second one, the simplicity was important. So we are very early learned that it's not a good idea to expose the HELICORE network APIs, the complex APIs with all the cell IDs and slices and all the nice stuff. What's developers because they want to have it easy, easy to consume.

To be fast and for that we need an abstraction layer. A simple easy intent base level.

And then we thought about, yeah, how how we can do it. And yeah, I think today's it's a good idea to start with the code and not with paper. So we decided to start in an open source project to immediately start developing the APIs together with the customers to give them a first draft very early, getting feedback modified and then work together and creating an HIV modern way to create the APIs. So that was the starting idea of.

Now Moran, they've reached out to others. They thought about it's a good idea. And so we, yeah, we launched it in a as an open source project and the Linux Foundation, because that's a good place for open source projects. But the biggest one in that world like Linux and Kubernetes and all that stuff. But we were also happy to have a second sponsor from the beginning. That was the GSMA babe with a clear legal connection. So that's the place where all the operators are and.

KM **Kümmerle, Markus** 31:07

I think that's a very, very good starting point for Camara. We launched it into concede on the next slide on Mobile World Congress 22. We've already 22 partners and yes, in the meantime it is one year. We had had tremendous success. I want to call it.

KM **Kümmerle, Markus** 31:28

Did the numbers are growing and growing and on the next slide you can see it where we are on the moment. So we have already 77 partners who show the logo, but more important is the number of companies who are working income. Mara, we have more than 200, another hundred more which who are invited.

To join and also for the people Henry mentioned, 1500, it's not, it's that 1500, it's 12150, but it's really, really enough. It's day feeling to drive this community, but it shows the great success.

It's the right thing what we are doing. That's a clear confirmation, but also if you look at the pieces which already exist and which you can see on the next slide.

Umm.

And just switch the slide please.

Or you can you. Yeah. Excellent. Yeah. That's that's was too fast.

One bag, please.

Yeah, I think we have some delays and in the video, but no problem.

Already on Mobile World Congress, we have seen I think 18 or 19 showcases in the meantime some more and that's really great that are all showcases.

Productive cases in in a part which are built based on Camara API based on Open Gateway and that's really great from proceed from banking.

A fraud prevention and.

Over over Europe, also cases which spend uh Asia, Europe and US like this music production, a lot of interesting thing you can look on it, they are all available at the camera home page. The link is on the slide here so and that's that shows that we are on the right way. So now let's see where we are what's the current scope of Camara and that's exactly the next slide.

Exactly. So here you can see the scope. So Camara focuses really on the northbound APIs towards end, customers towards developers and end customers and also only of a subset of the APIs. We have three types of APIs towards northbound. We have this service APIs like quality on demand.

KM Kümmerle, Markus 34:03

Then we have service management APIs that are APIs like, yeah, how is the situation in my cell? How is the performance? Then what services are available to improve it and then the end to the measurement again and see what has changed by use of the API. So these two types of APIs are scope of camera and then the third group that are the operating APIs so that the APIs from the telcos to the marketplaces to the aggregators, to the hyperscalers. So like catalog APIs or billing APIs.

And these are out of scope of Camara because they already exist. They dated here in forum APIs and it doesn't make sense to duplicate work, so we limited the scope here to really to the service APIs and the service management APIs and also East West Federation is out of scope of Camara. Henry already mentioned it, it's part of Open Gateway.

KM Kümmerle, Markus 35:07

So in the next slide, we go a little bit deeper into the scope of Kamara.

Umm, so we really focus on the API definition, so that's the clear mandatory part in Camara and a good documentation for this definition that are the important things for Camara. If possible we also want to have the code to implement a transformation function between northbound and southbound that makes sense for.

Well, some APIs like quality on demand where we have a defined softbound the nef the should be defined interfaces for that. It makes sense to have the code that helps new operators to adapt the APIs very very fast.

For some other APIs, it doesn't make sense where we have a property back end, the legacy back end different back ends.

And for that, we don't have to code, so the code is an optional part in camera.

Good. And let's move to the next slide.

Yeah. Where we are now in the moment, so we are on the door from the innovation area to the productive area. So we have the decision to open that networks by the APIs. We have identified the necessity to have standardization and Camara, but now we need two more things. We have to show that we really can make business for that happy that open Gateway helps us with the commercial and the business parts.

So like this business service agreements northbound.

But the second important thing customers are asking us how do you really implement this seamless access between

operators? And for that, it's really good to have open Gateway filling the get gap here by providing the APIs for East, West and also for the business part for the federation agreements. So it's a real good collaboration here between open gateway and camera.

OK. And final slide, I want to show where we are heading for. So yet clear we are looking for more APIs. Currently we have 12 API families, but Henry mentioned it, 2025 is a good target and happy to.

Welcome you APIs and Camara. The second thing you have seen dramatic. We have dramatically grown in the in the last year and so we have to adjust our structure and strengthen our project governance to be a reliant partner towards open gateway and industry.

The Third Point is also very important. We want to have a clear lifecycle management for the API so that we have a transparency. Which API which version is in development and which versions are in production at what? What operator environments that we can actively manage these lifecycle?

And the fourth point, as I mentioned, the federation point, that's a very important thing and also the operate APIs from Team Forum, the collaboration here. So that's how we forward.

