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Preserving and Integrating Conservation Photography at the Indianapolis Museum of Art at Newfields as the 2016-2017 VRAF Intern

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Abstract
The Clowes Collection of Old Master Paintings housed at the Indianapolis Museum of Art at Newfields (IMA) includes seventy-eight works by Flemish, Spanish, English, Dutch, and Italian masters, comprising some of the museum's most important artworks. The IMA recently embarked on an interdepartmental project to create a new digital catalogue that will highlight the history of each piece. What makes this publication unique is an emphasis on the conservation history as documented in thousands of images, including X-ray, infrared, and UV photographs. In order to facilitate this project, it became necessary to bring together all conversation imagery regarding the Clowes Collection, apply appropriate metadata, create new metadata workflows for Conservation staff, and ingest the images into Piction, the museum's DAMS. Over the course of six months, the author worked collaboratively with the Conservation, Photography, and Archives department at the IMA to integrate Conservation assets into Piction. This work involved consulting multiple standards for visual resource management, building a custom schema, creating a custom controlled vocabulary, and working with the DAMS vendor, all within a set time frame.

Keywords
Digital asset management, conservation, metadata, image management, workflows, Piction

Author Bio & Acknowledgements
Rebecca Pattillo is the Metadata Librarian for Archives and Special Collections at the University of Louisville, where she serves on the Digital Humanities Working Group and the University Library's Diversity and Inclusion Advisory Group. She is also a Consulting Research Associate for the Frederick Douglass Papers Edition at Indiana University-Purdue University of Indianapolis (IUPUI). Prior, she worked in the Library and Archives Department of the Indianapolis Museum of Art at Newfields as the Ursula Kolmstetter Scholar from August 2014 to August 2015 and as the Visual Resources Association Foundation Intern from September 2016 to February 2017. Her other work experience includes the Collections Department at the Indiana Historical Society, and the National Council on Public History. She received an M.L.S. and an M.A. in Public History from IUPUI in 2016. Representative of her dual master's, she is interested in community archives, accessible and inclusive digital collections, archival labor ethics, and imparting the importance of multicultural collections to create a more accurate and inclusive historical record.

The author would like to thank the Kress Foundation and the Visual Resources Association Foundation for whom this project was possible due to their generous funding. At the 2017 Visual Resources Association annual conference in Louisville, Kentucky, the author presented the following work as the VRAF Intern at the poster session. Sharing the experience, including the successes and challenges of the project, with others in the visual resources field provided the author with invaluable professional development growth. The practical experience gained from the internship not only solidified the author's metadata skills, but gave her the opportunity to develop project management, communication, and training skills, all of which has been integral to her professional growth. She would also like to thank Samantha Norling, Tascha Horowitz, Anne Young, Annette Schlagenhauff, David Miller, Fiona Beckett, Erica Schuler, and the entire Conservation department at the IMA for their expertise and enthusiasm during this collaborative project.

The Evolution of Digital Asset Management at the IMA

The digital collections landscape at the Indianapolis Museum of Art at Newfields (IMA) has seen a significant amount of change since 2012. At that time, the museum formed a DAMS Task Force to undertake a review of their current digital asset management system (DAMS) and assess the digital asset management needs across multiple departments. The Task Force found that multiple systems serving DAMS functions were used throughout the museum: Photography relied on MediaBin, Conservation used Nuxeo, and the IMA Archives used Archon.[1] Following extensive assessment, the task force recommended that the museum implement Piction to serve as their new DAMS, with the intent to eventually migrate all of their digital assets into the new repository.[2] The Piction implementation was iterative, with one departmental collection going in at a time.

Photography was the first department to begin working with the museum's new DAMS. The museum's digital assets include official photography of artwork, exhibitions and installations, and events photography. As a key component of Photography's use of Piction for storing and accessing images of the collections, data from the museum's Collection Management System (CMS), Ke-EMu, was integrated into the DAMS to link collections data to the Photography assets.[3] This author became involved when the Archives department became the next to begin using Piction, during the Spring of 2015. Working with the IMA Archivist, Samantha Norling, a metadata map was prepared to be applied across current and future collections – keeping in mind the desire to push the collections to the Digital Public Library of America (DPLA) via Indiana Memory (the state's DPLA service hub).[4] However, the first priority for archives metadata planning was digital convergence with the permanent collection of artworks and objects. This was achieved in part through shared controlled vocabularies already in use to describe the other digital collections in the DAMS and CMS. Additionally, the archives metadata map included a field that would be populated by artwork accession numbers related to the archival material being described, allowing for the creation of links between the collections. During the metadata mapping process, we took a "think globally, act locally" approach–we wanted to create cohesion between all of the digital assets within one system, while still keeping Indiana Memory and DPLA mapping in mind.[5] Following the successful creation of both the Photography and Archives Department collections in Piction, the need arose for the next collection of assets to be added – Conservation. While the Conservation department did not need to consider mapping to DPLA, this prior experience with the archives department gave the author knowledge of how Piction could link assets to the other disparate, yet related, collections

