HIT Standards Committee
Clinical Operations Workgroup
Transcript
June 14, 2013 Web Meeting

Presentation

MacKenzie Robertson – Office of the National Coordinator
Thank you. Good morning, everybody. This is MacKenzie Robertson is the Office of the National Coordinator for Health IT. This is a meeting of the HIT Standards Committee's Clinical Operations Workgroup. This is a public call, and there is time for public comment on the agenda. The call is also being recorded and transcribed, so please make sure you identify yourself when speaking. I'll now go through the roll call. Jamie Ferguson?

James Ferguson – Kaiser Permanente
Present.

MacKenzie Robertson – Office of the National Coordinator
Thanks, Jamie. John Halamka?

John Halamka – Beth Israel Deaconess Medical Center
Here.

MacKenzie Robertson – Office of the National Coordinator
Thanks, John. Donald Bechtel? Chris Chute? Jeremy Delinsky? Floyd Eisenberg?

Floyd Eisenberg – Independent Consultant
Here.

MacKenzie Robertson – Office of the National Coordinator
Thanks, Floyd. Martin Harris? Stanley Huff? Kevin Hutchinson? Liz Johnson? John Klimek? Becky Kush? Kim Nolen?

Kim Nolen – Pfizer, Inc.
Here.

MacKenzie Robertson – Office of the National Coordinator
Thanks, Kim. Marjorie Rallins? Wes Rishel? Cris Ross? Joyce Sensmeier? Dan Vreeman?

Dan Vreeman – Regenstrief Institute
Here.

MacKenzie Robertson – Office of the National Coordinator
Thanks, Dan. Jay Crowley? Marjorie Greenberg? Clem McDonald?

Clem McDonald – National Library of Medicine
Here.

MacKenzie Robertson – Office of the National Coordinator
Thanks, Clem. Nancy Orvis? Terrie Reed?

Terrie Reed – FDA/HHS
Here.

MacKenzie Robertson – Office of the National Coordinator
Thanks, Terrie. Karen Trudel? And any ONC staff members on the line, if you could identify yourselves.

Farah Darbouze – Office of the National Coordinator
This is Farah Darbouze.

MacKenzie Robertson – Office of the National Coordinator
Thanks, Farah. Okay. With that, I will turn the agenda back over to you, Jamie.

James Ferguson – Kaiser Permanente
Great, thanks very much. On the agenda today we wanted to focus primarily on topics around image exchange, and so this is something that is a high priority on the work list item that's been given to this workgroup from the Standards Committee and from ONC. And what I'd like to do is to propose structuring the agenda in a particular way. I think first of all I'd like to ask John Halamka to give us the feedback and discussion that proceeded at the recent Policy Committee, so that we can have an overview of things. And then I'd like to have a brief discussion after that of use cases for image exchange, because in my mind, at least, there are at least three different use cases that we're ultimately trying to solve for, and I'd like to have just perhaps a brief overview discussion, make sure we – we're aligned on the use cases.

Then we have folks from RSNA on the line today who will be briefing us on some of the image exchange activities going on there, and with their membership. And then hopefully we'll have time to come back after that and talk about use cases in more detail. I do want to get to a more detailed discussion of the different use cases that have different requirements for image exchange, but I also want to get to the RSNA image share discussion, so I don't want to – don't want to spend the whole time on the use case. So what I'd like to do is come back to the use cases after that. Does that agenda sound acceptable to everybody?

John Halamka – Beth Israel Deaconess Medical Center
Sounds good.

James Ferguson – Kaiser Permanente
Okay. Then John, I think over to you for the Policy Committee discussion first.

John Halamka – Beth Israel Deaconess Medical Center
So as folks remember from our Standards Committee meetings, we wanted to seek guidance on several of our assignments from the Policy Committee to reduce scope, because when one says share images, what does that mean? And simply, the Policy Committee came back and said get rid of the CDs. And you can imagine, as Jamie suggests, there are several actors; there are several use cases, for which we would have to consider different standards.

But imagine this, that today, a patient goes to get an imaging study, and that patient wants to be the [audio glitch] to another – a provider or another site of care. I asked the question to the Policy Committee, do you want the patient to be able to download of full DICOM objects and multi-megabyte if not gigabyte MRIs? And they said, again, the issue is eliminating the CDs. So if the answer is that, "oh, well, there's a high res and a low res representation of the pixels," that may be a part of your use case. If there is the notion that it goes to the cloud and the patient gets it from a common cloud platform and shares it, which may be part of your use case. If it's the idea that it's pushed from place to place, that may be part of your use case.