So if we are interested in Camara, do if you want to have more information, you can find it on the next slide. You can look at our website, come our projected org or you can also go directly into GitHub, look into different groups, see what they are doing.

Kümmerle, Markus 38:44

See what you can get value out of it where you can value bring value in and if you want to join it's pretty easy on the website you'll find contact page and e-mail address where you can send an e-mail and then you are in. That's a simple thing so you are all welcome and Camara happy to welcome you there and thank you very much. I think we have some time for question and answer after next session but now I want to give back to.

George Glass 39:14

Apply.

Kümmerle, Markus 39:14

To Henry or directly to.
Church.

George Glass 39:19

Thank you. Thank you Marcus and good afternoon. Good morning, good evening, depending where you are in the world. My name George Glass. I'm the CTO at TM forum and I wanna just outline a little bit of the work that we've been doing with Marcus and the team and Henry around Camara and TM forum, API, interworking alongside the Camara APIs.

So on to the next slide ruler. Then just to say what the background is, this is at our TM Forum Board meeting in November, we were approached by some of the board members and they were trying to understand what was the difference or the interactions between TM4 may APIs and Camara APIs and how could they work together.

That's always an interesting challenge for an architect with a background like myself to say brilliant. There's a problem I want to solve, so in the TM forum we thought these little projects called catalysts. They are TM forum, rapid proof of concepts where we can actually trial and test hypothesis theories and actually the way we do it, it's a very much along the lines of what Henry talked about. Yeah, we don't do it by documentation. We do it by development. We build code. We actually build a working demonstration of what's going on and find out what works and what doesn't.

So in November 2022, we actually set out by creating a little project with the objective of demonstrating TM Forum API interworking with Camara API and learning what would actually take to practically manage such an ecosystem.

George Glass 40:48

At that point in time, the only available Camara API that was published was the quality of service on demand or Quad API. So we assembled the team and built a demonstration to showcase that solution that would utilize the Quad API.

The way the forums are Catholics, projects work is that we have a set of champions, normally one or two and then a number of participants, typically three or four. But such was the interest in the work that we're doing on Camara. We had something like 13 champions and seven participants. One of our biggest catalyst ever.

Participating in developing a solution that was gonna be used by real estate agents and they would be using a iPad or or.

Notebook PC to actually create a 3D model and capture a 3D model of a room or so that they could actually incorporate that into the real estate agent brochure that we've been used to sell the property. And as we were developing that application, we would actually learn a lot about the inter working with TM4M APIs and the Camara APIs.

GG **George Glass** 41:58

So if you just look on the next slide, you'll see why our board member was actually asking us about the interworking between the Camara API and the network APIs. That and service APIs that we had in the TM Forum. This is our logical representation of our open digital architecture or ODA, it's a componentized API enabled architecture that actually exposes services in a platform ready manner. And if you look at the lower end of the architecture and sort of domains. A&B this is a typical typical bailiwick of the telco, and we're seeing the telco being delayed with the emergence of the Serv cool the net Co and the Info coupe, and we have been spending the last six or seven years building a set or a suite of APIs all around this space for customer management, product ordering, product catalogs, billing partner on boarding, supplier, on boarding service management, service, order management and so forth.

Whenever we came to the network, though, we tended to stop at the interface between Servco and netco, and we abstracted the network and built it. What we called a set of network as a service API.

I got very, very excited whenever I picked up that actually through the Camara project, the operators and with support from the industry was actually going to start, expose more network services and make available more network services for us to incorporate into the solutions. Our Members were actually taking our APIs, which remember where device designed to cover infrastructure, network and services, they were developer friendly, they were simple to.

Extend. They were deliberately decided, described and designed to minimize the number of API, but to maximize the flexibility of the API payload by making it catalog driven so that you could actually have a flexible API that could carry multiple payloads and our Members then started to expose those services externally. Having used them to transform their organisation internally and get digital efficiency, they started to look for an opportunity to demonetize them services externally and deliver.

Told digital enablement, some of them built their own platforms and started to expose the API into their own platforms. Others partnered with aggregators or hyperscalers and exposed their APIs to that world, and they could be things like identification, billing API, charging API, and so forth. Those API that were in the platform with an available either to their own solution providers if it's their own platform to build solutions in adjacent vertical industries, particularly around the IoT space.

Smart health, smart manufacturing, smart agriculture or just making those available to specialist partners who would actually develop solutions on their behalf and they would be a participant in an ecosystem.

So if we move on to the next slide, really what you'll actually see is an outline of the the catalyst and the solution that we're building to test out the concept of the Quad API alongside the TM Forum APIs. And this was a a real estate app provider. So we're gonna build a little application for a real estate agent and that would allow a property owner to bring the application into the rooms and to scan the rooms and actually capture a 3D model of their property now.

Whenever you uploaded that model onto the real estate app and then transferred that using the network that was available from the digital service provider operator that then become available to property seekers who could come and browse the app and wander around the room in this 3D model, the problem was.

The the definition of the model and the speed which you can capture. It was dictated by the bandwidth that was available and if you had the opportunity to boost the bandwidth just for the duration of period of time that you're actually capturing the model, that would significantly improve the user's experience of using the application. I'm using the model.

