# MINUTES

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| **MEETING NAME** | 09-WG33: WG-33 Data Archive and Management |
| **MEETING PLACE/DIAL IN** | |
| **DATE & TIME** | Wednesday, June 10, 2020 \| 11:00 am – 12:30 pm US ET |
| **PRESIDING OFFICERS** | Matthew Bishop, UnityPoint Health<br>Keith Eklund, Healthcare Tech Solutions |

| **VOTING MEMBERS PRESENT** | | |
|---|---|---|
| | AAPM | Bevins, Nicholas |
| | Argentix Informatics | Silver, Eliot |
| | Canon medical Research USA, Inc. | O'Donnell, Kevin |
| | Canon/Vital Images, Inc. | Whitby, Jonathan |
| | Change Healthcare | Ho, Kinson |
| | DesAcc EMEA Ltd | King, Graham |
| | GE Healthcare | Nichols, Steven |
| | Grafimedia | Georgiadis, Pantelis |
| | Healthcare Tech Solutions | Eklund, Keith |
| | Laitek, Inc. | Solomon, Harry |
| | Mach7 Technologies | Ulanov, Alexey |

| **OTHERS** | | |
|---|---|---|
| | DeJarnette Research Systems | Wineke, Steven |
| | DICOM | Vastagh, Stephen |
| | Hyland Software | Ullrich, Mike |
| | Laitek, Inc. | Behlen, Fred |
| | Laitek, Inc. | Brown, Barry |

|                        |                      |
|------------------------|----------------------|
| Laitek, Inc.           | Costea-Barlutiu, Razvan |
| London Health Science Center | Aizawa, Luiz   |
| Mega Informatica Ltd.  | Fauquex, Jacques     |
| SIIM                   | Bishop, Matthew      |
| SIIM                   | Carey, Cheryl        |

| **VOTING MEMBERS ABSENT** | AAPM | Knazik, Shayna |
|------------------------|----------------------|------------------|
|                        | Ambra Health         | Ostrow, Daniel   |
|                        | Canon/Vital Images   | Dawson, Tim      |
|                        | ESR                  | Mildenberger, Peter |
|                        | Mayo Clinic          | Persons, Kenneth |
|                        | PixelMed Publishing  | Clunie, David    |
|                        | SIIM                 | Henson, Kyle     |
|                        | Varian Medical Systems | Schwere, Thomas |

**DICOM SECRETARIAT**    Anna Zawacki, SIIM

# 1 CALL TO ORDER AND REVIEW OF ANTI-TRUST RULES AND DICOM PATENT POLICY (Co-Chairs, Secretariat)

The meeting was called to order. Guidelines for Conducting NEMA Meetings were read and attendance was recorded.

# 2 REVIEW AND APPROVE AGENDA (Co-Chairs)

The agenda was reviewed and approved.