So they didn't constrain us in terms of you must use DICOM or you must use high res always. They didn't constrain us in terms of architecture, push, pull, local, host, cloud. They simply said go through the use cases that will eliminate the need to use CDs, and then you will have met our intent for what we want the EHRs and supporting products to do as we think of future stages of meaningful use. So Jamie, back to you.

[Crosstalk]

James Ferguson – Kaiser Permanente
Thanks.

Clem McDonald – National Library of Medicine
___ ___ sounds pretty severe ____. I mean, is the goal really to enable other more – other mechanisms, or to really get rid of CD?

John Halamka – Beth Israel Deaconess Medical Center
Well, so the idea is enable other mechanisms that would get – eliminate the need for CDs. So – and again, I – Jamie will go through use cases, but for example, in Boston, many of the providers in Boston use a cloud-hosted image-sharing service, so that one provider can push an image stack to the cloud, and then another provider can view it on the cloud, or download it into their local image management system from the cloud, and therefore, there is no need for a CD in that particular set of exchanges. That's just one example.

Clem McDonald – National Library of Medicine
Yeah, but the patients love them.

John Halamka – Beth Israel Deaconess Medical Center
Well, okay. Well, we can debate that, but we are an entirely Apple, Macintosh household, and I can tell you that many of the CDs we're handed require specific versions of specific operating system, and they aren't well-loved. But there may be a place where that's not true.

Clem McDonald – National Library of Medicine
Okay. Yeah.

James Ferguson – Kaiser Permanente
So let's get back to – let's go through an overview discussion of different use cases and kind of classify the use cases a little bit. What I'd like to propose is that there are three general use cases that may have different specific scenarios in them that we should seek to solve for in our – in our deliberations. And this is clearly going to take, you know, not just one meeting of this workgroup to consider alternatives.

But even just to develop the use cases, so the first one, as John talked about, is really the provider to patient download capability use case. And so just – really, just a one-way transfer, and the idea is – or at least the initial idea on this one is that, you know, we might have different scenarios, but the patient would be able to download images relative to their care from their provider systems. And, so that could be relevant to both ambulatory and in-patient systems. But – so the provider to patient is sort of use case category one.

Use case category two is really clinician to clinician. So it's – this is about image sharing between individual clinicians who have – both have a treatment relationship with the patient. I think that's pretty clear.

And then the third category is – I like calling it care team sharing. It could also be called network sharing or provider community sharing. There may be other names for it. But this is, as John talked about in the case of Boston, where there's a network or team care capability where all members of the care team of a patient could potentially share images together, not in a one on one mechanism, but in the team-based or network modality.

So does it make sense to have those three categories of use cases, or would folks like to classify these use cases differently?

John Halamka – Beth Israel Deaconess Medical Center
So let me just add, the reason I think that – thinking about the patient needs, you might, as the Policy Committee advised, want to give the patient the option of a low res version, a browser-friendly version that they can simply see, versus a provider-provider exchange, which might always stay in a high res, diagnostic quality format, as an example.

James Ferguson – Kaiser Permanente
So John, I guess from your discussion with the Policy Committee, if we were to classify use cases in those three different areas, and then to develop scenarios that we solve for, would that – I mean, would the three of those use case categories together solve for sort of the spectrum of needs that you see there?

John Halamka – Beth Israel Deaconess Medical Center
Yeah. I mean, I – in my discussions with the Policy Committee, as we talked through some scenarios, what you ended up with is very similar, view, access, download, and transmit where the patient is on the other end, and recognizing that that may be browser-based, and a little bit different than sort of a traditional radiology image exchange standard. Provider to provider more directed exchange, where there are bilateral trading partners and I'm sending it from me to you, and diagnostic quality.

And then kind of – again, I don't want to specify architecture here, but as you suggest, cloud-hosted, teams of people who have access to images where multiple parties may contribute multiple things for multiple people to see. It isn't sort of a directed push.

Clem McDonald – National Library of Medicine
Now could we just clarify, is this just radiology images, or is it eye photos and picture photos and skin photos and – what's the space? _____ –

John Halamka – Beth Israel Deaconess Medical Center
Well, yeah. I mean, the Policy Committee didn't specify modality. You know, that it's – of course, I use things like MRI, CT plain film as an example, but I would think, Jamie, that we would want to ask questions, if it's a pixel, that the mode of representation is not a character, it is a pixel, then these three use cases apply to pixels, need to be thought through.

Clem McDonald – National Library of Medicine
Well, I mean, it sounds [audio glitch] radiology is I'd say [audio glitch].

James Ferguson – Kaiser Permanente
Clem, we're getting a lot of static on your line.

Clem McDonald – National Library of Medicine
Oh, sorry. ____ is good. But in any case, the endoscopies and some of the pathology reports, the pictures are embedded in the report, and they're sent as PDFs. Does that qualify?