[1] For a more detailed discussion of past DAMS utilized by the IMA, MediaBin and Nuxeo, see Tascha Mae Horowitz and Anne M. Young, "The DAM copyright conundrum." *Journal of Digital Media Management*. Vol. 3, no. 3, 2015.
[2] Piction, accessed February 19, 2018, http://www.piction.com/.
[3] For a more detailed discussion of the work implemented by the DAMS Task Force, the selection criteria of Piction, and the integration of the museum's CMS, see Anne M. Young and Tascha Mae Horowitz, "About DAMS Time! Asset Management to Streamline & Achieve Strategic Institutional Goals," *VRA Bulletin*, Vol. 43, no. 1, Article 6 (2016).
[4] Indiana Memory, accessed February 19, 2018, https://digital.library.in.gov/; Digital Public Library of America, accessed February 19, 2018, https://dp.la/.
[5] Samantha Norling, "Bringing the Archives Out of the Art Museum: Local Metadata Planning in a Global Context," in *Organization, Representation and Description through the Digital Age: Information on Libraries, Archives and Museums (Current Topics in Library and Information Practice)*, ed. Christine M. Angel and Caroline Fuchs (De Gruyter Saur, 2018).

within the DAMS. Although each department's collection used different metadata schemas, the assets were linked through the integration of the museum's CMS Ke-Emu.

Conservation Integration via VRAF Internship Award

In the summer of 2016 the author approached the IMA about applying for the 2016-2017 Visual Resources Association Foundation Internship Award to work on a project specific to visual resources, preferably with metadata.[6] The opportunity to become involved with the VRA was of great interest, particularly because of the author's career aspirations to work within an archival setting focused on digital management, metadata, and visual collections. The IMA was enthusiastic and immediately saw the opportunity to utilize the author's previous experience with the creation of the Archives metadata map to begin the task of integrating Conservation into the DAMS. The archivist was aware of the author's skills with metadata, working with visual materials in a digital environment, and understanding of DAMS, metadata crosswalks, and asset migration; skills that would be necessary for a visual resource management project of this scale.

The driving impetus for integrating Conservation into Piction, aside from digital preservation and overall asset management, was the future publication of the new Clowes Collection catalogue. Named for art collectors and donors to the museum, George and Edith Clowes, the Clowes Collection consists of over 500 works of art from the 12th to 18th centuries that comprise some of the museum's most important artworks.[7] However, there has been no new catalogue documenting the collection since 1973.[8] Slated for inclusion in the catalogue were seventy-eight works by Flemish, Spanish, English, Dutch, and Italian masters. The creation of a digital catalogue to highlight the history of each piece became an interdepartmental project involving the Curatorial, Photography, Conservation, and Archives departments. An emphasis on the conservation history of each object, as documented in thousands of images, including X-ray, infrared, and UV photographs, makes this publication unique. However, these images existed in multiple locations, had little-to-no metadata, and had not been prepared to be ingested into the DAMS. The initial tasks were to bring the assets together, clean up or apply metadata, and work with the vendor, Piction. The VRAF Internship Award provided the perfect opportunity to begin this process, with the Clowes collection digital assets serving as a test case for building the Conservation collection in Piction. After speaking with the IMA staff about the specifics of the project, the author wrote and successfully acquired the VRAF Internship Award and began the project in September of 2016.

During the preliminary stages, it was important to consider professional standards from several angles. The head of the Conservation department, David Miller, stressed the need that any new workflows and metadata comply with the American Institute for Conservation of Historic and Artistic Works standards. Utilizing a 2011 publication, *The AIC Guide to Digital Photography and Conservation Documentation*, proved to be beneficial to the creation of a new workflow that would capture all necessary metadata.[9] VRA Core standards were also taken into account because they are also utilized by a large number of museums for the description of

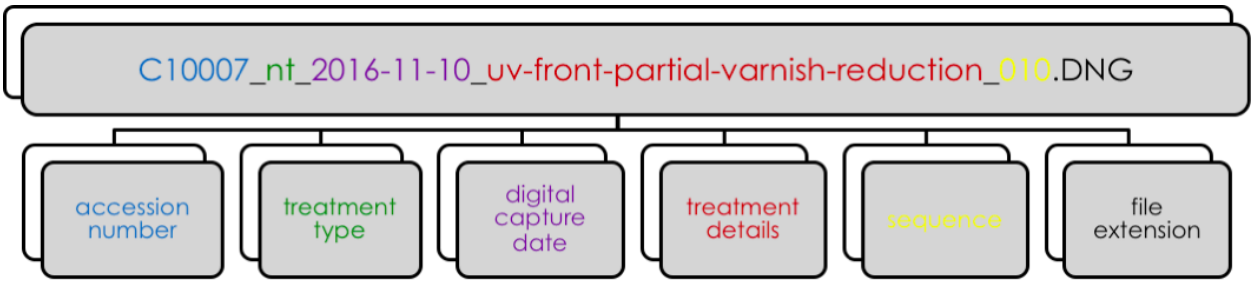
[6] Visual Resources Foundation, accessed February 19, 2018, https://vrafoundation.com/.
[7] The Clowes Collection, accessed February 19, 2018, http://www.clowesfund.org/ima/.
[8] A. Ian Fraser, *A Catalogue of the Clowes Collection*, (Indianapolis: Indianapolis Museum of Art, 1973). https://archive.org/details/catalogueofclowe00indi
[9] For more information, see: http://www.conservation-us.org/resources/our-publications/special-projects/the-aic-guide#.W6bYTxNKiCQ

artworks.[10] It was determined early on that the museum's CMS captured the same information that would be represented by VRA Core, such as artwork title, artist, style, etcetera – therefore, it would not be necessary to apply the VRA core schema to Conservation's assets because the registration information was already integrated into the DAMS. With a background in the library and archives field, the author understood the importance of utilizing controlled vocabularies and maintaining consistency in the use of metadata. This understanding of descriptive and technical metadata standards informed decisions in creating a custom schema for Conservation. Several questions led the preliminary stages of the project: How could the new workflow and schema ensure consistency? How could the workflow be easily understandable and adaptable by the conservators? What technological limitations, i.e., software/hardware, did the department have and how would it affect the workflow? What information were the conservators currently capturing about their digital images and how were they capturing it?