# 3 REVIEW MINUTES (Co-Chairs)

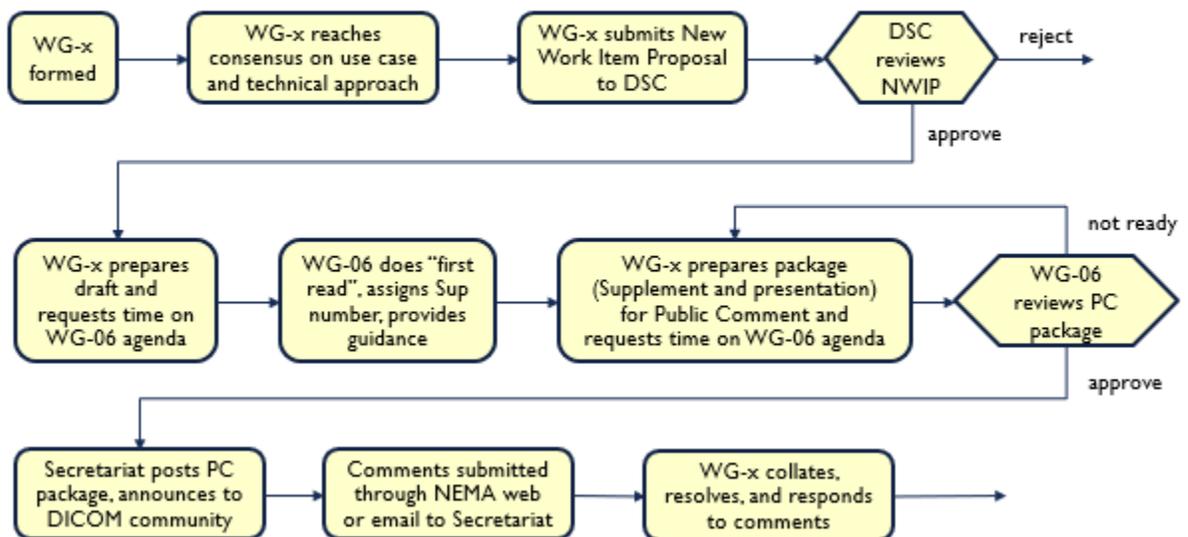The minutes of the previous meeting were reviewed and approved with 2 edits.

# 4 TOPIC ITEMS TO BE DISCUSSED (All)

- **#SIIM20**

Cheryl Carey of SIIM discussed the upcoming #SIIM20 virtual annual meeting. We have created playlists for various stakeholders within the corporations (such as R&D, C-Suite, Clinical Application Specialists, etc.) that include sessions most relevant to them. They are on siim.org but also will be disseminated to our industry partners with Cheryl's quarterly Vendor Value Prop this Thursday. #SIIM20 program will also feature the Industry Connect Sessions presented daily by our vendor partners who are platinum sponsors. These sessions will be educational in nature. With the meeting being virtual, providing the same great content, access to it for 12 months and very affordable, we are hoping you all around the world will be able to join us.
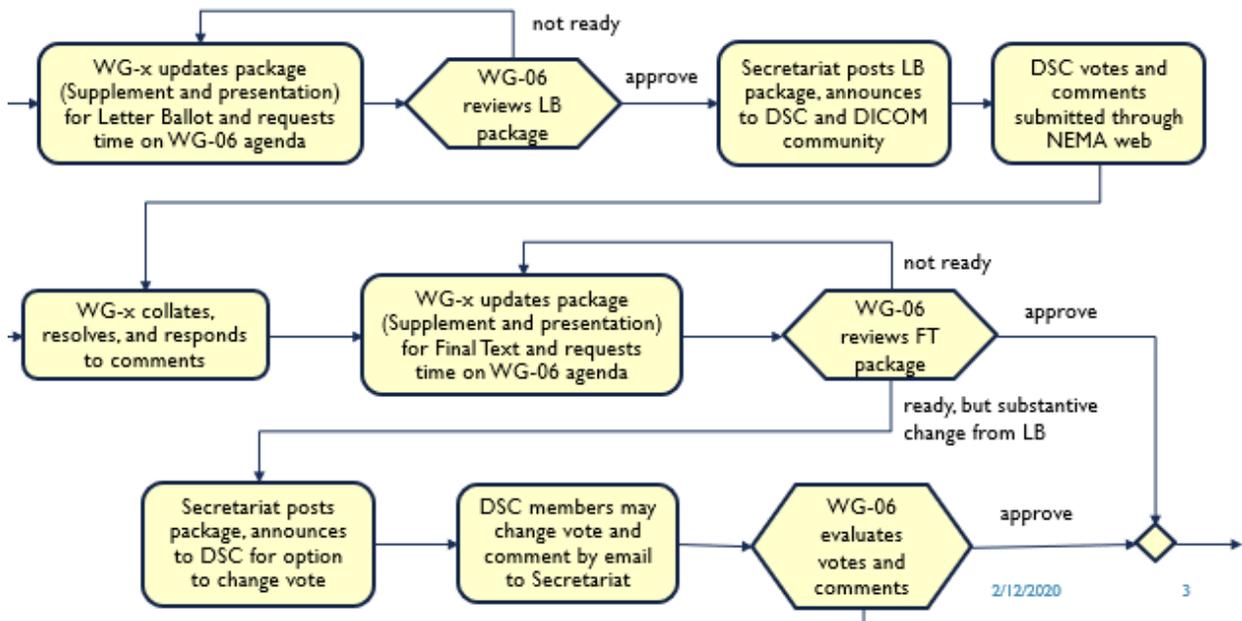
- **Discuss/Recap new Work Item proposal process**