John Halamka – Beth Israel Deaconess Medical Center
You know, it's interesting that I could imagine a slide which is a representation of – you know, and pixels being part of this, but I didn't sense, Jamie, that this use case specifically was a multimedia object including text. That is, a report transmission would be a separate set of standards ____ ____ pure pixel representation.

James Ferguson – Kaiser Permanente
I think that's right. I think this – the scope that I think we've been given here is the images, not the report including the images.

Clem McDonald – National Library of Medicine
Well, I mean –

John Halamka – Beth Israel Deaconess Medical Center
So I don't think PDF was really in scope here.

Clem McDonald – National Library of Medicine
____ will be excluded, because they don't do them any other way. They don't send them standalone. Well, many of them don't send them standalone. I guess pathologists have –

James Ferguson – Kaiser Permanente
Well, that – you know, so that may be a scenario for the different use cases, then.

Clem McDonald – National Library of Medicine
I think they should be reminded, because I think they're thinking radiology.

John Halamka – Beth Israel Deaconess Medical Center
And when I think of pixels, I think of radiology, cardiology, OB/GYN, GI, and pathology do – you know, of course does have slide representations, too.

Clem McDonald – National Library of Medicine
Because GI –

John Halamka – Beth Israel Deaconess Medical Center
So there are many "ology's".

Clem McDonald – National Library of Medicine
Yeah, but the GI ones are – at least the ones I know of are all embedded. They take – you know, they send out special pictures. They don't send the whole tunneling _____ – well, I guess they could.

James Ferguson – Kaiser Permanente
Well, I – obviously, you're right about that, Clem, but – so –

[Crosstalk]

James Ferguson – Kaiser Permanente
Let's leave that as a question, a scoping question, for different scenarios, as we go through further use case detail, if that's acceptable. Then we can essentially put that on the – on the follow-up item list, and –

[Crosstalk]

James Ferguson – Kaiser Permanente
– turn it over to our colleagues from RSNA for the next section of the agenda.

[Background voices]

MacKenzie Robertson – Office of the National Coordinator
Sorry. We're just getting a lot of background noise. I don't know if someone can please put their phone on mute.

James Ferguson – Kaiser Permanente
Okay. So then I think we're at the point now, Dr. Carr, where we're ready to get a bit of a debriefing from you on some of the image share activities that are being pursued in RSNA.

Chris Carr – RSNA
Sure. Can you guys hear me okay?

John Halamka – Beth Israel Deaconess Medical Center
Yep.

James Ferguson – Kaiser Permanente
Just fine.

Chris Carr – RSNA
Great. Hello, everyone. I have also on the line Dr. David Avrin from UCSF, and Brad Erickson, Dr. Brad Erickson, from Mayo Clinic, who are participants in the project. And I have some slides as a useful – is there a way I can share a set of our slides?

MacKenzie Robertson – Office of the National Coordinator
If you want slides, you're going to have to email them to me, because I didn't receive anything this morning for a presentation.

Chris Carr – RSNA
Ah, okay. I assumed this was –

[Crosstalk]

Farah Darbouze – Office of the National Coordinator
This is Farah Darbouze. If you email to me, I'll make sure to get them to Roberta, because I know you have my email address.

Chris Carr – RSNA
Yep. I will do that immediately here.

James Ferguson – Kaiser Permanente
Okay. So it'll probably take just a few minutes to get the slides up, then.

Chris Carr – RSNA
Yeah. Yeah. Sorry about that.

MacKenzie Robertson – Office of the National Coordinator
Hey, Farah, make sure you send them to me. I'm not sure who Roberta is.

Farah Darbouze – Office of the National Coordinator
I'm sorry. It's a ____ to your email is Robertson. That's why –

[Crosstalk]

MacKenzie Robertson – Office of the National Coordinator
So it will take just a minute to load them up. I don't know if you just want to just begin speaking through your presentation. We'll be working in the background to have them uploaded into the webinar, but it will take a few minutes.

Chris Carr – RSNA
I just got them off to you, Farah, so yeah, I can start. And if Dr. Avrin and Erickson are enabled to speak, I hope they will fill in.

So the Image Share Project is an NIBIB-funded project. It was an initial two-year period of funding that began in October 2009. We're now in a second phase that started four years of funding. There was a kind of gap year there, but we started funding the second phase in October 2012. RSNA is the prime contractor. We're working with six primary institutions who are kind of both the researchers and developers for some of the software work that's done as part of the project. Currently, the network – oh, and we're also working with about four vendors, four industry vendors, primarily, ___ ____.