So if we move on to the next slide, what you'll actually see is the little use case that the team put together and built and you can see there's a still image there of the iPad that was being scrolling around the room and capturing the image

and it would come in very pixelated at the start. And whenever you boosted the Quad service, then it would actually fill in very rapidly.

But if you look at steps one through 4, this is all about partner on boarding and bringing the end user to actually, as in as a subscriber to the service provider, setting up the end user to the 5G plans and they've got a 5G data plan. Then on boarding the partner. In this case the real estate application provider needs to be borrowed on to the ecosystem as a partner and then setting up a partner agreement. So that whenever I use the application and boost the service, I will pay the application provider some of the money.

And I'll pay the operator some of the money.

Customer signs up for the service, so you subscribe to the application and I come to use the service and this is where then I do what's called the user eligibility check. I'm really interested to see at this point in time in this location. First of all, is there a 5G service available to me? Second, is that service not congested and can I actually offer a boost on that service? Third, has the user paid for a boost on demand service or I'm going to offer him a one off charge if I'm going to offer them a one off charge, then whenever I present?

GG **George Glass** 47:34

The option for boosting and they select it. I need to actually capture that as effectively as a product order or as an event that I'm gonna charge the user for.

Having done all of that, and at that point in time, I know can actually call the Camara Boost API.

That would boost the service and step 10. I would use the service. I'll capture the image more rapidly and then when I complete using the service, I'll enter into the revenue share where the end user is charged and the revenue is shared between the application provider and the operator.

So if you move on to the next slide, you'll actually see that as we map this out and I've taken the the colour coding from the use case, all of the the partner on boarding the purchase order or the the the customer base ordering the the partner agreement and setting all of that up, all has to happen then before you actually use the service, there's the user eligibility check and potentially the optional product order and then the connectivity boost. If you hit next next next button.

That little little actually build an overlay and this is the lining it with what Markus was describing in term of the camera service APIs, which is the actual connectivity boost.

Then the set of API around the user out of the check and the product order. The Camera Service Management API and if you actually look at the the slide there you can actually see that aloo we've nothing is available in Camara for that. We actually have a set of product offer qualification on product order APIs in the TM Forum that perfectly matched and perfectly deliver that capability and many of our Members have already built such APIs.

Then we've got the APIs around the partner on boarding and partner agreement. Those are the operate APIs. They're not specifically or directly part of Camara, but obviously you need those before you can actually have any partner agreement in places or do any revenue share between partners. And then finally, you've got customer that actually has the application and signs up to the service and also signs up to the 5G service, what they operator and we're trying to work out or they operate APIs, are they part of the Camara service APIs and we will decide that.

In phase two of the catalyst working with the Camara team.

So if you move on to the next slide, what you'll likely see is that we're moving into phase two of the catalyst and we want to test out more of the capabilities of the Camara APIs, but also understand the ecosystem that working in and understanding their requirements that around that ecosystem to actually monetize this and make it available at scale to our Members.

I on and our customers all over the world. So what we're planning to build is what we call a grab and go use case and this is going to be creating a effectively like a store where you would come in and you would be able to lift items off the shelf and the store having registered through your phone for the service and automatically be charged for those items without having to go through it till.

It said we're having some problems with actually setting it up at our event because we the team that provide the cameras and the sensors for the physical.

GG **George Glass** 50:51

Creation of the store have said it takes 2 weeks to train the cameras and you need access to the location for two weeks before the event and we don't have that. So the team are looking at a a a VR variant whereby we'll build helps, headsets will have virtual items sitting in the store. You'll lift the virtual items and we'll translate those into charges that end up in physical delivery of the services and goods to your premises. We'll be using a set of Camara APIs around location, quality of service and demand. The carrier billing API as a minimum.

Hopefully we'll add a few more to it as they become available and there's a whole set of TM Forum API being proposed around the partner on boarding agreement management, product ordering, service qualification, and so forth.

We will be pushing the Camara team to get more of their API's ready to build a richer experience and we will be working collaboratively with the Open Gateway project, the Camara team to actually make the TM Forum APIs available into the operator space so that others can use those APIs and actually make use of them.

As you can see, though, the the teams involved in the catalyst for phase two has grown two greater than we were already, and if anybody here would be interested in taking part in that, we'd love to have you on board. Please just drop me an e-mail and we can get you in touch with Catalyst Team and we can get you involved on that as well.

Today we have just published a detailed technical report from the catalyst that actually looks at the complexities of mixing TM forum APIs. Camara APIs, the sorts of issues that members of the TM Forum members of the Camara team, GSMA as they build. These solutions are likely to encounter and hopefully many answers to those problems folder, resolve them or open issues and challenges that will be picked up under the various governance bodies that Henry.

Mid reference to in the early part that document is it's an IG1318, it's TM Forum and Camara API for telco standardized service exposure. It should be available publicly on our website and I released that wasn't available this morning. During the call. I'm working my team to get it actually on our website today. So as you can download it, if anybody has any issues, we'll try and get the URL for that embedded into the slide deck and they're available after the call.

But on my final slide then just I, I'm sharing some of the learnings and again this will be available where we actually were able to show how the TM Forum API could form the operate ministration and management APIs for Camara and many of the guidelines that we use for abstraction and simplification of APIs from the TM Forum actually meet Camara's target targets for best serving application developers.