DICOM Supplement Process – through Public Comment

## DICOM Supplement Process – Letter Ballot and Final Text

```
WG-x updates package          not ready
(Supplement and presentation)          WG-06
for Letter Ballot and requests  →  reviews LB  → approve →  Secretariat posts LB  →  DSC votes and
time on WG-06 agenda                  package                 package, announces        comments
                                                              to DSC and DICOM        submitted through
                                                              community                NEMA web

WG-x collates,         WG-x updates package                                  not ready
resolves, and responds  (Supplement and presentation)          WG-06
to comments          ← for Final Text and requests  ←  reviews FT  → approve →
                       time on WG-06 agenda                  package

                                                           ready, but substantive
                                                           change from LB

Secretariat posts      DSC members may         WG-06
package, announces  →  change vote and   →  evaluates  → approve →
to DSC for option      comment by email        votes and
to change vote         to Secretariat          comments        2/12/2020          3
```

## DICOM Supplement Process – Publication

```
DICOM Editor prepares          FT package          DICOM Editor consolidates FT
FT for publication (tags,  →  published on   →  into published DICOM
codes, section numbers)        DICOM web site       Standard (XML/PDF/MSW/etc)
```

Need to submit a new item proposal to DSC. That will be reviewed at their next meeting. If approved, then we prepare the draft, request time on the agenda of WG-6, when we get on the agenda, the first mtng will be the first read, they will give the supplement a number, they will provide guidance, we take it and prepare a package (supplement + education presentation) for public comment.

That goes back to WG-6 for several iterations until they determine it is ready for public comment. Secretariat will post public comment package to the website and give a general announcement to the DICOM community. We collate and respond to all comments, then update the package in prep for letter ballot.

We go through several iterations with WG-6 to get ready for letter ballot. It gets posted to web, announced to the DICOM community, members vote. We receive all the comments through the ballot process, we do another update in prep for the final text and again go through several iterations until the final text is ready.

When approved, it gets rolled into the publication by the DICOM Editor and published on the website, both supplement and the package get integrated into the standard.

All this process up front, means that by the time it gets to Letter Ballot, it is usually approved - benefit of dealing with WG-6 in advance.

Public comment draft is intended to be a functional, fully-fledged draft. In many cases comments are relatively minimal. Also, it's quite unusual for it to have to go through 2nd ballot.

DICOM uses continuous maintenance process, unlike HL7.

- **Harry Solomon to introduce a proposed Work Item for WG-33 to be voted on for submission to DICOM Standards Committee. Group to discuss consensus positions and open issues**

  The draft work item will be posted after today with all the changes and recommendations that will be discussed, and we need a vote from folks that this is indeed the consensus from the members of WG-33. Give folks time to fully think through this doc.

  Draft of the proposed Work Item:

## 5   New Work Item Proposal on Data Migration

Submitted by WG-33

**Introduction.**

A major use case that has evolved over the last decade is porting of a large DICOM repository from one image management system (PACS or VNA) to another. Users typically replace their PACS after ~12-15 years, often with change of vendor; replacement requires migrating historical data to the new system.  Thus, in any year, 5-10% of user organizations may be doing a PACS data migration.