It's deployed – the network is deployed currently at 7 sites, and there are now 28 sites in the deployment pipeline at various stages, and those are starting to come online. So we've expanded from the initial five to two in the past few weeks, and there's a large pool of additional sites joining in.

So the rationale for the project I think is probably obvious, and it sounds like it's very much aligned with the thinking of this group, that, you know, obviously, medical imaging, high value, high cost service, rapidly expanding. Sharing via CDs is – has all sorts of inefficiencies and frustrations. It's expedient in some ways, but often painful, especially on the receiving end. And studies have shown that there are significant rates of redundant imaging procedures ordered and performed because the priors are inaccessible.

And patient empowerment is obviously one of the key goals of the current federal initiatives in the US. This project is for patient-controlled sharing of medical images via the internet. And it is based on standards using – it uses the IHE XDS family of standards for image sharing, and adapts those for a patient-controlled model. And when we say patient-controlled, it sounds like it's really the use case category one that you described earlier, provider to patient exchange of images.

So the information is shared directly with the patient, who controls all subsequent access to the images. It includes images and reports. It uses personal health record accounts, so [audio glitch] established accounts with the participating vendors and the participating sites are able to forward their image studies with reports to those accounts. There's no unencrypted patient information accessible in the network, and the security key is provided to the patient, so the ability to retrieve into a PHR account is provided directly to the patient. And so, you know, all the PHI is in patient custody throughout.

There are pictures of the network, but basically, it's designed to enable sites to attach. So we've created software, open source, free software based on standards, and some open source components that were available to us that links the local risk and PAC systems to this network. And the network includes really just an XDS registry and repository that's provided in this project by Life Image, a commercial vendor that acts as the touch point for all the participating sites and the participating PHRs. So all the security exchanges between sites and the – we call it the image clearinghouse, but as I said, it's an XDS registry repository. Sites exchange their security certificates and send data to the registry repository, and PHRs retrieve from that same touch point.

I'm getting some – I don't know if others are hearing, but there's some background noise coming in. Sounds like somebody's – I don't know.

MacKenzie Robertson – Office of the National Coordinator
I'll just ask again – this is MacKenzie. Can everyone please make sure, if you're not currently speaking, to mute your lines? Thank you.

Chris Carr – RSNA
And if you'd let me know if the slides are available, there are a couple of pictures that might be useful.

James Ferguson – Kaiser Permanente
Can we plan on getting those sent to us afterwards, regardless of the success now?

MacKenzie Robertson – Office of the National Coordinator
Yes. They'll be distributed to the entire workgroup, and the folks running the webinar have the slides. They're uploading them as – they're working on it right now.

Chris Carr – RSNA
Okay. And again, apologies that I was not aware it needed to be shared in advance. But – so just – I'll talk two more minutes about the process of doing this. So each site has what – this device we call an edge server, which has a browser interface that listens for completed reports, and keeps a database of all the completed reports, and then links those with the imaging studies in the PACs, creates a kind of secure package of that data for each patient, and providers a kind of work list interface, browser-based work list interface, for an operator at the site, typically like an image room file clerk, but it really could be anyone with access to the browser.

And they are able to see – to search for patients using the patient name or medical record number, select the studies that patient has had that they want to send to the clearinghouse, and go ahead and push them up there. They then – sorry – allow the patient to create a password, and they create a printout that they give the patient that contains that password, and then a security key that's generated by the system. And the patient uses that information. They're also given materials, printed materials, about the participating PHRs, and it's on the patient, the patient's responsibility, to create the ____, create a PHR account, and retrieve this – their image study into that account.

These are image-enabled PHR systems. They have sort of simplified diagnostic quality viewers that the patients can use to look at the images, and they can also provide access to their account via an email key. So, each of these PHR providers has this ability to sort of confer access from the patient to another provider. And the provider on that end can access the images, again, using this viewer that the PHR providers have built into their systems.

The – all the images that are used are DICOM images. There was discussion earlier about the image types. I hesitate to say that it – all IODs are – DICOM IODs are covered. It really kind of depends on the capabilities of the viewer. But at least in principle, all kinds of DICOM images can be exchanged on the network.

Just as a kind of snapshot, currently, there are – just shy of 4,000 patients have enrolled in the system and used it. About – a little over 15,000 exams have been sent through the clearinghouse, which is, you know, about 3.5 exams per patient. And the patient utilization, so the number of patients who convert – you know, create a PHR account and retrieve their studies is about 40 percent of those enrolled. So that gives you some idea of the current scope.

As I said, the number of sites is expanding, so we anticipate the rate of patient use of the system will expand pretty dramatically over the next year.

MacKenzie Robertson – Office of the National Coordinator
Dr. Carr, this is MacKenzie. The slides are up, so I don't know if you want to go – tell them what slide to go to.