We are all there in some cases identified where you can take a TM Forum API and you can actually build a composite API on top of that. Calling multiple other APIs to simplify the experience from developers perspective, but continue to use the rich set of APIs that you've already built to internally digitally transform your organization and it's very elegant way of actually exposing it as a service management API meeting Camara standards. There are still some challenges.

That we have a concept called domain context specialization and the TM Forum that allows us to effectively in a particular use case or particular scenario, create the API with what appears to be like a effect fixed payload and that makes it simpler from times for users to adopt the API. But it does. You have to be careful that you don't compromise the flexibility of your architecture moving forward, so a lot of lessons to be learned, a lot of that's covered in, as I said, the technical report that we published today and that's available publicly.

Through our website, hopefully I'll give you a little bit of a feel of a deep dive that we did from the TM forum perspective and many of the people on this call and certainly many of the the the the 25, I think the 5th, not all of the 20s, twenty six, sorry Henry. Another one signed today.

Uh, same signatories on the MOU are all already TM Forum members and and therefore we want to make sure that what we're doing is actually complementary to the API that we've already been building as part of the industry standards developed with the TM Forum. So at this point in time, I'd like to thank you for your time today and I'll hand back to Henry because I think we're gonna have a short Q&A section if there's any questions.

HC **Henry Calvert** 55:25

Yeah. Thank you very much George. And and just to reiterate what you mentioned there will be a White Paper that will either be distributed today or at least by the end of the week, which is been sort of.

Piled and uh, sort of. In an agreement between the Linux Foundation Camara TM Forum and the GSMA on how we're all

going to work together and and the different roles and responsibilities that people are doing. So hopefully if you ever speak to one of us, you'll get a a clear and similar answer.

HC **Henry Calvert** 56:02

You know, between between us all, we think that it's an initiative to make sure that everyone is can is consistent from the telecommunications industry, N bound to the developers and there have been a, yeah, a few questions. I know you gotta drop off, George, but I think there was well maybe maybe you can answer this with me. There was one question here are any one machine to machine or 1M2M API is considered within the Camara framework for IoT requirements. Maybe Markus, you could chip in as well. Camara is a public repository so it's a it's it's it's about contribution. If you feel there is an API that's gonna get benefit by multiple operators all deploying that operator in the same consistent and scalable fashion, then please reach out to Camara or come through the GSMA and and and one to contribute those APIs. We can only work from contribution.

GG **George Glass** 56:38

And.

HC **Henry Calvert** 57:06

I'd Marcus. Do you wanna say anything about that question? And and George, is there any activity in Team forum around IT? API, I'm sure there is Marcus.

KM **Kümmerle, Markus** 57:14

So I can completely confirm. So this scope of Kamara is Telco API and that also includes IoT.

GG **George Glass** 57:15

OK. Thank you.
On from our perspective, anry, whenever we're building IT solutions I showed you that platform, there we go into that platform there and TM Forum API sit alongside 1M2M API in the IT solutions that are members are building. So yeah, absolutely they're fine. If they're there, we don't object to them at all from the TM forum perspective.

HC **Henry Calvert** 57:45

Great. And there was one of the thanks you. I've just seen it's just came up on my screen. You answered the question Markus, sorry for the delay that so there was one what would be required to support in a southbound by an operator in order to use the existing APIs. So there are many different implementations, some operators have actually built their own due to the transformation they're going through, they've built their own gateway. Obviously there are many providers that could have been within that Gateway.

GG **George Glass** 57:48

Yeah.
I yeah.

HC **Henry Calvert** 58:16

That look to conform the southbound requirements to the northbound activities there are course vendors out there. Ericsson Nokia capture and Icon just just to name you know four that come off the top of the head that also supply into the marketplace.
Marcus or or even Warren. Do you know of any other vendors or gateway sort of providers that you're familiar with?

KM **Kümmerle, Markus** 58:44

No, but that's also the answer which I've provided.

There is no requirement to use the API's. It's depending on the environment of each operator what what he uses. He can build the API, the transformation function by themselves. That's possible.

KM **Kümmerle, Markus** 59:04
But if there is a defined softbound like a NEF and it's three BP, then you can use the code which is in the GitHub repository and that helps us to easily adapt and to easy create the transformation function.

HC **Henry Calvert** 59:18
Thanks. Well, Chris, uh, George, you might have seen this. How is the relation between Surf Co and Neko in tier math with other SDO spokes that are coming from Etsy? 3 GPP, mcneff, scaff, etcetera. Quality of service on demand is also that exposed in their for how does it connect all the quality on demands and all these initiatives?

GG **George Glass** 59:21
That.
Michael.

GG **George Glass** 59:41
Yeah. So from our perspective the the Serve Co net Co is very simple. That's what I said. We have developed our network as a service API and that that NetSuite of network as a service API or things like service inventory, service activation, service monitoring, service assurance. Whenever you then have a product, a catalog driven payload, you would actually say for this service. This is a 5G service or a 3G service or a broadband service. And if you could down below that.
What you actually find is that the operator of that is built that service abstracted API at the lower end of it. Whenever they're talking to the resources will be talking to broadband forum API or to.
And three GPP API. I'm actually I think that comes out quite clearly, Henry and the White Paper, whenever we see the other STD's at the bottom layer exposing their API's up into the Camara domain and that's substracting those services and talking to them on a southbound manner towards those. So we're not gonna try and rewrite or redesign those, we're going to use those APIs to get all of the calls to work. That's an interesting challenge because I see we've got a, a cruise, a quad.
API for Wi-Fi on a core API, the one that we have here, which is effectively for 5G, I would be with whoever the author is. I would like to have calls API that's independent of the technology that's providing the the access that I'm managing the cause on. But that's a conversation that we probably need to have in some of the working groups as to how we actually model that and manage that. But at this stage that we can abstract it and we can get at the different clauses depending on the network technologies.