A similar need for porting a repository arises when healthcare institutions merge their previously disparate PACS into an enterprise PACS. The archives from the old PACS need to be migrated to the consolidated archive. This is an increasing need with the accelerated pace of healthcare organization consolidations.

Old images are now routinely retained "forever", and data set sizes are increasing with 3D/4D and multimodality studies. Archives in many institutions now store over a billion image object instances with data volumes over one petabyte.

While the DICOM Standard makes moving data possible, there are still major performance issues in migration. PACS/VNAs are typically designed and configured to handle routine workflow data volumes, but migration data transfers can easily outstrip system capabilities. With a data transfer rate of 1 terabyte / day (quite high for even the most advanced PACS), the time to transfer a petabyte archive is 3 years. Archive migration has become a major user (PACS administrator) concern and pain point, and facilitating mechanisms are needed. Because of the broad need, a standards-based approach is required so that every migration project doesn't have to reinvent the wheel. This feels like it's starting to discuss limitations, so move it under the next heading. But it's not limitations of the standard, it's limitations of the implementation. This is a perennial implementation issue. It's a question of scaling. You sell it based on clinical needs. You don't sell it based on migration. When does the standard problem become an implementation problem?

Recognizing the opportunity for DICOM to establish standards to facilitate the process of migration, DICOM WG-33 Data Archive and Management was chartered in December 2019 and has been meeting bi-weekly since February 2020. This New Work Item Proposal represents a consensus approach among all classes of stakeholders for a set of additions to the Standard.
Let's toss in a participant count in here. DSC always wants to know what's the level of interest and it's a very healthy level – always 30+ folks on the call.

This is not just a migration use case. It's really a bulk transfer.

**Limitations of Current Standard.**

The current Standard is designed for routine daily department operational workflows, optimized for transfer of the objects for, at most, just a few studies or patients. Even media-based data exchange is specified only for the use cases of limited file sets. The use case and technical requirements for migration of a full enterprise archive data set is not addressed.
We have C-MOVE, but it doesn't work for us in part because of implementations having performance levels inadequate to this particular task, the underlying assumptions of C-MOVE are not well matched to this use case. It's the C-STORE that it's the limitation.

Also, impact of migration on the live system is an important aspect to consider, so the migration can happen without any significant impact on the system running routine tasks – good detail to mention in the introduction.in the 3<sup>rd</sup> paragraph/or new 4<sup>th</sup> paragraph – migrations may be occurring in a live environment so its impact on performance and data state need to be considered.

**Description of Proposal.**

A key requirement for migration is the ability to have an index (change the word index to inventory) of all studies, series, and instances in an archive. This is functionally equivalent to a Query (C-FIND/QIDO) that returns the entire PACS database, although Query typically has restrictions on the number of responses and requires a synchronous network protocol response – should go under the limitations section.

The Work Item will develop a Supplement to the Standard specifying an information object definition for such an index (inventory?), and a mechanism to initiate the production of the index (inventory?) that will allow it to proceed asynchronously (possibly using the Unified Worklist and Procedure Step Service – may not need to mention this, too detailed, not fundamental to the proposal but something important for people to consider). Note that there are significant use cases beyond migration for such an index, including PACS audit and quality control, and research (including machine learning) – need to connect the dots for DSC. How will it support research, quality control? We understand it can, but how will it do it? Would be useful to add a few words of explanation here. Almost want to put it under Introduction – it will be useful for migration, but also for quality control, audit, research. Need to wordsmith it in a way that our target is migration, but we believe the migration inventory will also be beneficial to these 3 areas.

Do we mention anywhere in this proposal that it pertains to migrating a DICOM object and not other things? Necessary to specify the scope – what we can and cannot migrate.
Maybe add – scope is limited to DICOM instances.
If you have a PACS that has stored CDA format reports for radiology studies, this migration may not address the migration of these reports, it may require some other mechanism to migrate those. You may utilize DICOM to encapsulate.
Are there any DICOM web services that allow reports for CDA documents in patient context? Any valid DICOM instance can be moved to the extent that it's DICOM wrapped CDA – it can be moved. There is no DICOM web query giving a CDA IOD to retrieve that document.