Chris Carr – RSNA
Yeah. Sure. Let me return to the proper window here. I don't – I think if you skip ahead to maybe – I'm just looking at my local at the same time. Sorry. (Slide 13) Let's see. No, back up a couple more. Sorry. I think we need to back up one more. You know this – maybe we can – I'll just start from here.

So that's – this is just a view of the – what the browser interface looks like. If you want to go ahead, here's what the kind of patient work list looks like. There's a sort of shopping cart model, where the site staff add the patient's studies to a submission set, which is, you know, kind of analogous to an Amazon shopping cart. And that is the data package that gets sent to the clearinghouse. Go ahead.

This is what the security printout looks like. The token is the key that's generated by the system. It's an arbitrary number that's created by a hash of values, and the patient actually selects their password, and the patient records his or her password on this printout that they take with them to use in registering, retrieving their studies. Go ahead.

This is what one of the PHR viewers – I think this is Dell's – looks like. Go ahead again. This is the display of a report. I think I mentioned it, but the submission set, the data the patient has access to, includes the full DICOM image set and the report. And go ahead.

So the stats I mentioned already. You can go ahead again. So we've created a help desk for patients, and have been tracking patient questions and concerns, and have a kind of FAQ of, you know, patient support. And also, all the sites that are linked in, we provide training and help in deployment and getting the site personnel prepared to use the edge server device to enroll patients in the network. And go ahead.

This is some animation here. Sorry. It just – those were the patient materials that we provide; and then just some links here to general information. The code is available on GetHub, and the releases both – of the edge server are available through the RSNA image share – RSNA.org site, the image share page there. And there's more information there for patients, for providers, and for developers as well. And oh, just incidentally, we do, do annual demonstrations of this event at the RSNA meeting – demonstrations of the network. That may be the last slide.

Oh, future plans. That's important. So there are – now actually I think 28 is the proper number of sites that are at some level of – from indicating their interest to actually having systems installed and doing the initial deployment testing, there are now 28 sites in the process of deploying. A new version of the edge server software starts to move us into kind of your category two of use cases, provider to provider use cases. It enables the retrieve capability at the edge server as well. So in addition to the PHR systems being able to pull images down from the clearinghouse, the edge server itself now can do the same thing, so that the participating sites can retrieve information and import it into their clinical systems.

The keys, the kind of security information required to do that, is communicated through other means at this point. So there has to be some mechanism of exchange for sending the security code from one site to another in order to enable that retrieval. There is also capability to anonymize studies built into the edge server, to send those to the clearinghouse with a special clinical trials key that's shared among the sites in a multi-site imaging clinical trial, and to retrieve that data into a clinical trials data repository. So this version 3.0 of the edge server which was just released in the last couple of weeks has those additional capabilities.

And it's – we're on a path to really addressing I think all three categories of the – of image exchange that you described earlier. Three dots oh move us to – into the category two. But the architecture that this network is based on, the XDS architecture, is really designed for, you know, a network of trust, an affinity domain, as they call it in IT, for a kind of health information exchange model in which access to all kinds of patient information, in our case including images and reports, would be available to providers within that network of trust. So, you know, we made that decision to use those standards with the intention of being able to address that full set of use cases.

So that's probably enough from me. I don't know if Dr. Avrin or Dr. Erickson have anything that they want to add to that from a clinician's point of view, or anything I left out they want to mention.

David Avrin – RSNA
Can you hear me, Chris?

Chris Carr – RSNA
Yep.

David Avrin – RSNA
Okay. So I think there are two important points to make. One is that this area of, you know, secure exchange over the internet is an area of commercial interest by some vendors, for obvious reasons. And one of the purposes of this project is to make sure that all of the vendors are using – for this demonstration project are using an open standard, because we don't want to – we want it to be similar to DICOM, where every imaging device in the world, medical imaging device, produces images according to a known format with a known communication protocol. We don't want this to be Balkanized and siloed.

The second issue is – Brad can pipe in after me – is that a significant portion of the software efforts for this project revolved around identifying and authenticating the patient, which would be a lot easier if we had a national identifier. So I'll let Brad add to that.

Brad Erickson – Mayo Clinic
Yeah, I think that's true. And, you know, I think I would make a couple of comments. You know, in terms of the use cases, what's described, you know, in terms of provider to patient really is a communications channel, but the real use is that patients usually don't want to review and interpret the images themselves. Usually, they want to pass those on to some other provider that they think that they want to consult with.

And as an institution that receives a large number of CDs, we often also do further post-processing. So for instance, a patient comes in with a liver CT and they have metastases, and we then do measurements on the liver to determine therapeutic options. And so from that perspective, having the additional information that's available in DICOM is critical to avoiding the need to rescan the patient and get things like spatial information and intensity information that the jpeg tends to strip out.