HC **Henry Calvert** 1:01:25
Thank you very much, George. I think we're gonna move on to the next section as as time is pushing on. I've just looked at the clock and just gone. We're we're we're getting close. Do you wanna just pop what back one slide and just mentioned before in the deck, you'll be able to see. We've now been able to actually say, right, OK, this is where you can actually find that White paper George has just talked about and the White Paper, there's an alignment across everyone.

HC **Henry Calvert** 1:01:49
Umm, there are two questions, ones there for you, George, if you can answer it from Hassam and I'll get to Babu in a minute on that question. But let's move to the use cases which is you know how are these APIs actually being used, what's the value that they're actually creating? And 1st off we have Warren from Deutsch not Deutsche Telecom. Telefonica knew I'd get that wrong.
For Telefonica to take us through what's happening?
Making open gateway happen. Thanks a lot Warren.

WB **WARREN TRAVIS BOWERS** 1:02:22

Thanks Henry and Marcus and Julia as well for that sort of introduction and that's that kick off to the initiative with Camara and Open Gateway. Hello to everyone. I'll just introduce myself quickly. I am Warren Bowers. I am a commercial marketing manager for the Ghost Market Team, Open Gateway Telefonica. So if we move to the next slide only.
Umm. I'm gonna be talking about Telefonica S attendance at the Mobile World Congress in Barcelona this year, as well as where we currently are and where we want to go.
Umm, so it's a quick introduction. We were able to signal our strong backing of this initiative with the Telefonica and current GSMA chairman Jose Maria Alvarez introducing Open gateway in the keynote opening session on the first day of the event. And then we also had others such as Chema, Alonso, David, Deval, Mark Evans taking part in a number of different talks and Q and as that enabled us to introduce the initiative as well as share our use cases.

WB **WARREN TRAVIS BOWERS** 1:03:28

Some of which I'll share with you today.
It's fun.
Uh, Telefonica, number of key objectives at this event in order to highlight the potential.

WB **WARREN TRAVIS BOWERS** 1:03:39

Uh, and also to create engagement with the developer community.
Uh, first, we wanted to introduce open Gateway's the collaborative initiative gonna telcos at Tech Partners alongside the likes of Camara and TM Forum, and secondly, to showcase the powerful real life use cases, the Open Gateway APIs can enable across different verticals.
To demonstrate that we are Co creating APIs with customers with a developer first approach, we want the experience of developers to be as stress free as possible.

WB **WARREN TRAVIS BOWERS** 1:04:15

But the last one there to introduce or present our earlier doctor's program, which is there to mobilize the developer community and to expose them to network capabilities that we at Telefonica can provide.
It's only this slide gives you a bit of a visual pattern for open gateway stand. Looked at the event as you can see we had it spins different areas, one focused on videos of use cases that weren't necessarily interactive ones.
And then we had interactive demos and decide that. And finally an area that let us introduce the earlier doctor's program at the Congress to to developers.
So if we now look at the specific use cases that we presented and I'll also give a very quick overview of the current open gate Open gateway APIs that were involved and are also available today.
We already have 8 advanced APIs available in Telefonica Group and Gateway.
Uh, those being device status, quality on demand for mobile checkout or carrier billing device location, quality on demand for Wi-Fi as George was saying, separate from the QD mobile number verification SIM swap and SMS based authentication. But for us this is just the start and we'll be launching many more before the end of the year, which is gonna expose a lot more network capabilities.
Umm this is the for the first use case I'll speak about today, but as you'll be able to see as we go through these.

WB **WARREN TRAVIS BOWERS** 1:05:57

They each use case encompasses differing industries, each having different needs.
And that just demonstrates the flexibility of the API as well as the very real world applications. This first one utilizes the device location API and which has become key for fintech companies and whatever institution requires anti fraud measures. And would this use case was with a respective Brazilian bank called Banco Davar who were looking for ways to prevent fraud during transactions.

Especially when they these transactions requests were coming from unknown locations.

Umm and the a key way in addressing this issue is to be able to verify users location very accurately and very quickly we were able to deploy this alongside our Brazilian partners, Telefonica Vivo.

In this case, our network is verifying the location of the device that is being used by the customer and confirming that they are indeed where they say they are.

This means the bank has validated the location of their customers in real time with high accuracy, making transactions more secure.

Uh Gaming entertainment is another very important vertical for us, and this use case here is with black nut who are cloud gaming service which we carried out with Vonage, who are one of our tech partners.

A typical problem, which I'm sure a lot of you know with online gaming, is that there needs to be a steady connectivity that can be relied on.