The first several weeks of the project were spent meeting with Conservation to determine current metadata practices and imaging workflows. Photography and Archives staff were also present at these meetings to lend advice regarding the DAMS and how to successfully connect all three collections within the system. Additionally, although the initial collection would focus on Clowes, it was essential that any metadata and workflow decisions made could be applied to all of the Conservation department's needs. This included not only paint conservators, but paper, object, and textile conservators. The department also had technical limitations and were not capable of acquiring new software for metadata creation due to budgetary constraints. Each conservator's personal computers were equipped with Bridge or Lightroom so any new workflows created would need to utilize the software they currently had and, importantly, were comfortable using.

Outdated Metadata Practices

Since 2011, the Conservation department captured treatment metadata by placing all necessary information within the file name. Naturally, this led to incredibly long file names, sometimes upwards of 80 characters long! It was quickly determined that this information could no longer be stored within the file name for several reasons. First, it created descriptive inconsistencies; while they had an established list of abbreviations to represent treatments and imaging techniques, there were inevitable variations between each conservator, thus, creating more opportunity for human error. Second, there were other treatment details the conservators wished to capture, but the file naming convention simply did not allow. Third, without embedded, controlled metadata, the full potential of Piction's search functionality would be unrealized.



[10] Information about these standards can be found at: https://www.loc.gov/standards/vracore/

Illustration 1: Breakdown of the previous file name where metadata was captured.

Once the conservators understood that they would be able to capture more data than previously, the department met collectively and created a list of all of the descriptive data they wanted represented in the new schema. Based on previous conversations with the department, understanding what data they currently captured within the file name, and what additional data they desired, it was determined to have both descriptive and technical metadata, all embedded using Bridge or Lightroom. Further, the technical metadata automatically captured during imaging, such as camera model and lens, would be mapped to specific metatags within Piction for display.

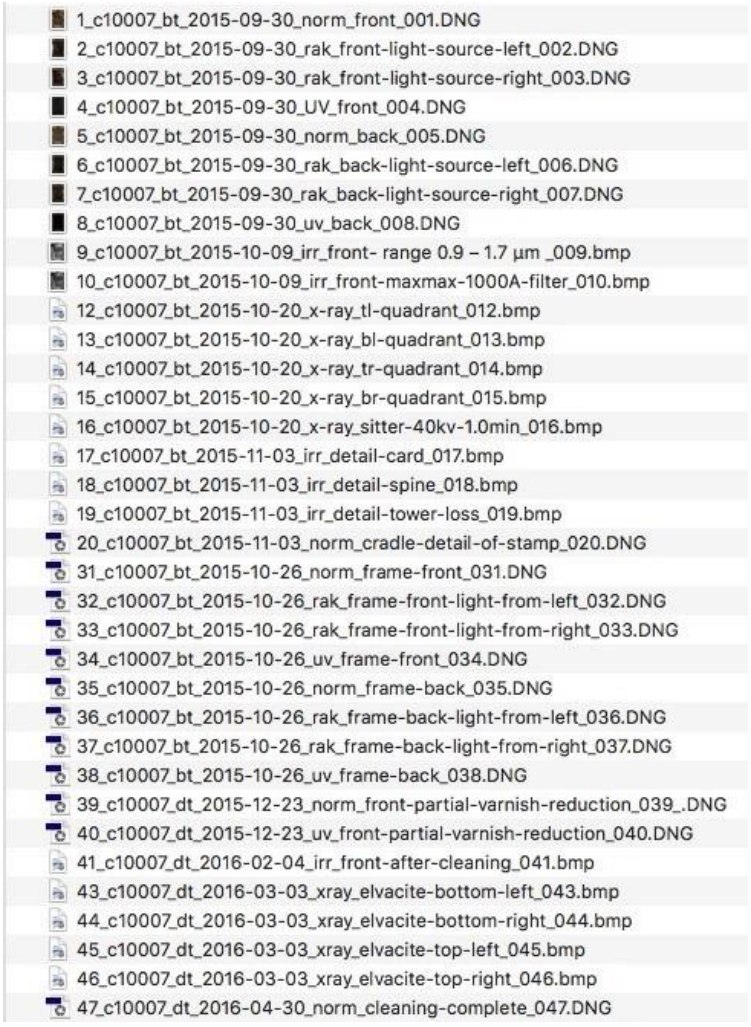


Illustration 2: Example of metadata embedded in the file name.