So I think, you know, understanding a little bit more of the use case, how a patient would use the information, is critical to getting that problem solved correctly. And then as Dave said, you know, the provider to provider problem is a – something that we're just addressing now, and I think is an important one. I think the third one, the care team sharing, is interesting, and, you know, I guess I would have scoped that as an enterprise problem, and not something that I typically would have thought of as a CD or image interchange problem. So I guess I would want to understand that one a little bit more before I could say that we do or don't address that.

James Ferguson – Kaiser Permanente
Well, thanks very much. So this is Jamie Ferguson. I'll just come back on that last question of yours. I think part of the thinking there is that, for example, in the accountable care organization model, where there may be multiple practices in different provider organizations, both ambulatory and inpatient, that are – that are caring for a patient, really working together as a team. I think that's sort of the model of information sharing that the third category was intended to cover.

Brad Erickson – Mayo Clinic
Yeah. I think that makes sense. You know, I'm trying to think how the whole HIPAA compliance – it seems like all the members would have to log in and be identifiable to some system, and then that would have to create some sort of a log of who accessed the system. And to me, it seems like if it's an accountable care organization, that that organization should be able to step up and address that need that – I just see that that could be a real complex problem to solve, and I'm not saying not to do it, but it just seems like that's way more complex and potentially less beneficial than the other two use cases that you identified.

James Ferguson – Kaiser Permanente
Yeah. Well, I guess, of course, that could also alternatively be solved by – simply by them joining the same affinity domain, as you call it here, or the same – the same sharing network, so that they could have that kind of retrieval access, subject to the data use agreements, I guess.

Clem McDonald – National Library of Medicine
It seems exactly parallel to IHE that this is intended for. Health information – HIE, I mean, health information exchange.

James Ferguson – Kaiser Permanente
Right.

John Halamka – Beth Israel Deaconess Medical Center
So Jamie, two questions ____, and that is to just ask our experts, as we define these use cases, you've highlighted that primarily DICOM image exchange is really what we need, because even though the patient is involved as the steward of the data, the patient isn't really doing an interpretation. They're really the facilitator of it going from place to place, or its disclosure.

However, there is probably the use case of, oh, this is my fracture. I want to show my family members. Or this is the jpeg that, you know, immortalized whatever it is that I had or was done to me, and I want to persist that in a way that a browser can simply open, not a DICOM reader. And so I – one thing the Policy Committee said, and, you know, again, maybe it isn't important that it's not our central image exchange use case, that – might there be a low res option that allows the patient to say, yes, of course, I want the high res DICOM original, but I'd love the thumbnail version that I could share or persist or have more internet standards friendly than DICOM object heavy. So, thoughts from the experts?

David Avrin – RSNA
And so the – you know, CT and MR are actually very low spatial resolution. It's the density resolution that's important. So for a particular view of the abdomen or the chest, it's not hard to automatically generate jpegs from DICOM which are going to be full spatial resolution on a browser, and I think Kaiser does this for some of their patients. For plain radiographs that we capture now directly digital, those are higher spatial resolution, but they have less of a density span problem, and you can also make – you know, they come out 2,000 by 2,000 originally, or 2,500. It's easy to make a very good image at browser resolution. So I think the patient use problem of jpegs is easily handled and fairly trivial.

Chris Carr – RSNA
And I just would add, and this is Chris again, that one of the EHR providers, Life Image, actually has a – I think it's like download, low resolution, or something, function built into the account, so a patient can get images for those kinds of purposes.

Clem McDonald – National Library of Medicine
I'd just like to weigh in on the idea of jpeg, because that's all we use at Indiana, and we had every image in two very large hospitals, and the physicians thought they were fine, because they really – they're the same resolution, and the – every – the information is there. It's just they're compressed. And the question about ____ _____, you know, the average clinician couldn't tell the difference. The radiologists could sometimes.

So I don't think we should think about it as a downgraded version, but I think it should be supported for easier transmission. You save – we save tenfold on a chest x-ray using very high resolution jpeg compression, and – well, maybe a little less on some of the other kinds of images. Maybe it was even more on the chest x-rays.

Brad Erickson – Mayo Clinic
Well, actually, jpeg is used in DICOM as part of the transfer syntax. So we use jpeg compression, or you can pick the transfer syntax, but you can use that, and in fact, the DICOM committee worked with jpeg to support greater than eight bits per pixel for medical imaging purposes.

But, you know, if all you're doing is looking at the image, then it might be acceptable. But if we're going to start to do quantitation or measurements on images, you know, read formats and surgical planning, then jpeg isn't sufficient.