Umm and Gaming cloud gaming providers such as black nut are looking for ways to get rid of buffering lag and for the users during their game play. The quality on demand API here in this instance is key to ensure gamers can expect no dropping connectivity super fast response times, ultra low latency and in general are consistent and superior experience. The quality on demand demand API in particular allows the application to request a level of quality for its traffic flows, and then the network fulfills this request, offering an improved level of quality.

My not the at the Mobile World Congress, we were able to showcase video feed side by side for attendees to see the difference of the quality with and without this API deployed.

Here's another use case that makes use of the same the same API.

But here it's serving live video communications, which is obviously is another industry that can benefit immensely from these network capabilities being opened up.

Once again with our partners at Vonage, uh, we were able to help zoom, help them explore ways that they could improve the virtual education experience using their technology. But we this we had to we were trying to do this by ensuring the quality of the video feed from the teacher or the host. It being an educational product. But then there's the didn't drop below a certain level.

So the implementation of the quality undermined API enables hosts or classes, hosts of classes sorry or webinars to have a specific HD mode and this was to ensure the quality of presentations or classes and to stabilize connectivity.

Umm here we have sinfo.

Uh, they are an AI company, but also focus on video technologies, productions and 5G.

Uh, one of their AI solutions in particular, requires a consistent and high level connectivity.

Uh, that's because the solution supports high quality broadcasting, which is been especially built for live events and live sports events.

WB   **WARREN TRAVIS BOWERS**   1:10:08

Using AI as a key driver of that in partnership here with AWS, our quality on Demand API was used so the application could call for a higher quality and level of traffic and Telefonica's network capabilities were able to then enable this. Umm, in this specific case it was at a beach volleyball game and the solution needed to process the frames at the correct frame per second rate and during the live event, which ultimately led to a live sports broadcast captured using AI. But there was no video freeze, no pixel or frame loss either.

WB   **WARREN TRAVIS BOWERS**   1:10:55

It's not only thank you and he's never example of my gaming and entertainment use case.

Um.

We, the canto, is a karaoke app which sits within Mobistar pluses TV living app section in Spain.

And here we have an instance of ours integrating the checkout or carrier billing API.

Which is there to simplify how customers charged for a service.

Again, a common common issue is often a sticking point for app providers as the payment processes are often long winded and result in users losing patience and maybe in the end not even buying the service. So companies like Canto

require a payment system and a formal a former payment which is directly integrated into the TV ecosystem and one that doesn't ruin the experience of the TV viewing.

WB   **WARREN TRAVIS BOWERS**   1:11:50

Umm the ditional requirements are the solution needs to be safe and in terms of privacy, quick and easy and in this use case the check out API adds to the charges of any service to the customers phone bill.

WB   **WARREN TRAVIS BOWERS**   1:12:04

And doesn't require the customer to MTN a card details at all.
As a result, companies like Cantu can use the checkout API to maximize their conversion rate, as now users are more likely to complete a transaction that they've called for.
Uh, this final use case.
Really is straight to the power of these API in my opinion.
Umm, it's a highlights yet another vertical which in this is health and Wellness.
Uh, this was implemented with a further partner, Microsoft Azure, and involved a medical software platform for my Poplar called Polo Medicine.
If I first explained what the product does, it's able to take real world patient scans and then it constructs a volumetric 3D image and this image can be viewed by a doctor or medical professional just using the HoloLens from Microsoft in augmented or mixed reality.
Um, just just like many of the other use cases, the software requires a very, very reliable connection, and as the software needs to render the volumetric 3D model often they they need to do this with a time constraint. In this kind of medical setting.
So once again, with the QRD mobile API.
We were able to ensure stable latency and bandwidth to the. We could guarantee the quality of the rendering and that the final 3D image was the best resolution possible and also there was no freezing and most importantly a short shorter rendering time.
And as I mentioned in the beginning, we have 8 current API.
They're currently available, but we are going to be launching a lot more alongside our telco partners and with the camera as time goes on.
And with these current APIs and the future APIs, there are numerous possible use cases across many different verticals.
Um, these are these open gateway API. Have you know enable developers to create services and solutions that would have otherwise been very difficult to achieve?
Without access to those or to these network capabilities.
So if we're talking examples here and in the area of Antiforda Fintech, we can have smarter banks that are more customer centric and gaming and entertainment. There will be new content possibilities for high capacity gaming experiences.
Communication services can rely on an uninterrupted content feeds and also improve their online services.
In industry, these AP, I mean that we can capitalize on the AI capabilities that we're seeing in the market today and possibly even rethink industry norms in terms of processes and workflows and in health and Wellness, patient care can now be prioritised, which ultimately with the result of the healthier population and looked more cared for population.
Umm, but this is not open. This is obviously not an exhaustive list. Um, these are just some of the areas that match with the use cases you've seen today. There are endless there are endless more.
One of our key objectives that I mentioned at the beginning at the Mobile World Congress for us was to invite developers to become part of our earlier doctor's program.
Uh, it's gonna be key. The key thing to the success of this initiative as we need to put these API in the hands of the actual people developing these next generation apps and services.
Excellent. Please only thank you. The IP is there to accelerate developer engagement and it's now live on our production platforms. So we're looking for developers to utilize these API these APIs, sorry. And the ones are currently available and the ones that are coming out soon.