Metadata Cleanup

To begin work on applying the metadata that was previously captured in the file name, all of the assets had to be brought together. They were stored in multiple locations including Nuxeo, the institution's older DAMS, shared drives, and personal drives. This involved the assistance of

the museum's IT department to retrieve all of the files. After the assets were brought together and viewed within Bridge, it was discovered that some assets had additional descriptive data within the IPTC description field. The majority of the images that utilized the description field simply repeated the abbreviated treatment information that was stored in the file name, but the field occasionally captured more. It became important to check each image for any additional information not represented in the original file name. Looking at each asset within Bridge would take considerable time, therefore it was determined to use open source data tools to speed up the process. Using Exiftool, a command line application for reading, writing, and editing metadata, a CSV file of the assets was created.[11] The CSV file was then imported into OpenRefine, a web based application for examining and cleaning up large data sets.[12] Using OpenRefine's faceting capabilities made it easy to parse out the information in the file name and the IPTC description field. However, the OpenRefine documents created did not particularly speed up the process as everything could easily be viewed within Bridge and found that this document was referenced very little. In contrast, Exiftool ended up being useful throughout the project, particularly when dates within the file name did not match automatically embedded dates.

Throughout the project, the Clowes conservators were still creating new imaging. Fixity, an open source program from AV Preserve that monitors and reviews file paths and checksums, was initially set up. Examining Fixity reports helped determine when the conservators added new images to their shared drives, and whether those assets could be gathered for inclusion.[13] Fixity was working well for the first few weeks of the project, but no longer worked after IT had to replace the computer used for the project. After continued unsuccessful troubleshooting with AV Preserve, the tool had to be abandoned. Throughout the project, the Clowes conservators would email when new imaging was created, so the files could be acquired and appropriate metadata applied.

Due to the technological limitations, as well as suggested best practice from AIC, a workflow was created that utilized the department's current software by creating a controlled vocabulary using Bridge's hierarchical keyword structure (these keywords could also be imported into Lightroom). Utilizing Bridge and Lightroom's hierarchical keyword function, along with the fields that Conservation determined were essential to capture, the following treatment information served as their main metadata fields. Applying these keywords in Bridge and Lightroom is as simple as clicking a box. By using the keyword function, the fields thus became a controlled vocabulary that would be linked within the DAMS.

[11] Exiftool, accessed February 19, 2018, https://www.sno.phy.queensu.ca/~phil/exiftool/.
[12] OpenRefine, accessed February 19, 2018, http://openrefine.org/.
[13] Fixity, accessed February 19, 2018, https://www.weareavp.com/products/fixity/.