Clem McDonald – National Library of Medicine
No, and there's no disagreement on that. It's just that I – for the patients, both the size and transmission times, there'd be a huge advantage to jpeg. And if – that patient focus, I would still make sure jpeg could be used very easily.

David Avrin – RSNA
I think – I think it's easy to bifurcate that. For institution to institution, like we accept any patients' images into our PACs, foreign sources, but it's important to have it in DICOM to – for all of our analysis tools and ____ level, and have it in our regular workflow. But it's easy to bifurcate, provide the patients with a web browser – web viewable jpeg version of some sort.

Clem McDonald – National Library of Medicine
You can actually ____ and level the compressed jpegs ____ 12 bits compression and you do –

David Avrin – RSNA
Some jpegs.

Clem McDonald – National Library of Medicine
Yes.

James Ferguson – Kaiser Permanente
I think we should take that offline.

David Avrin – RSNA
Sure.

James Ferguson – Kaiser Permanente
That's kind of a technical issue beyond the scope of today's discussion.

John Halamka – Beth Israel Deaconess Medical Center
Right, and Jamie, my second question, which is in reference to our use cases, is imagine – let me just use the Massachusetts Health Information Exchange as an example. Its notion for our pull technology is to have a master patient index –

James Ferguson – Kaiser Permanente
Yeah.

John Halamka – Beth Israel Deaconess Medical Center
– who is the patient, and of course, as people said, that's hard, and then a registry of sorts, a record locator service that tells us where records are, as well as a consent to disclose flag. So the question that was raised about, well, what about the security and patient consent and all the rest, within your model three you could imagine a situation where you have not centralized images, but a centralized identity, a centralized registry, and centralized consent to disclose that allow many team members and many organizations to retrieve the object using that metadata.

And I think, as we go through our use cases, you know, I could imagine two architectures, one that's just very registry focused, and the other that actually is a cloud image share that allows from a central storage location the actual image itself to be retrieved. But I think there are mechanisms we could think about to get around the security and consent issues.

David Avrin – RSNA
I was in Kansas City this week, and that geographic area has a very successful health information exchange, which is not image enabled yet, but they've had very little patient complaints regarding security and privacy, but mostly enthusiastic reception.

John Halamka – Beth Israel Deaconess Medical Center
And so the question for the experts is as you look at health image exchanges, especially of the nature that Jamie has described as sort of team focused, are you seeing a tendency to centralize images into a cloud, or centralize metadata into a single location, and then more federate the retrieval of images, as you said, edge servers or other kinds of technologies?

Chris Carr – RSNA
So our approach has been – in this project has been centralized in the sense that, well, this is an XDS rather than an XDS-I implementation, meaning that the submission set contains the image data. So when you register a patient exam, you send that patient exam and it gets stored, in our case temporarily, by this registry repository in the cloud, if you will.

The architecture is, again, compatible with a federated retrieval model, and that's how the XDS-I profile, as you may know, is – was designed, so that images are retrieved at the time of need from the source, meaning the – presumably the PAC system or some repository that sits locally in front of the PAC system and acts as a kind of proxy into the network.

The security constraints of the participating institutions dictated that – excuse me – they did not want to allow any outbound connections from their local radiology systems, from their PACs. So retrieving from some other institutions PACs was not, you know, feasible in the – within the security policies of the participating groups. So that kind of led us to gravitating towards this model, and given that our requirements were to provide, you know, patient controlled image sharing, we interpreted that to mean, you know, this kind of drop off and pick up model, which uses a centralized registry repository.

So, you know, whether that's indicative of how the general trends are going to keep going across the country, I certainly am not qualified to say. I don't know if Dr. Avrin or Dr. Erickson have thoughts about that.

Brad Erickson – Mayo Clinic
I think I would say that it probably is moving more towards the metadata, and another reason to think about is that, you know, when you have more ability to communicate examinations around, it means that we're going to have more ability to have old comparison exams, which are often critical to making good management decisions. And if you now have multiple examinations to compare potentially with multiple series, like with MR or CT, having a web-based viewer where one viewer is in one window and my examination is in my local PACs, becomes a challenge to the efficiency of reviewing all the examinations. So there's a strong advantage or reasons why we would want to import the outside examinations into our local systems rather than keeping all the image data out on the cloud.

Clem McDonald – National Library of Medicine
Can I ask a different question? How – is this now – what's the cost of all this? Is this going to – is this going to – is it a cost to each institution, or is it grant supported, or how is that going to evolve? And is it a commercial system now, or is it a research system?