And and this is the follow through with our aim of taking a developer first approach. So that in conjunction with developers we can identify new UK's new use cases and then create a continuous feedback loop for the definition and evolution of open gateway APIs.

WARREN TRAVIS BOWERS   1:16:35

I'm just in key points and features here of the other doctor's program is that it's free to access.
Enables developers to test and validate new cases. The use cases we want developers to experiment. We want them to take our high high performance network capabilities and and run with them.
And from this generate new proof of concepts.
And we provide a full and complete dev kit and developers will always receive full support from the Open Gateway team at Telefonica.
We basically want developers to come to us and say we wanna try these API. We wanna see what they can do for us and for our applications and our solutions.

WARREN TRAVIS BOWERS   1:17:19

Umm here we have a short video. It's the audio, works well and it explains the idea doctor's program and it also touches on some of the future use cases that we believe these open gateway APIs. Can they enable and initiate?

WARREN TRAVIS BOWERS   1:19:06

Umm, so I've routed through that quite quickly and to because you have talked some time constraints, but I've just on this last side, just leave a QR code that will take you straight to the Telefonica open gateways landing page.
And there you can see more about additional use cases as well as, UM, the ones that we've discussed today, which we include videos and information explaining all of them.

WARREN TRAVIS BOWERS   1:19:32

Umm. And also if you want to receive more information regarding each API as well as enroll in the earlier doctor's program. Thank you all very much for your time.

Henry Calvert   1:19:47

Was brilliant, Warren, thank you very much. And now I straight up. Let's have Markus again on Dutch telecoms API exposure.

Kümmerle, Markus   1:19:57

Yeah. Thanks a lot, Warren. Thanks a lot, Henry. UM, yeah. Now I am wearing my my second tab, my DT hat and happy to present what we have done at Deutsche Telekom. So I can show you now this same presentation as Telefonica not in blue but in agenda. So let's little bit focus on different aspects for you. So in the next set, you can see how we have started. So in the early beginning, we first had a look on all the capabilities of the.

Kümmerle, Markus   1:20:27

Network my data, the features of the app and the faces and we found out oh, there is a lot of interesting stuff. We know a lot about the devices, so where the devices are, so that could help to find the drone when it has crashed to find the parts of it and collect it.
Or we know a lot of our networks of the congestion, so we can do some traffic warnings or video adaptations, but we have also very active capabilities that we can influence the data traffic for low latency, for stable bandwidth, log quality on demand and also some things which are interesting for IoT. For the question of Babu. So for example, to wake up devices or set it to sleep.
That enables low energy, its sensors. So it's a lot of interesting stuff and we thought about asking our customers what they think about and they really confirmed that's interesting for them that they it's a good value for them that helps them and even some some mentioned to us that data is the gold of their 21 century. And so we are sitting on a gold

mine. So that was the starting point and was a confirmation to continue with the topic.

And then first, we implemented the first API that was quantity demand in one of our labs in Berlin in a 5G standalone network with an own core with an owned run to do some first tests and we connected it also to a live place to a parking garage in Munich where we have done a first Test together with BMW and you can see on the next slide.

It was a test to remote controller car. We are 5G.

The sensors for that solution, the cameras were in the parking garage and the server was also the parking garage creating the the remote controls and only the remote controls were sending through the 5G networks to the car. That solution was used because that works with all cars which are currently on the road because all they have to feature drive by wire and then that enables a very short term business.

Later on, when we have automatic or autonomous cars, sure, then we can put a logic in the car.

So it was a good case to to test the APIs for first time and we have chosen our location and then in the center of Munich you can see it on the next slide. It was a big parking garage with a big entrance.

So it was for us to perfect location because type public visibility there. But we learned very, very fast that it was not the best location because as you can see on the next slide, the parking garage where are full of that class, so Ferrari, Lamborghini, Bugatti, all nice things and it was not the best place to do a first Test remote controlling a car. And the second reason was we had to drive a little bit outside of that.

Working garage in the public area because we have to turn the car and coming again to the parking garage. It wasn't allowed to do it because it's a it was a test car or test cars from BMW and we learned that directly in opposite of this parking garage was one of the biggest police stations of Munich. So that was the second reason. But all went well. No car was damaged, no policeman was there. We have done a successful test and that you can see on the next slide.

It's only a schematic, but you can see we we hesitate. First car, the blue one. It went well until we brought congestion into the cell and especially the second car, the magenta one. And that gets priority. And then the bandwidth of the first car immediately drops down and then let that the car was stopped. So and that convinced also BMW. That is APIs are real value. They don't want to have cars driving like a frog.

KM **Kümmerle, Markus** 1:24:42

Uh. Happening like, like a frog. That's not a user experience BMW was wants to have his in customers and so they were convinced that these APIs are the right way. And by the way, BMW told us very clearly the only build it in the car if it's available in all the Telekom networks. So in O2, Telefonica and Vodafone for Germany.

And yes, the cars have a better ability that I also drive over borders, so it should also works in France with orange and in Switzerland with Swisscom and in, yeah in Austria and all the countries. So that was the, yeah, one of the starting ideas of Camara. OK, so that was great achievement. And for us it was convincing to continue. And the next step was immediately to go into the live network. So we started to build on the 1st APIs in the live network.