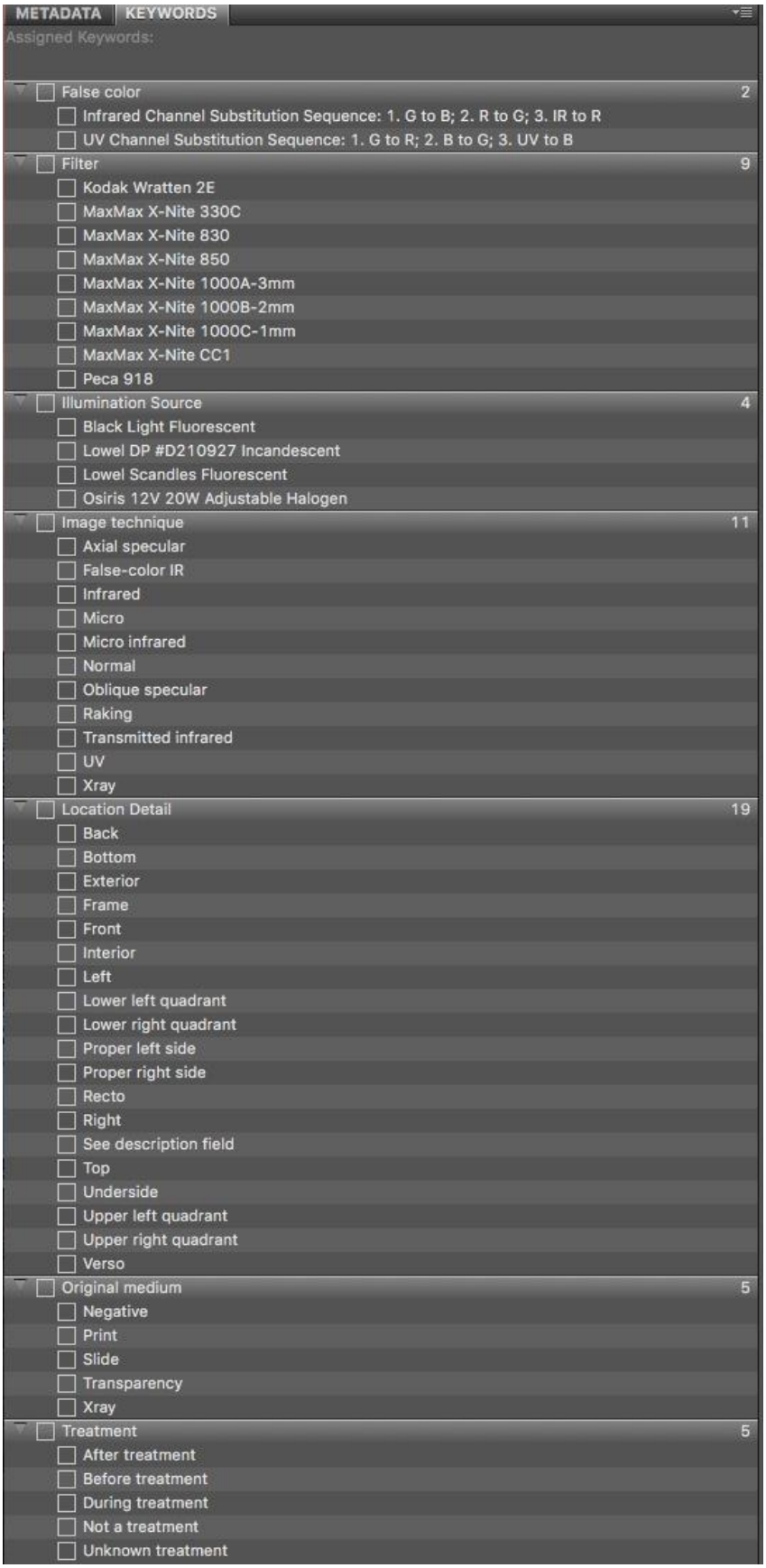


Illustration 3: View of keyword metadata in Bridge.

Once the collection was in Piction, the DAMS could be instructed to index specific metadata fields, which would link assets with shared keywords. For example, a conservator could navigate to a specific piece of art's folder within Piction, and facet their search to show all "x-rays" "after treatment." It was still necessary to apply some information via a free text field, hence the "See description field" check box. Also, information such as the "Photographer" had to be input manually within the IPTC Creator field. Again, it was necessary to create workflows that would be simple for the Conservator's, as well as eliminate human error as much as possible, therefore free text fields were kept to a minimum. Although the project specifically dealt with born-digital assets, the "original medium" field was created with forward thinking in mind, as the department hoped to eventually tackle their legacy analog images from the Clowes Collection. Any future digitization of legacy images would be able to utilize the "original medium" field to capture its original format. Another instance of forward thinking was the "see description field." When viewed in Piction, this keyword displays next to the description field, therefore it seems redundant. However, when the images are shared with researchers and art historians outside of the museum, when using Bridge or Lightroom to view the metadata, it directs them to look at the description field.

After the new schema was fully developed and all assets brought together, several weeks were spent applying the metadata from the file name using batch operations within Bridge. Once the metadata was applied, file names were changed to a more simplified version of the older file name. While the representatives at Piction suggested a much more simplified file name than the one ultimately used, it was important to the conservators that some aspects of the old file name remain.

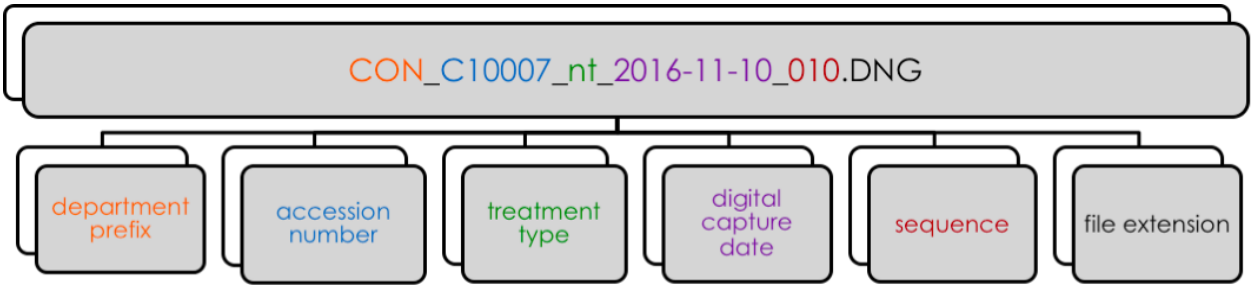


Illustration 4: Breakdown of new file name convention.

The new file naming convention began with the department's prefix, a rule that applies to all assets within Piction. Next was the artwork's accession number, followed by treatment type. The conservators were wedded to their previous file naming system and were hesitant to let go of certain aspects; the treatment type being one such instance. Additionally, some imagery with different treatment types are captured on the same date, so it became necessary to leave an identifier in the file name to discern between groups if images. The digital capture date follows the treatment type, then the sequence number for multiple images from one treatment. The main difference between the old file name and the new, was the elimination of the treatment data, which made up the bulk of the previous file name. Now that the majority of the treatment data was embedded, this could be eliminated entirely from the file name.