An archive system may optionally support the capability for direct filesystem access to DICOM Part 10 compliant files, for all or some of its stored instances. The index will provide a link to such accessible files. Because the archive may retain updates to instance metadata in its database, and not propagate them to the stored instances, the index will provide the current metadata and indications for its application to the stored instances. The Supplement will specify the means by which an implementation, either the File Set Creator (the archive) or the File Set Reader (the migration destination), may claim conformance to this file exchange capability.

The intention for the supplement is to cover media as well.

**Parts of Standard Affected.**

Part 2 may require update of the structure of Media Service conformance claims.
Part 3 will add the new index (change to inventory) IOD.
Part 4 will update the Media Service Class.
Part 6 will add new SOP Class UIDs and new attributes.
Part 10 may be updated to address the archive file exchange.
Part 11 will add one or more new Media Application Profiles for archive file exchange.
Part 12 may add one or more new shared file system Media Formats.
Part 17 may require a new informative Annex.

One of the questions that may come up – how will it relate to manifests?
IHE has things called manifests. DICOM we have our IOCM KOS document.
DICOM does not discuss manifests. It has a basic directory. Please differentiate what you are proposing from a KOS or DICOMDIR.

**Workload and Timeline.**

Drafting of the Supplement will be assigned to WG-33 Data Archive and Storage, which will coordinate as needed with WG-14 Security, WG-20 Integration of Imaging and Information Systems, and WG-27 Web Technology. Harry Solomon (Laitek) has volunteered to serve as editor. Production of the first draft is expected to take 4 months.

Because of the changes to multiple parts of the Standard and the possible need to evaluate different design decisions, it is expected that WG-06 may require up to 12 hours to review the drafts prior to release for Public Comment, 6 hours for Public Comment review and Letter Ballot preparation, and 6 hours for Final Text. This process will involve five or six WG-06 meetings, thus extending over 12-15 months. The time

required by WG-06 will be minimized by using an editor with extensive experience in writing and reviewing Supplements (including participating in developing the original media exchange standard – Supplements 1, 2, and 3).

<span style="color:red">Address the comment – it's their data. Backdoor access path.</span>
<span style="color:red">Product is responsible for making sure data is valid.</span>
<span style="color:red">We are not being prescriptive in the standard; we are being descriptive of what PACS do. They store data this way, they keep updates in the database, we provide what's in the database, we are just describing what's there. It's really inventorying.</span>
<span style="color:red">Organizational policy – who can go in and grab patient data out of the database.</span>

<span style="color:red">A very important thing here is providing a vehicle for a new system to adopt this stuff without having to bring it through their DICOM stacks one instance at a time.</span>

<span style="color:red">Adopting data blobs.</span>

## 6   OLD BUSINESS

- **WG-33 at #SIM20?**

  Decision was reached not to do any special calls during SIIM20 due to lack of time. There are several sessions with a few folks from DICOM DSC at the meeting and they will be able to mention the work of WG-33 and encourage folks to join our next call which was decided to be on July 8 30 min later than usual so at 11:30 am ET.

## 7   NEW BUSINESS

- **#SIIM20 promo – showcase "playlists" for various vendor personas**

## 8   DATE AND TIME OF NEXT MEETINGS (Secretariat)

- **T-con meetings every 2 weeks at first until end of June, then possibly change to monthly**
- **Next call is July 8, 2020 between 11:30 am and 1 pm ET**

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|---|---|
| **NEMALINK CODE** | 09-WG33 |
| **SUBMITTED BY** | Hull, Carolyn |

**SUBMITTED ON**          6/25/2020

**LEGAL APPROVAL**       Reviewed by Counsel Peter Tolsdorf on 6-29-30

**UPLOAD LOCATION**     Enter upload location.