And that work quality demand. So that's really to I've on demand a better latency is stable bandwidth. We have implemented different teacher sizes. So a very small one for only for this remote control where you only have some bits and bytes who are going through the air and then also larger ones for the other use cases. The second API we built was device status.

Or check device UMUM it's in the moment the roaming status, so you can use it for banking transactions. So if a bank gets a big transaction and.

OK. Yeah. The customer tells yes, I am in Germany and the roaming status says no. Then it's better not to do the transaction.

In future, we will improve that API also to the connectivity status and also we've event modeled behind so that you can get a notification if a device is connected or is losing connection. This simple thing customers are asking for.

And yeah, we have it. So in the the third API that is location and you probably know it's not a good idea to provide the exact location of a user device, at least in Europe. So we decided first to build a verified location. So you can put in the GPS coordinates and also radius and get back a yes or no. And this simple thing is a good help for a lot of logistic use cases.

So we have a lot of ask out of the retail industry. Uh, they want to get a notification if the trucks reach the area of the stores that it can prepare to get all the the load.

Kümmerle, Markus 1:27:25

So also very interesting thing and we have done it last year. So we have built this API and the live network in Germany and in the US and by the way also Telefonica and you would Vodafone have built it so happy that we have a complete coverage and the German market which is really key to get customers.

OK. But you also have done a a showcase with CMS energy and first time also with the first hyperscaler with Microsoft. So we've integrated our APIs in the infrastructure of Azure. You can see it and the next slide.

Uh, the component is uh named Microsoft uh Azure Programmable Connectivity SDK and that's a part of the Azure where we've implemented APIs and for that solution their application runs in the Azure and this application then calls the APIs in the SDK.

So to improve the the video of this remote maintenance solution, very good result. You can also see it on the next slide. I do it very quickly because that we have time for question and answer.

It's it's not so good visible in the pictures. It's better in the video.

Without using the API, the video was delayed and is yeah blurred and as soon as we switch it on it's very really really better. So it's a it was a good experience. It was also convincing for Symmons Energy to use the APIs. If you have to follow what we have to follow video you can use the link here on the slide.

Then you can see the better improvement. So and we also have done early access programs like Telefonica.

We have done a little showcases and for that we have 3 laps on the next slide. We can see it. So we have one in Berlin which is based on a Mavenir core. We have one in Krakow which is based on Ericsson core and we have one in Seattle which is based on a Nokia core. And so we are really happy to be able to test the APIs in with all the vendors with all the big ones at least.

And that's a cool, good, good place for our for our laps.

And we have done also a lot of showcases and programs. So you can see we are doing early access programs with hyperscalers, with the big ones, but also with startups and with single developers. We are doing hackathons there. We have open door, everybody can come and we are working on eye level. We want to have the communication from developer to developer that is really key for us. So in the next page you can see the industries, it's nearly the same as Telefonica. So I don't.

Need to code deeper in. Let's immediately go to the to the short video about it that you get an impression of our lab for our program.

Kümmerle, Markus 1:31:23

OK. And I went also mentioned one of the showcases, if we can move on to the next slide that is our Matsuko case, it was a holographic telephony and it is a little bit different from the other ones because it was done.

OK, with two operators but also with more than one API.

So the solution was that application first runs on a server in Slovakia at Matsuko and the one person was in Lyon in France in the lab of Orange, and the second one was in Berlin at the lab of DT. And yeah, we thought doing any improvement you could see the picture of the left side, it's the same here. It's not clearly visible in the pictures, it's better visible than the video. So you can watch the video and see the better.

Laugh comparison and then we we moved the application server from Slovakia to the edge cloud in Berlin and also activated the by the edge cloud APIs of Orange.

And also activated then the quality on demand, we are the quality on demand APIs in both networks and it had the the difference was very significantly.

Yeah. What is interesting thing just to to show one and then finally the last slide, our way forward, yes, we are happy to work on a new APIs. The current ones are for us only a starting point. We are in talks with customers to get the real demand to build their the APIs following the demand of the customers voice and we do it all in Camara. But also the second point, it's important that we now go to the productization that we have first revenues.

Kümmerle, Markus 1:33:10

First business for that it's good to have the support of Gateway here and also the last point. So the answer to how we do

the the similar success, so you're working in the API Federation also together with Open Gateway.

So that's our way forward. Hopefully it was interesting for you. Now let's immediately switch to the Q&A. We have only a couple of minutes left.

HC **Henry Calvert** 1:33:37

Nicely done, both Lauren and Marcus for getting his back on time and giving his 8 minutes for any questions.

So please ask any questions.

Either on chat or directly to ourselves by raising your hand and give you an example.

There we go.

Raise your hand on the top of the screen there. So do you. Do we have any questions from the audience?

Just give you one last opportunity.

Well, thank you very much for all joining. And as Lucy says in the chat, we'll be sending out the slides and the recording of the call in the next day or so to to all participants and it will also be up on the GSMA website and I'm sure it'll be syndicated as well on Camara and also team forum.

Umm, so thank you very much everyone for listening. Thank you very much, Warren. Thank you very much. Markus also thank you very much to George. Hopefully you can actually see the industry. It's very aligned and very excited about all the use cases that these APIs are going to be able to provide developers out there. Thank you very much. I'll move to pose the meeting there. Bye bye.