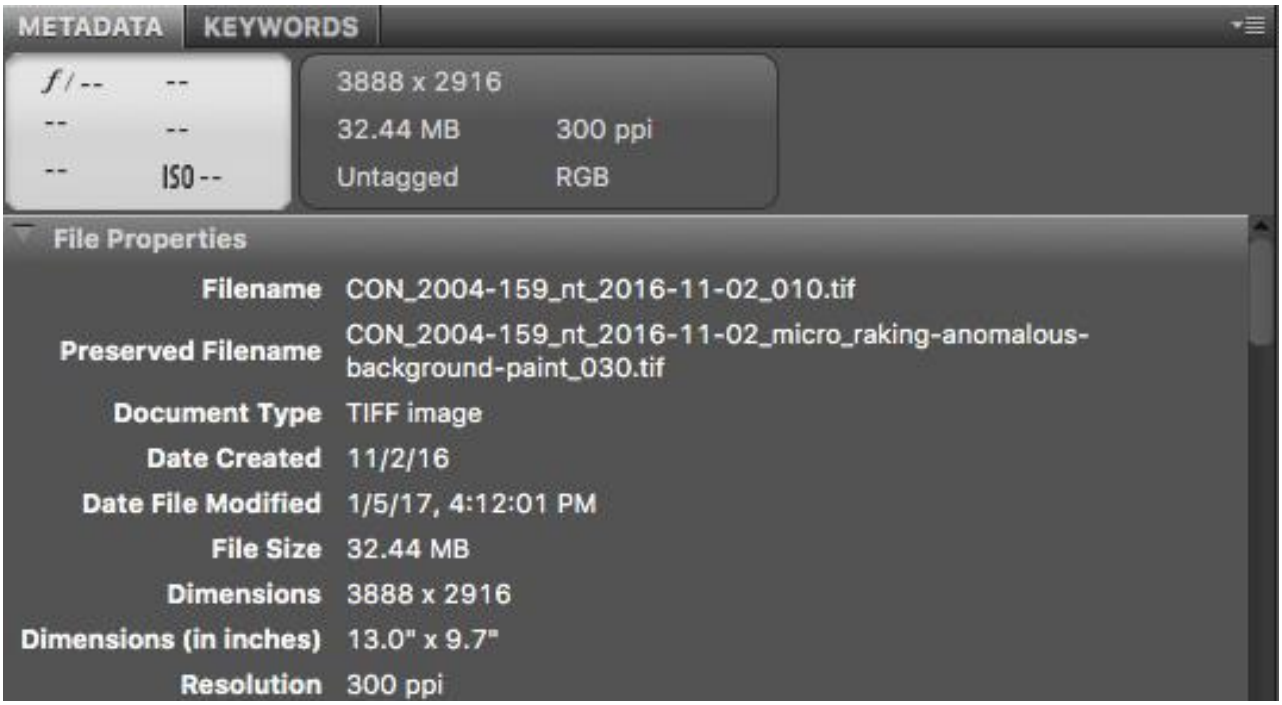


Illustration 5: Utilizing Bridge's "Batch Rename" function, the process of changing the file name was quick. Also, the original file name was preserved in the embedded metadata which is visible in Bridge or Lightroom.

Mapping the Schema

Piction metatags	Map to embedded field
IMA_CON.SPECIFICATIONS	Keywords (IPTC)
IMA_CON.PHOTOGRAPHER	Byline (IPTC) - "Creator" in Bridge
IMA_CON.ORIGINALDATE	Original Transmission Reference (IPTC) - "Job Identifier" in Bridge
IMA_CON.DIGITALDATE	Date Created (IPTC)
IMA_CON.CAMERA	Model (EXIF)
IMA_CON.LENS	Lens (XMP)
IMA_CON.DESCRIPTION	Caption (IPTC) - "Description" in Bridge
IMA_CON.TREATMENTNUMBER	Headline (IPTC)

IMA_CON.PUBLICLYAVAILABLE	Default value: NO

Illustration 6: Mapping the metadata to Piction's metatags.

Using Piction's metatag feature from the admin interface, the author was able to map specific fields for display through the user interface. The overall schema was fairly simple and small – understanding that the majority of the treatment information is within the hierarchical keywords. An unforeseen complication during the back end mapping was that some IPTC fields in Bridge have different attributions within Piction. For example, the IPTC field "Original Transmission Reference," is called "Job Identifier" in Bridge. The treatment number was also created for future use. While they currently don't assign unique treatment numbers to their individual treatments, it is a practice the department hopes to implement later on. Additionally, we created a Publicly Available field to serve as a flag in case some of the images are to be pushed to the website at a later date. This field defaults to NO, but can easily be changed to YES to indicate that an image can be published online.