Chris Carr – RSNA
It's a research system. It is grant – or actually contract supported. But part of the contract is to, you know; evolve a self-sustaining business model around it. And we have engagement from, you know, a set of vendors who are very interested in maintaining this business. Currently, it's free to patients and free to sites to participate, or, you know, there's not a per study or tariff or subscription fee or anything like that.

The – what the model would be going forward still is to be determined. So whether they are, you know, charge the patients or the site would pay to participate in the network that remains to be decided.

Clem McDonald – National Library of Medicine
Well, let me kind of applaud your starting central model, because you can make that work, and you find ___ ___ ____. So I think that's a good way to start it, anyway. And there is a way to get any of the specs on like the connection of PHRs and the rest?

Chris Carr – RSNA
Yes, absolutely. All of the documentation, if you follow the link that's provided in the slides, which I assume will be distributed to the group, the – all of the documentation, you know, linked to the GetHub site that has the source code, a virtual machine version, and an installer version of the edge server, is all available.

Clem McDonald – National Library of Medicine
And one last – just a comment is that you're sending reports and images, and I worry about us ___ committee defining things in terms of independent images only, because it doesn't happen in real life that often. And so if we start partitioning that way, we're not going to come up with as good a solution as if we recognize that they're often blended in different ways.

Brad Erickson – Mayo Clinic
I'm sorry. I didn't catch all that. You're saying that it was important to tie reports –

Clem McDonald – National Library of Medicine
Well, the committee is kind of focused on images alone, and I think that's going to be a mistake, if we don't consider reports and images as – like love and marriage, horse and carriage, they're tied together.

Brad Erickson – Mayo Clinic
Yeah. I agree with you. I agree with you, and, you know, we do expect that reports will be a part of this, and we packaged them together. There are ways that we allow exceptions, like emergency transfer, but I agree with you.

James Ferguson – Kaiser Permanente
Yeah. And this is Jamie. I think that's important input for developing our more detailed scenarios for requirements, is that – you know, I think we have an opportunity here in this workgroup to better define what the real requirements are for the report, including the images, in order to really accomplish the request that was given to us for image sharing.

Clem McDonald – National Library of Medicine
And just another maybe ____, that I think that the personal health record patient – model is not in the long run going to be as powerful or as useful as across clinicians, because, you know, you get the low rate of usage of personal health records. You get patients – you've got to depend on them to give the permissions. And this can be all done without that kind of complexity to get it to another doctor, especially with the new requirements in HIPAA. You know, you can send stuff to them.

James Ferguson – Kaiser Permanente
So this is Jamie, and I'm sorry to butt in, but we do have a time limit, and we do have to consider public comments. So I have to say, I really, really appreciate the discussion that we've had here so far today. Obviously, we're going to have to come back to this and have future discussion on our use cases, and further consideration of this image share activity from RSNA. But in the interest of time and the time limit that we have for this meeting, I do want to make sure that we have the opportunity to get to public comment.

MacKenzie Robertson – Office of the National Coordinator
So Jamie, would you like me to open the lines now for public comment?

James Ferguson – Kaiser Permanente
John, is that okay with you as well?

John Halamka – Beth Israel Deaconess Medical Center
Absolutely.

James Ferguson – Kaiser Permanente
Okay.

Public Comment

MacKenzie Robertson – Office of the National Coordinator
All right, Operator, can you please open the lines for any public comment?

Rebecca Armendariz – Altarum Institute
If you would like to make a public comment and you are listening via your computer speakers, please dial 1-877-705-2976 and press star 1, or if you're listening via your telephone, you may press star 1 at this time to be entered into the queue. We have no comment at this time.

James Ferguson – Kaiser Permanente
Okay.

Operator
Oh, we do have a comment Shawn Wiese.

James Ferguson – Kaiser Permanente
Okay.

Shawn Wiese – HMS
Hello. This is Shawn Wiese, HMS. Appreciate everything that you guys are doing with this. Imaging is a very complex problem. I just had a comment, maybe stage – the next stage would be working towards the index or identification that these images exist across the community, and then maybe following stages of meaningful use would actually start working the problem of transporting the images. Thank you.

MacKenzie Robertson – Office of the National Coordinator
Thank you. Are there any other public comments?

Rebecca Armendariz – Altarum Institute
We have no further comment at this time.

James Ferguson – Kaiser Permanente
Okay. I want to thank everyone for participating here today. This is clearly an important topic that we're going to come back to in future meetings, and I particularly want to thank our guest presenters and participants who were able to join us here today.

John Halamka – Beth Israel Deaconess Medical Center
Thank you.

MacKenzie Robertson – Office of the National Coordinator
Thanks, everybody.

James Ferguson – Kaiser Permanente
Thanks very much.

[Crosstalk]

James Ferguson – Kaiser Permanente
Thanks.