Piction Display

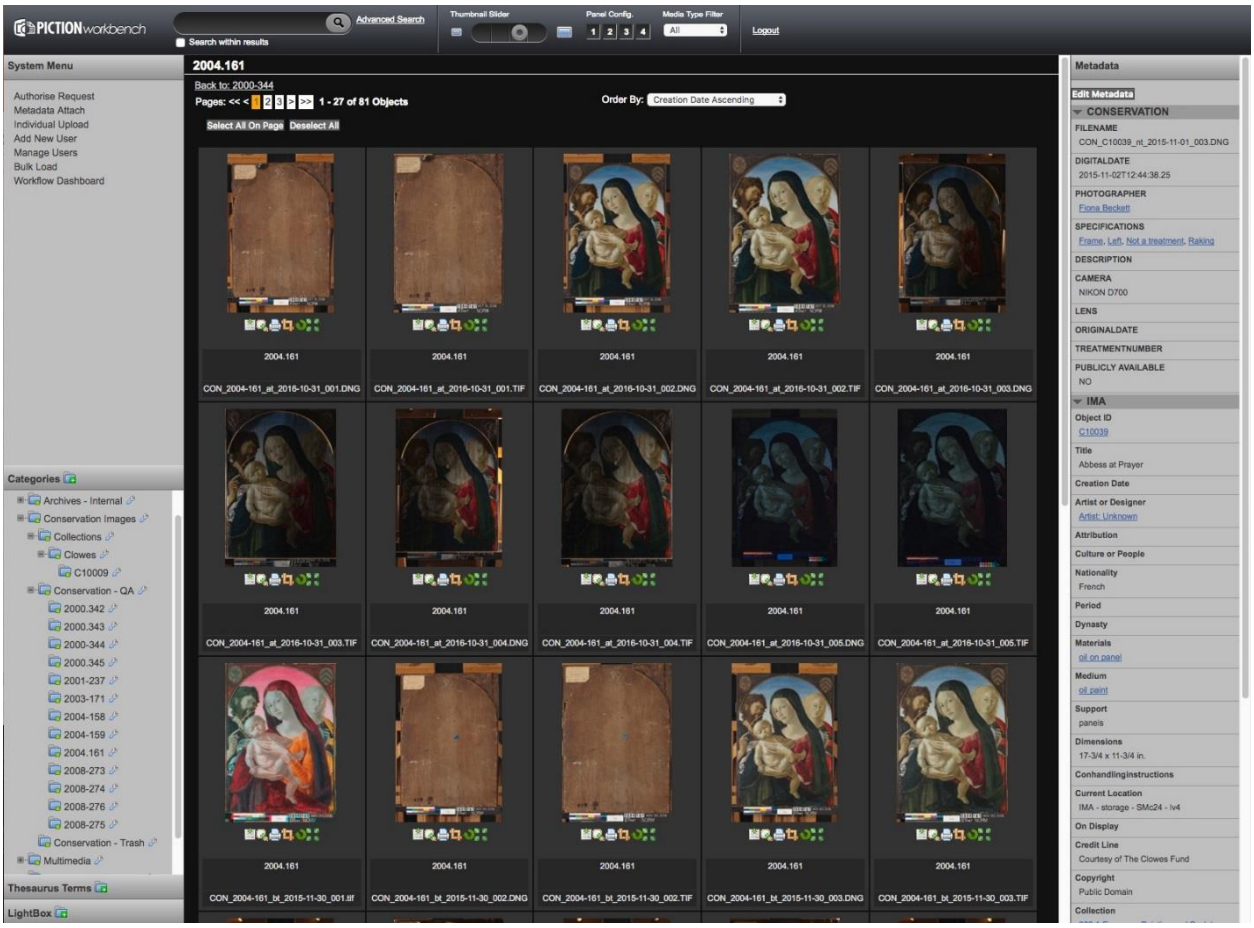


Illustration 7: Internal display of the Quality Assurance "QA" staging section in Piction.

Organizing the assets within Piction, we chose to create a Quality Assurance (QA) folder where all files would initially be uploaded for review. Once the upload was complete, the conservators check the files to ensure that the metadata looks correct before moving the assets into their respective folder within the permanent collection folders in Piction.

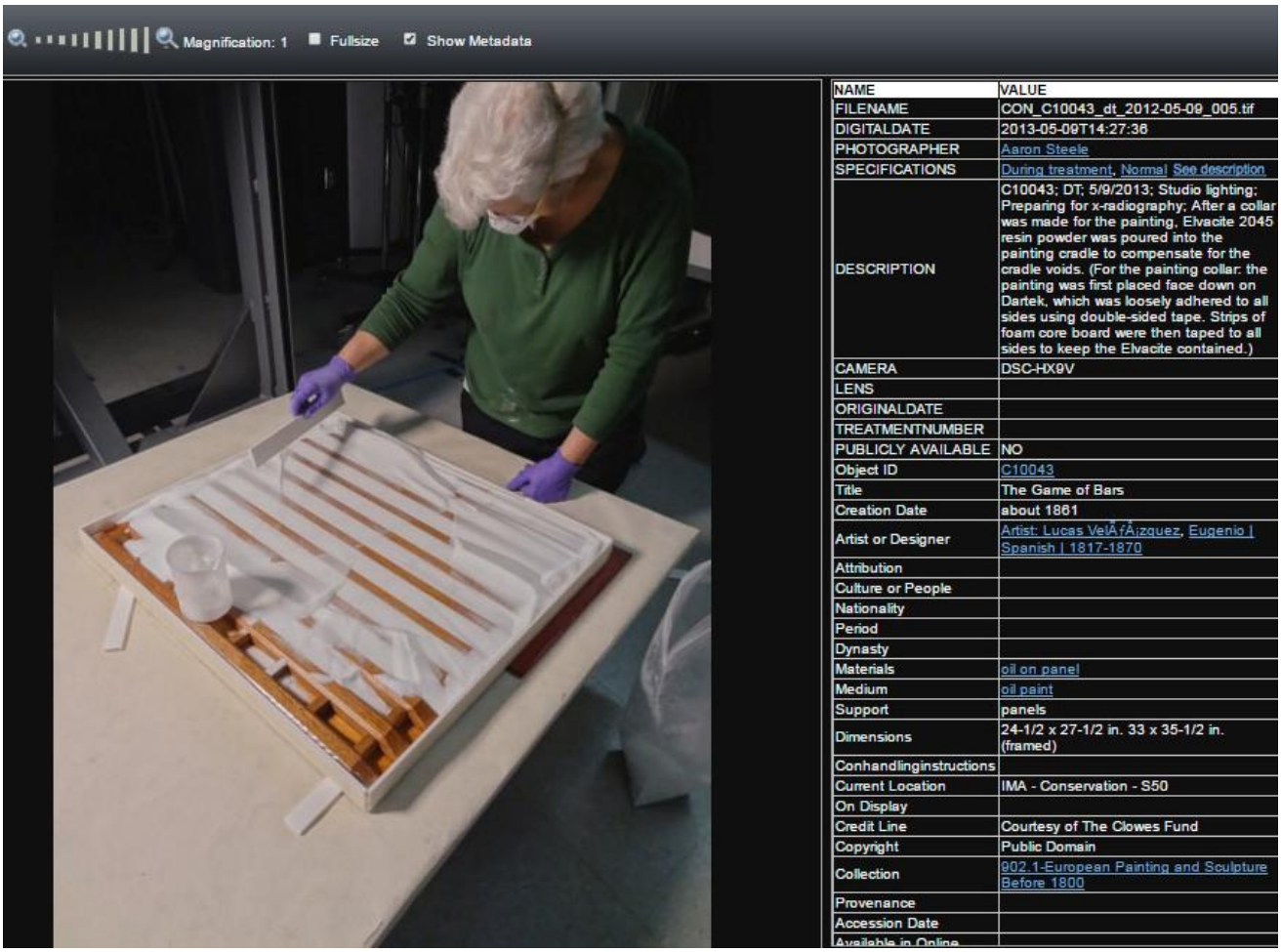


Illustration 8: Piction's user interface displays not only the Conservation specific metadata (the first ten fields), but also the integrated metadata from the CMS.

Project Management

Throughout the project, the conservators had several concerns. While they understood the concept of metadata, their understanding of descriptive standards and best practices for using metadata to link related assets was lacking. Discussion of Piction in the abstract and without demonstration made it difficult for conservators to realize the DAMS functionality and how the metadata would increase access and discovery. Their main concern was additional time added to their current imaging workflows, particularly for the two Clowes conservators who were working under time-based grant funding. Additionally, they were worried about incorrectly applying metadata, but following a live demo of the keyword functions in Bridge and how it was as simple as clicking a box, they were put at ease. Other concerns were how the images would display in the DAMS, who would have access to view and download the original assets, and what type of control they would have over the assets once ingested into Piction. A conversation

with the two Clowes conservators revealed that one of the reasons they were wary of the project was they felt they were losing control of their assets. After explaining to them, that while the author was currently embedding the metadata into their files and initially ingesting them into Piction, the assets would still be under their control; they could delete, add new files, move, and alter metadata at any time once the collection was set up in Piction. This was partially a failure on the author's part to fully explain that Piction is for managing their assets, as well as long-term preservation, but not a lockdown of those assets.

Working directly with all conservators in the department, the author also served as the liaison between the department and the Piction representatives. This communication took place during weekly phone calls with Piction and the IMA's DAMS Task Force. Throughout the process, the task force was also working on implementing document management through Piction. Time was allotted in each meeting to address the Conservation collection needs and update them on the progress. The author also communicated and shared workflow and metadata documentation via Trello, the task manager that Piction utilized.[14] Certain decisions were made based on Piction operability and linking data from the CMS. This included communicating the types of technical and descriptive metadata fields that would be displayed, including XMP, EXIF, and IPTC fields. The author communicated the asset types, as well as shared the workflows for embedding metadata that would be handed over to the Conservation department. The kind of front end display that was needed for the collection was also shared, as well as the metatags for the administrative interface.

Once the metadata had been applied to all of the assets, all metatags created, and the images were loaded into Piction, it became necessary to create detailed workflow documentation for the conservators so they could carry on following the author's departure from the project. This had to be created for both Bridge and Lightroom, as each conservator had preferences for one over the other. The author conducted multiple group and one-on-one training sessions with each conservator to set up their software with the hierarchical keywords, train them on embedding metadata, and how to do batch operations within each software to speed up their workflows. A session was held on how to ingest the assets into the DAMS using the bulk uploader that Piction built on the backend, per our specifications. A demonstration of the DAMS search functionality once the assets were loaded into Piction showed how the metadata gave them more power to view linked assets based on the treatment details, as well as how easily they could share the images with internal and external conservators and researchers.

Accomplishments

The successful completion of the VRAF Internship Award had multiple positive outcomes for the department. The Clowes images now have standardized descriptive metadata for the first time. It follows the standards set forth by conservation's ethical governing body, the American Institute for the Conservation of Historic and Artistic Works (AIC). By adding these materials to Piction, it increased access to years of conservation imagery to one of the IMA's most important collections of artwork. Additionally, the detailed documentation will encourage the conservators to utilize the new imaging workflows in all future imaging. Currently, the department applies metadata to and uploads all imagery, not only for the Clowes Collection, but for all paper, textile, and painting treatments. Storage in Piction will help to ensure long-term preservation of the important digital images that document their work. The establishment of the

[14] Trello, accessed February 19, 2018, https://trello.com/.

Conservation collection within the DAMS means that the museum can more easily share the images within the institution and with outside researchers, particularly in the creation of the new Clowes Collection Catalogue. While the catalogue is still in production, museum staff plan to utilize Piction to create a more dynamic digital publication. Storing the assets in Piction, they can utilize its API to streamline and automate the process for generating the essays that make up the digital publication. The potential to create a more dynamic, interactive catalogue would not be possible without the successful completion of integrating Conservation assets into the museum's DAMS. The publication is slated for a 2019 release date to coincide with a major Clowes exhibition at the museum.